



STANDARD PLANS

FOR INFORMATION ONLY

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8	BM-01	Bedding and Backfill for Drainage Structures (Sheet 1)	10/26/2023	5/8/2024
9	BM-01	Bedding and Backfill for Drainage Structures (Sheet 2)	10/26/2023	5/8/2024
10	CB-01	Concrete Open Top Catch Basin (12' Max. Depth)(24" x 36" Max. Pipe)(Specify Grate Type)	11/2/2000	
11	CB-02	Concrete Open Top Catch Basin (12' Max. Depth)(42" x 72" Max. Pipe)(Specify Grate Type)	11/2/2000	
12	CB-04	Precast Open Top Catch Basin (End of Line Basin)(2' Max. Depth)(15" Max. Pipe)	11/2/2000	
13	CB-05	Catch Basin Yard Drain, Open Top, 8" Max. Pipe, (1'-1" Max. Depth)(Precast or CIP)	2/6/2019	6/12/2019
14	CB-06	Catch Basin Curb Opening (42" x 72" Max. Pipe)(12' Max. Depth)(4" Mount. or 6" Barrier)	11/2/2000	
15	CB-07	R. C. Catch Basin, Curb & Gutter Opening (4" Mount. or 6" Barr.)(Max. Pipe 42" x 72")(Max. Depth 12')	11/2/2000	
16	CB-08	Dbl. Comb.-Type Catch Basin (4" mount or 6" Barr.)(Max. Pipe Parallel to Curb: 72" RCP or 84" CMP)(Max. Pipe Perpendicular to Curb: 84" RCP or 96" CMP)(Max Depth 20')	10/7/2010	
17	CB-09	Comb. Type Catch Basin (Trunk line Under Pavement)(4" mount. or 6" Barr.)(Max. Pipe Parallel to Curb: 84" RCP or 96" CMP)(Max. Pipe Perpendicular to Curb: 84" RCP or 96" CMP)(Max. Depth: 20')	10/7/2010	
18	CB-Adjust	Adjusting / Conversion of Existing Catch Basins or Manholes	10/30/2019	2/5/2020
19	CC-30-20	2' to 5' Span x 2' to 5' Height R. C. Box Culvert (Single Opening)(Obsolete-use for extensions only)	1/5/1978	
20	CC.S.M. 4-6.S.45°.1	4' x 4', 5' x 5', 6' x 6' R. C. Box Culvert (Multiple Openings)	1/11/1978	
21	CC.S.M. 4-6.S.60°.1	4' x 4', 5' x 5', 6' x 6' R. C. Box Culvert (Multiple Openings)	1/11/1978	
22	CC.S.M. 4-6.S.75°.1	4' x 4', 5' x 5', 6' x 6' R. C. Box Culvert (Multiple Openings)	1/11/1978	
23	CC.S.M. 4-6.S.90°.1	4' x 4', 5' x 5', 6' x 6' R. C. Box Culvert (Multiple Openings)	1/11/1978	
24	CC.S.M. 5.R.45°.1	5' x 4' R.C. Box Culvert (Multiple Openings)	1/5/1978	
25	CC.S.M. 5.R.60°.1	5' x 4' R.C. Box Culvert (Multiple Openings)	1/5/1978	
26	CC.S.M. 5.R.75°.1	5' x 4' R.C. Box Culvert (Multiple Openings)	1/11/1978	
27	CC.S.M.5.R. 90°.1	5' x 4' R.C. Box Culvert (Multiple Openings)	1/11/1978	
28	CC.S.M. 6-7.R. 45°.1	6' x 4', 6' x 5', 7' x 4', R.C. Box Culvert (Multiple Openings)	1/5/1978	
29	CC.S.M. 6-7.R. 60°.1	6' x 4', 6' x 5', 7' x 4', R. C. Box Culvert (Multiple Openings)	1/11/1978	
30	CC.S.M. 6-7. R. 75°.1	6' x 4', 6' x 5', 7' x 4' R. C. Box Culvert (Multiple Openings)	1/5/1978	
31	CC.S.M. 6-8.R.90°.1	6' x 4', 6' x 5', 7' x 4', 7' x 5', 7' x 6', 8' x 5', 8' x 6', R. C. Box Culvert (Multiple Openings)	1/11/1978	
32	CC.S.M. 7-8.R. 45°.1	7' x 5', 7' x 6', 8' x 5', 8' x 6' R. C. Box Culvert (Multiple Openings)	1/11/1978	
33	CC.S.M. 7-8.R. 60°.1	7' x 5', 7' x 6', 8' x 5', 8' x 6' R.C. Box Culvert (Multiple Openings)	1/5/1978	

PAGE NO.	STANDARD PLAN NUMBER	DESCRIPTION	REVISION DATE	EFFECTIVE FOR THE LETTING OF
34	CC.S.M. 7-8.R. 75°.1	7' x 5', 7' x 6', 8' x 5', 8' x 6' R.C. Box Culvert (Multiple Openings)	1/11/1978	
35	CC.S.M. 7-10.S.45°.1	7' x 7', 8' x 8', 9' x 9', 10' x 10' R.C. Box Culvert (Multiple Openings)	1/11/1978	
36	CC.S.M. 7-10.S.60°.2	7' x 7', 8' x 8', 9' x 9', 10' x 10' R.C. Box Culvert (Multiple Openings)	1/5/1978	
37	CC.S.M. 7-10.S.75°.1	7' x 7', 8' x 8', 9' x 9', 10' x 10' R.C. Box Culvert (Multiple Openings)	1/11/1978	
38	CC.S.M. 7-10.S.90°.1	7' x 7', 8' x 8', 9' x 9', 10' x 10' R.C. Box Culvert (Multiple Openings)	1/5/1978	
39	CC.S.M. 8-9.R.90°.1	9' x 7', 9' x 8', 8' x 7', R.C. Box Culvert (Multiple Openings)	1/11/1978	
40	CC.S.M. 10.R.45°.1	10' x 7', 10' x 8', 10' x 9' R.C. Box Culvert (Multiple Openings)	1/11/1978	
41	CC.S.M. 10.R.60°.1	10' x 7', 10' x 8', 10' x 9' R.C. Box Culvert (Multiple Openings)	1/11/1978	
42	CC.S.M. 10.R.90°.1	10' x 7', 10' x 8', 10' x 9' R.C. Box Culvert (Multiple Openings)	1/5/1978	
43	CC.S.S. 4-6.RS.45°.1	4' x 6' span x 3' to 6' height R.C. Box Culvert (Single Opening)	1/11/1978	
44	CC.S.S. 4-7.RS.60°.1	4' to 7' span x 3' to 6' height R.C. Box Culvert (Single Opening)	1/11/1978	
45	CC.S.S. 4-7. RS.75°.1	4' to 7' span x 3' to 6' height R.C. Box Culvert (Single Opening)	1/11/1978	
46	CC.S.S. 4-7.RS.90°.1	4' to 7' span x 3' to 6' height R.C. Box Culvert (Single Opening)	1/5/1978	
47	CC.S.S. 7-10.RS.45°.1	7' to 10' span x 4' to 10' height R.C. Box Culvert (Single Opening)	1/11/1978	
48	CC.S.S. 7-10.RS.60°.1	7' to 10' span x 7' to 10' height R.C. Box Culvert (Single Opening)	1/11/1978	
49	CC.S.S. 7-10.RS.75°.1	7' to 10' span x 7' to 10' height R.C. Box Culvert (Single Opening)	1/11/1978	
50	CC.S.S. 7-10. RS.90°.1	7' to 10' span x 7' to 10' height R.C. Box Culvert (Single Opening)	1/5/1978	
51	CC.S.S. 8-10.R.60°.1	8' to 10' span x 4' to 6' height R.C. Box Culvert (Single Opening)	1/11/1978	
52	CC.S.S. 8-10.R.75°.1	8' to 10' span x 4' to 6' height R.C. Box Culvert (Single Opening)	1/11/1978	
53	CC.S.S. 8-10.R.90°.1	8' to 10' span x 4' to 6' height R.C. Box Culvert (Single Opening)	1/11/1978	
54	CC.S.S. 12.RS.75°.2	12' x 12' R.C. Box Culvert (Single Opening)	1/11/1978	
55	CM-49	Expansion and Construction Joint for Concrete Structures	10/1/2008	1/1/2009
56	COLLAR-01	Concrete Collar Detail	5/6/2022	9/14/2022
57	CP-01	Portland Cement Concrete Pavement Details (Sheet 1)	10/13/2021	6/8/2022
58	CP-01	Portland Cement Concrete Pavement Details (Sheet 2)	10/13/2021	6/8/2022
59	CP-01	Portland Cement Concrete Pavement Details (Sheet 3)	10/13/2021	6/8/2022
60	CPR-01	Concrete Joints and Cracks Rehab	1/12/2021	8/10/2022
61	CPR-02	Patching CRCP and PCCP	4/26/2022	8/10/2022

PAGE NO.	STANDARD PLAN NUMBER	DESCRIPTION	REVISION DATE	EFFECTIVE FOR THE LETTING OF
62	CPR-03	Concrete Rehab Details	1/12/2021	8/10/2022
63	DW-01	Driveways on Curbed Roadways	8/4/2022	12/14/2022
64	DW-01	Driveways on Non-Curbed Roadways	8/4/2022	12/14/2022
65	DW-01	Turnout and Driveway Tie-In Details	8/4/2022	12/14/2022
66	EC-01	Temporary Erosion Control Details (Sheet 1)	10/1/2008	1/1/2009
67	EC-01	Temporary Erosion Control Details (Sheet 2)	10/1/2008	1/1/2009
68	FN-01	Chain Link Fence & Gates (4, 5, 6, & 7ft)	11/3/2011	6/13/2012
69	FN-02	Field and Line Type Fence (Wood Post) (Sheet 1)	11/3/2011	6/13/2012
70	FN-02	Field and Line Type Fence (Steel Post) (Sheet 2)	11/3/2011	6/13/2012
71-78	GR-201	Highway Guard Rails (Sheets 1-8)	6/13/2017	7/12/2017
79	GR-MASH-BC	Highway Guard Rail (MASH) Application for Box Culverts	1/3/2019	6/12/2019
80	GR-MASH-OFF	Highway Guard Rail (MASH) Off-System Bridge Application	1/3/2019	6/12/2019
81-91	GR-MASH-ON	Highway Guard Rail (MASH) On-System Bridge Application (Sheets 1-11)	4/13/2023	8/9/2023
92	GRR-01	Side Mount Guard Rail (For Box Culverts)	5/3/2022	10/12/2022
93	GRR-02	Top Mounted Guard Rail (For Box Culverts)	5/3/2022	10/12/2022
94	GRR-03	Anchor Block & Bridge Rail Rehabilitation for Low Concrete Post and Rail	5/3/2022	10/12/2022
95	GRR-04	Guard Rail Anchor Block Rehabilitation for Concrete Post & Rail (Alternate 1)	5/3/2022	10/12/2022
96	GRR-05	Guard Rail Anchor Block Rehabilitation for Concrete Post & Rail (Alternate 2)	5/3/2022	10/12/2022
97	GRR-06	Approach Guard Rail for Structures with Flexible Rails	5/3/2022	10/12/2022
98	GRR-07	New Jersey Barrier Rail Retrofit (For Structures Greater than 60 ft. Long)	5/3/2022	10/12/2022
99	GRR-08	New Jersey Barrier Rail Retrofit (For Structures Less than 60 ft. Long)	5/3/2022	10/12/2022
100	GRR-09	Guard Rail Rehabilitation (Flat Deck Precast Bridges)	5/3/2022	10/12/2022
101	GRR-10	Side Mounted Guard Rail for Bridges	5/3/2022	10/12/2022
102	GRR-11	Side Mounted Guard Rail (Concrete Deck with Timber Stringers)	5/3/2022	10/12/2022
103	GRR-12	Side Mounted Bridge Rail	5/3/2022	10/12/2022
104	GRR-13	Guard Rail Terminating On Brush Curb Bridge Rail	5/3/2022	10/12/2022
105	GRR-14	Guard Rail Continuous Across Brush Curb Bridge Rail	5/3/2022	10/12/2022
106	GRR-15	Guard Rail Rehabilitation (Concrete Deck)	5/3/2022	10/12/2022
107	GRR-16	Guard Rail Rehabilitation (Timber Deck)	5/3/2022	10/12/2022
108	GRR-17	Bridge Rail Rehabilitation Waskey Bridges	5/3/2022	10/12/2022
109	HS-03	Object Markers, Mileposts, and Dead End Road Installations	4/7/2014	2/11/2015

PAGE NO.	STANDARD PLAN NUMBER	DESCRIPTION	REVISION DATE	EFFECTIVE FOR THE LETTING OF
110	KG-01	Cattle Guard (Structural Steel)	10/19/1981	
111	LS-01	Typical Landscaping Layout for use with Dead End Road Installations	4/20/1978	
112	MB-01	Mailbox Installation Details (Sheet 1)	4/4/2022	8/10/2022
113	MB-01	Mailbox Installation Details (Sheet 2)	4/4/2022	8/10/2022
114-119	MC-01	Details of Grates, Grate Frames and Covers for Catch Basins and Manholes	5/25/2018	12/12/2018
120	MH-06	R.C. Manhole, Maximum Dimensions: 11'-10" x 7'-2", Maximum Depth 20'	5/18/2011	
121	MISC SPAN-COMMON	Miscellaneous Span Details: Index, Crown, Deck Placement Formwork @ Link Slab	5/12/2021	1/12/2022
122	MISC DECK-DRAIN	Miscellaneous Span Details: Deck Drains	5/12/2021	1/12/2022
123-124	MISC JOINT-NP	Miscellaneous Span Details: Sealed Expansion Joint - End Dams and Preformed Neoprene	5/12/2021	1/12/2022
125-126	MISC JOINT-SC	Miscellaneous Span Details: Sealed Expansion Joint - End Dams and Preformed Silicone	5/12/2021	1/12/2022
127	MISC JOINT-SC-P	Miscellaneous Span Details: Poured Silicone Joint	5/12/2021	1/12/2022
128	PC-01	Precast Catch Basins and Manholes	10/2/2023	3/13/2024
129	PED-01 (1 of 5)	Pedestrian Facilities: General Notes and Misc. Details	7/21/2022	12/14/2022
130	PED-01 (2 of 5)	Pedestrian Facilities: Curb Ramps and Detectable Warning Location	7/21/2022	12/14/2022
131	PED-01 (3 of 5)	Pedestrian Facilities: Typical Crossing Layouts	7/21/2022	12/14/2022
132	PED-01 (4 of 5)	Pedestrian Facilities: Detectable Warning Surfaces	7/21/2022	12/14/2022
133	PED-01 (5 of 5)	Pedestrian Facilities: Joint Details	7/21/2022	12/14/2022
134	PG-DRAIN (DOUBLE)	Double Paved Gutter Drain	9/22/2020	5/12/2021
135	PG-DRAIN (SINGLE)	Single Paved Gutter Drain	9/22/2020	5/12/2021
136	PG-DRAIN WITH SIDEWALK (DOUBLE)	Double Paved Gutter Drain with Sidewalk	9/22/2020	5/12/2021
137	PG-DRAIN WITH SIDEWALK (SINGLE)	Single Paved Gutter Drain with Sidewalk	9/22/2020	5/12/2021
138	PM-01	Centerline and Edgeline Markings	2/28/2019	8/14/2019
139	PM-02	Pavement Word and Symbol Markings for Non-Interstate Use	2/28/2019	8/14/2019
140	PM-03	Pavement Word and Symbol Markings for Interstate Use	2/28/2019	8/14/2019
141	PM-04	Auxiliary, Deceleration and Acceleration Lanes and Gore Striping Layouts	2/28/2019	8/14/2019
142	PM-05	Typical Intersection Striping Layouts	2/28/2019	8/14/2019
143	PM-06	Lane Reduction and Island Layouts	2/28/2019	8/14/2019
144	PM-07	Railway Crossing Layout	2/28/2019	8/14/2019
145	PM-08	Pedestrian/Bike Striping Layout	2/28/2019	8/14/2019
146	PM-09	Roundabout Striping Layout	2/28/2019	8/14/2019

PAGE NO.	STANDARD PLAN NUMBER	DESCRIPTION	REVISION DATE	EFFECTIVE FOR THE LETTING OF
147	PRCB-01	Precast Reinforced Concrete Box Culverts	7/20/2022	12/14/2022
148	R-CB-11	Concrete Manhole (36" x 36") (10' Max. Depth)	3/1/2011	3/1/2011
149	R-CB-11 MOD	Concrete Manhole (36" x Open Max. Pipe)(10' Max. Depth)	3/1/2011	3/1/2011
150	R-CB-36	Sanitary Sewer R.C. Manhole	10/22/2008	1/1/2009
151	R-CB-38	Concrete Open Top Catch Basin (60" x 60" Max. Pipe)(24" Max. Depth)	11/17/2008	3/1/2009
152	RCB-EXTENSION	Standard Method for Extending Reinforced Concrete Box Culverts for 90° and Skewed Crossings.	4/8/2009	7/29/2009
153	R-CP-100 REV	Alternate Load Transmission Assembly for Expansion and Dummy Joints	3/19/1984	
154	RM-01	Right Of Way Monuments	2/1/2021	5/12/2021
155	RM-37	Portable Steel Rail Cattle Guard (42# to 45# Deck Rails)	3/24/1977	
156	RM-37 Mod.	Portable Steel Rail Cattle Guard (55# Min. Deck Rails)	3/24/1977	
157-173	RS-01	Roadside Signing Standards (Sheets 1-17)	7/1/2022	12/14/2022
174	RW-01	Miscellaneous Retaining Wall Details T & L Types 2' 0" thru 6' 0' Heights	6/13/2017	7/12/2017
175	SAM-1(Sheet 1)	Metal Pipe Wall Thickness and Connecting Bands, Fill Height for Metal Pipe (Sheet 1)	10/5/2005	
176	SAM-1(Sheet2)	Metal Pipe Wall Thickness and Connecting Bands, Fill Height for Metal Pipe (Sheet 2)	10/5/2005	
177	SC-01	Typical Speed Change Lane for Interstate Highways	11/21/2005	
178	SW-01	Shoulder Wedge	10/25/2022	3/8/2023
179	SWBS-100	Steel Wire Bar Supports	3/6/2013	8/1/2013
180	TTC-00 (A)	Temporary Traffic Control, General Notes Sheet	2/7/2025	6/11/2025
181	TTC-00 (B)	Temporary Traffic Control, General Notes Sheet	2/7/2025	6/11/2025
182	TTC-00 (C)	Temporary Traffic Control, General Notes Sheet	2/7/2025	6/11/2025
183	TTC-00 (D)	Temporary Traffic Control, Layout for Placement of Road Work, Next XX Miles, and End Road Work Signs	2/7/2025	6/11/2025
184	TTC-01	Temporary Traffic Control, For Work Greater than 15 Feet From the Traveled Way	2/7/2025	6/11/2025
185	TTC-02	Temporary Traffic Control, Layout For Work Less than 15 Feet From the Traveled Way	2/7/2025	6/11/2025
186	TTC-03	Temporary Traffic Control, Layout For Lane Closures on Two Lane Roads With Two-Way Traffic Near Intersections (Flagging Operations)	2/7/2025	6/11/2025
187	TTC-04	Temporary Traffic Control, Layout For Lane Closures on Two Lane Roads With Two-Way Traffic (Flagging Operations)	2/7/2025	6/11/2025
188	TTC-05	Temporary Traffic Control, For On-Site Diversion With Two-Way Traffic	2/7/2025	6/11/2025
189	TTC-06	Temporary Traffic Control, For Lane Closures on Four-Lane Undivided Highways	2/7/2025	6/11/2025
190	TTC-07	Temporary Traffic Control, For Closure of Two Adjacent Lanes On Four-Lane Undivided Highways	2/7/2025	6/11/2025

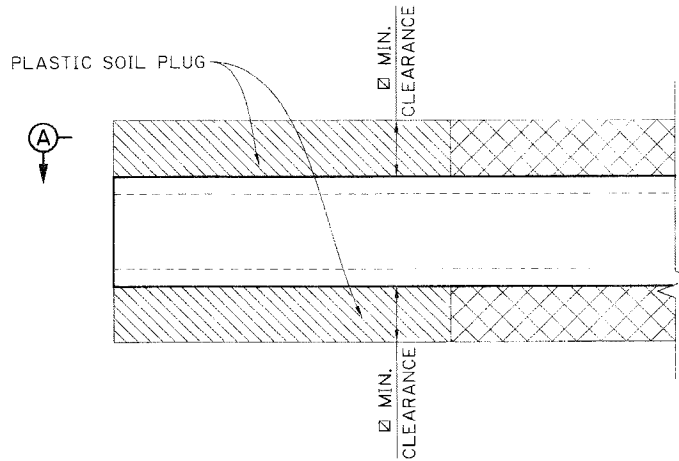
PAGE NO.	STANDARD PLAN NUMBER	DESCRIPTION	REVISION DATE	EFFECTIVE FOR THE LETTING OF
191	TTC-08	Temporary Traffic Control, For Median Crossover On Non-Interstate Divided Highways	2/7/2025	6/11/2025
192	TTC-09	Temporary Traffic Control, For Lane Closures On Divided Highways (Does not Include ramp entrance or exit tapers)	2/7/2025	6/11/2025
193	TTC-10	Temporary Traffic Control, For Lane and Sidewalk Closures In Urban Areas With Speed Limit Less Than or Equal to 40 MPH)	2/7/2025	6/11/2025
194	TTC-11	Temporary Traffic Control, For Lane Closure Using Temporary Barrier Rail On Divided Highway (Includes Freeways)	2/7/2025	6/11/2025
195	TTC-12	Temporary Traffic Control, For Lane Closures Through Ramp Entrance and Exit Tapers	2/7/2025	6/11/2025
196	TTC-13	Temporary Traffic Control, For Closure of Two Lanes on a Multi-Lane Highway	2/7/2025	6/11/2025
197	TTC-14	Temporary Traffic Control, For Louisiana Left On Interstate Highways	2/7/2025	6/11/2025
198	TTC-15	Temporary Traffic Control, For Short Duration Closing of Divided Highways	2/7/2025	6/11/2025
199	TTC-16	Temporary Traffic Control, For Road Closures	2/7/2025	6/11/2025
200	TTC-17	Temporary Traffic Control, Moving Operations for Interstate and Multi-Lane Roadways	2/7/2025	6/11/2025
201	TTC-18	Temporary Traffic Control, For Moving Operations On Two-Way Two-Lane Roadways	2/7/2025	6/11/2025
202	TTC-19	Temporary Traffic Control, For Traffic Signal Installation and Maintenance at an Intersection	2/7/2025	6/11/2025
203	WP-01	Right of Way Monument Witness Posts	2/1/2021	5/12/2021



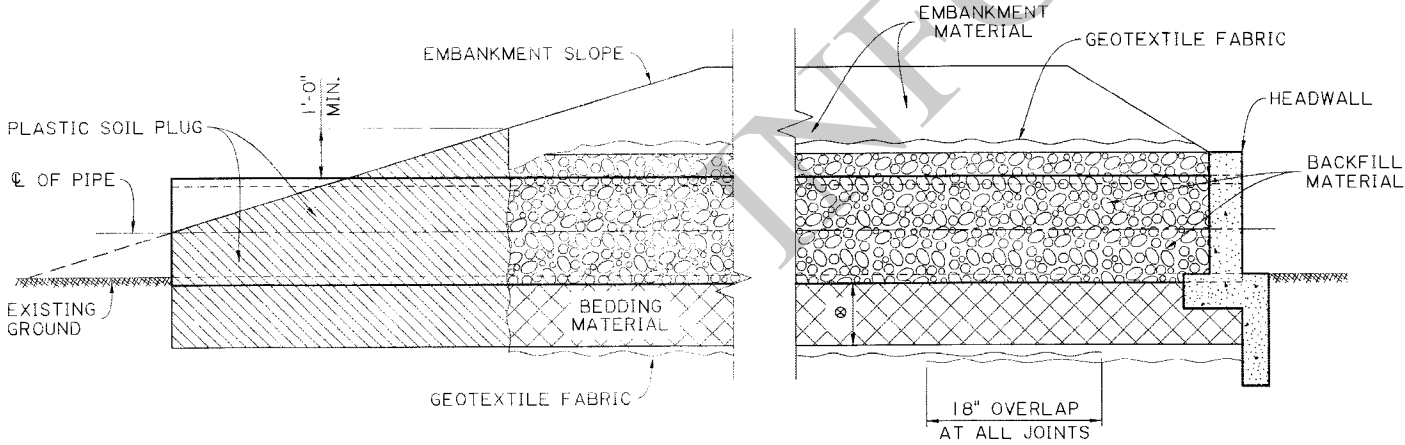
GENERAL NOTES :

1. REINFORCED CONCRETE PIPE AND FLEXIBLE PIPE ARE SHOWN AS TYPICAL STRUCTURES. DETAILS ALSO APPLY TO REINFORCED CONCRETE BOX CULVERT, REINFORCED CONCRETE PIPE ARCH, CORRUGATED METAL PIPE ARCH, AND CORRUGATED STRUCTURAL PLATE STRUCTURES.
2. CONSTRUCTION COVER REQUIREMENTS MAY EXCEED FINAL COVER.
3. CROSS DRAIN DETAILS APPLY TO ALL REACHES OF PIPE UNDER RIGID OR FLEXIBLE ROADWAYS.
4. FOR STRUCTURES INSTALLED OUTSIDE THE LIMITS OF THE ROADWAY, THE 12" OF FINAL BACKFILL ABOVE TYPE B BACKFILL UP TO THE EXISTING GROUND SHALL BE PLASTIC SOIL BLANKET MATERIAL. IF THE EMBANKMENT TO BE INSTALLED IS GREATER THAN 12" ABOVE EXISTING GROUND IN THE AREA OVER THE STRUCTURE, THEN THE PLASTIC SOIL BLANKET IS NOT REQUIRED AND TYPE B BACKFILL MAY EXTEND TO EXISTING GROUND.

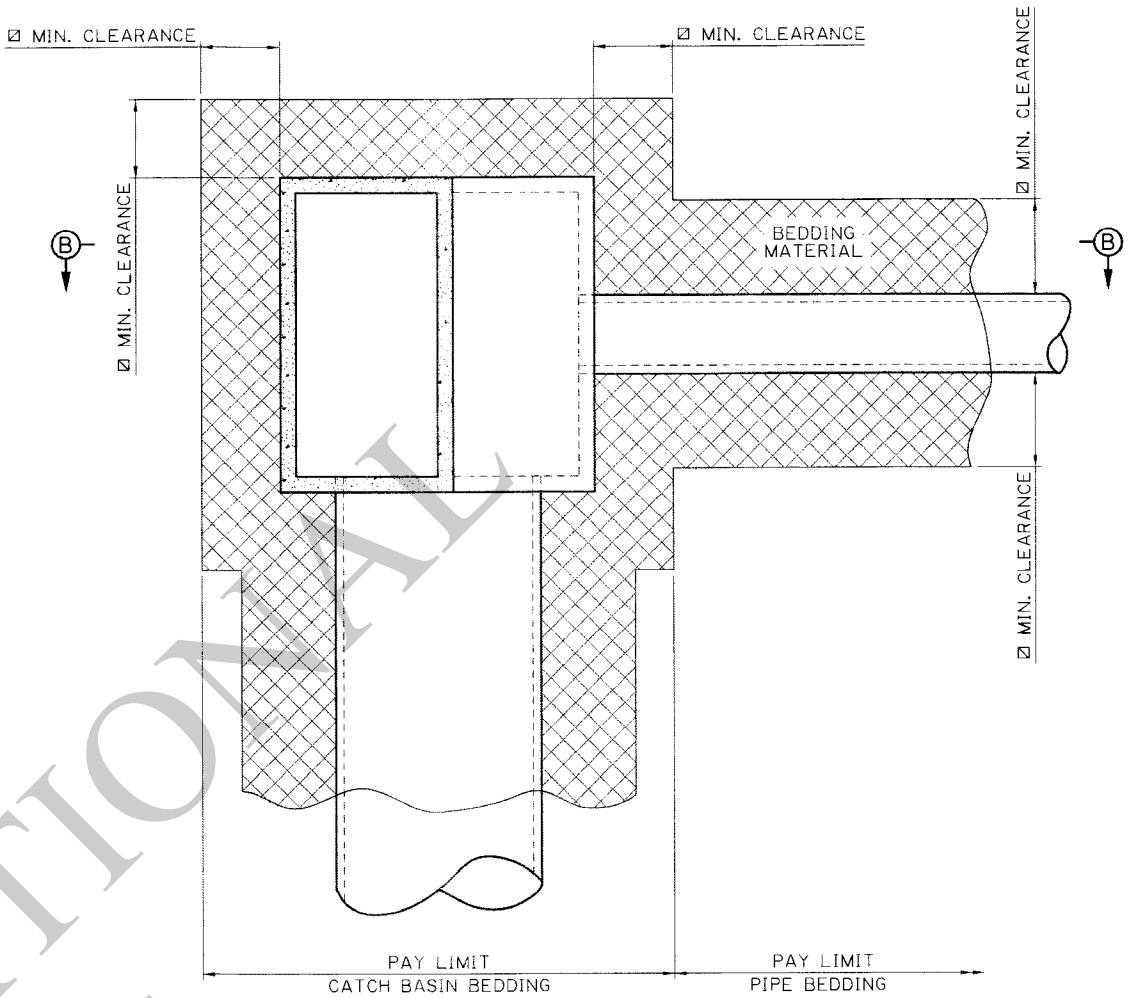
Ø MINIMUM TRENCH CLEARANCE		
TYPE OF STRUCTURE	INSIDE DIAMETER	MIN. CLEARANCE
REINFORCED CONCRETE	ALL	18"
FLEXIBLE PIPE	<48"	18"
FLEXIBLE PIPE	≥48"	24"



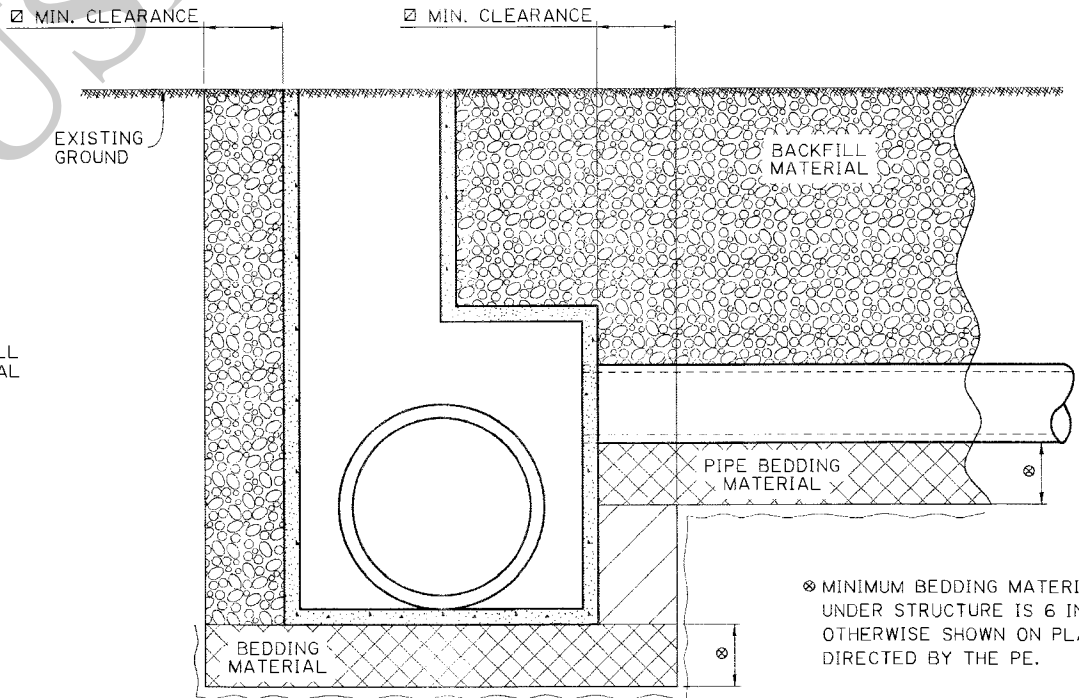
TYPICAL CROSS DRAIN INSTALLATION
WITH AND WITHOUT HEADWALL
(EMBANKMENT MATERIAL NOT SHOWN FOR CLARITY)
NTS



SECTION A-A
WITH AND WITHOUT HEADWALL
NTS



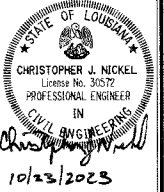
TYPICAL CATCH BASIN AND STORM DRAIN INSTALLATION
NTS



⊗ MINIMUM BEDDING MATERIAL THICKNESS UNDER STRUCTURE IS 6 INCHES UNLESS OTHERWISE SHOWN ON PLANS OR AS DIRECTED BY THE PE.

SECTION B-B
NTS

SHEET NUMBER	
DESIGN	C. NICKEL
CHECK	J. RAUSER
DETAIL	L. HASTINGS
CHECK	A. NICKEL
REVIEW	C. NICKEL
SERIES #	1 OF 2



APPROVED BY CHIEF ENGINEER:
DATE: 10/26/2023

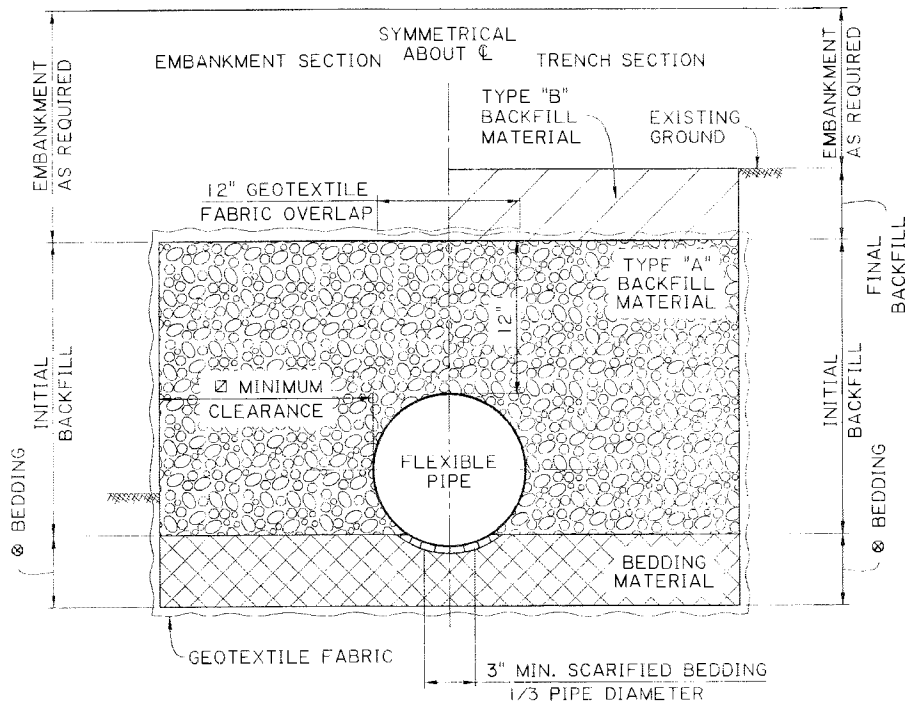


DRAINAGE STRUCTURES
BEDDING & BACKFILL

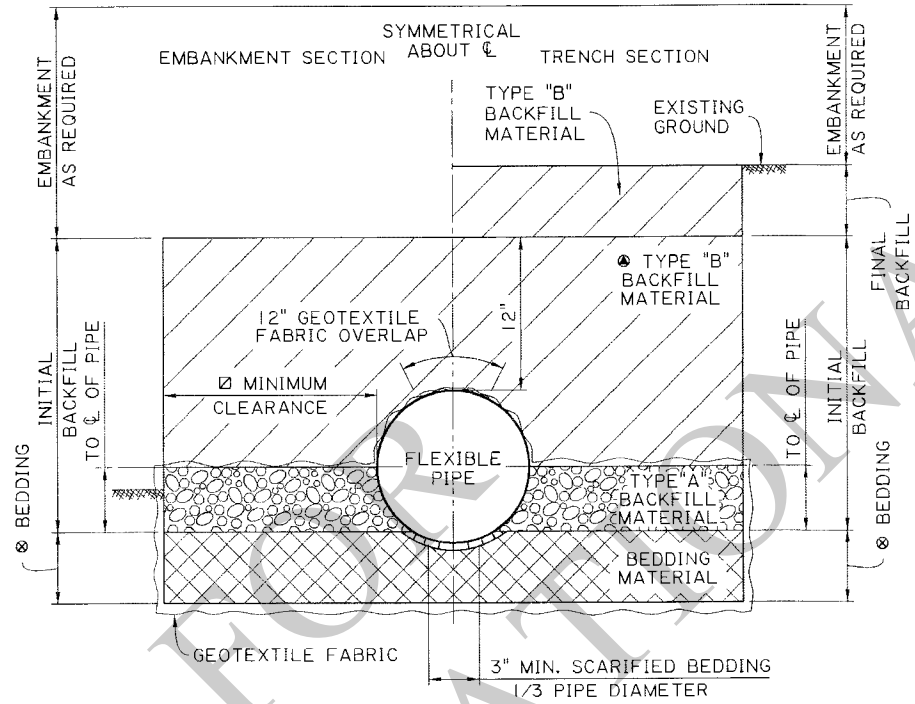




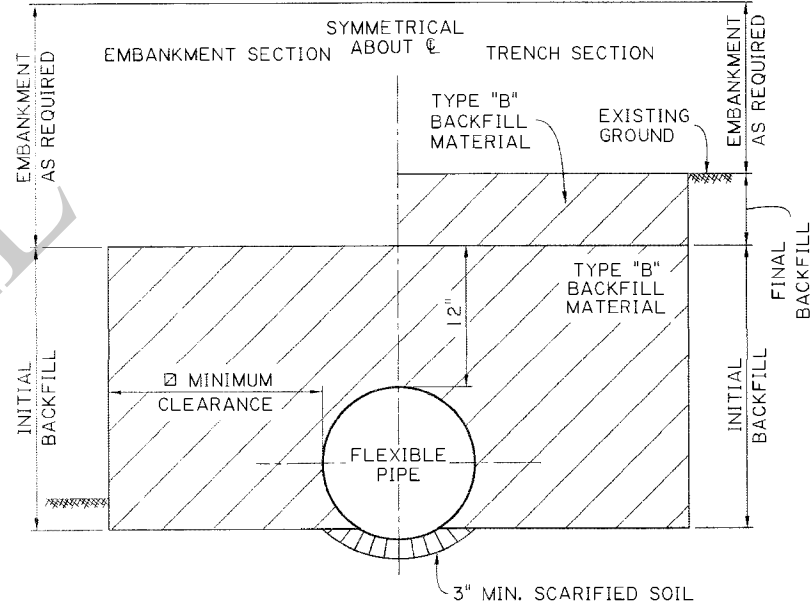
MINIMUM TRENCH CLEARANCE		
TYPE OF STRUCTURE	INSIDE DIAMETER	MIN. CLEARANCE
REINFORCED CONCRETE	ALL	18"
FLEXIBLE PIPE	<48"	18"
FLEXIBLE PIPE	≥48"	24"



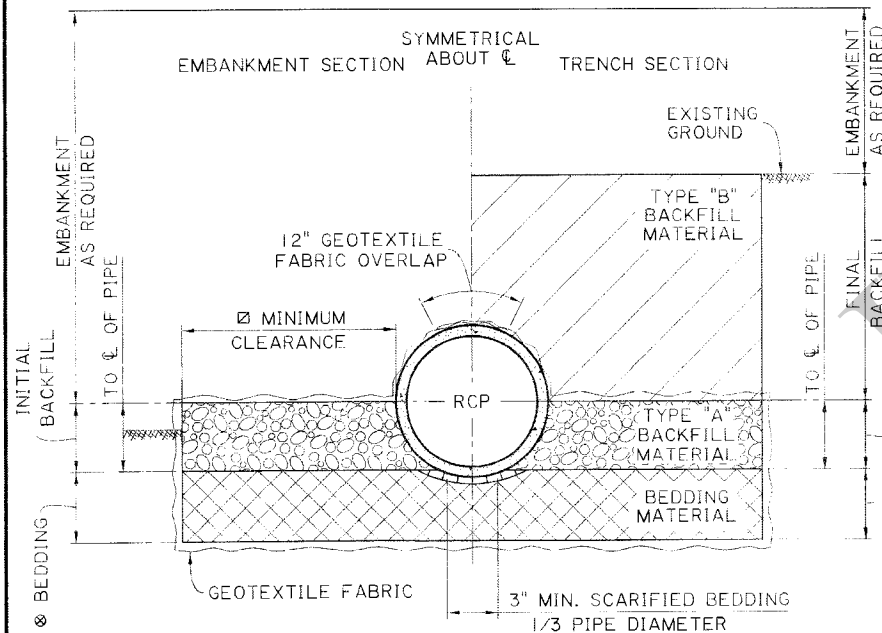
FLEXIBLE PIPE CROSS DRAIN
TRENCH AND EMBANKMENT INSTALLATIONS
SCALE: 1 1/2"=1'-0"



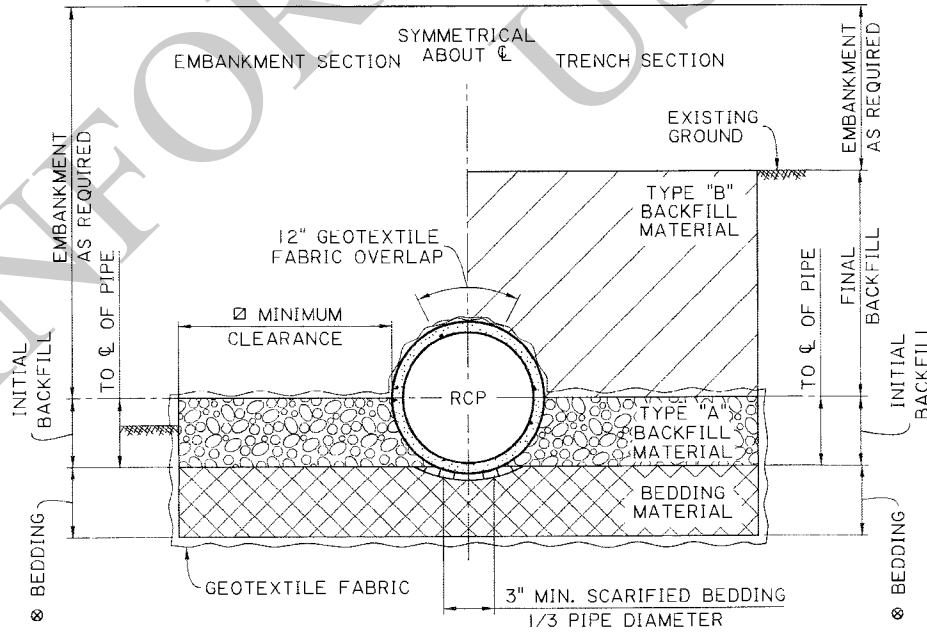
FLEXIBLE PIPE STORM DRAIN
TRENCH AND EMBANKMENT INSTALLATIONS
SCALE: 1 1/2"=1'-0"



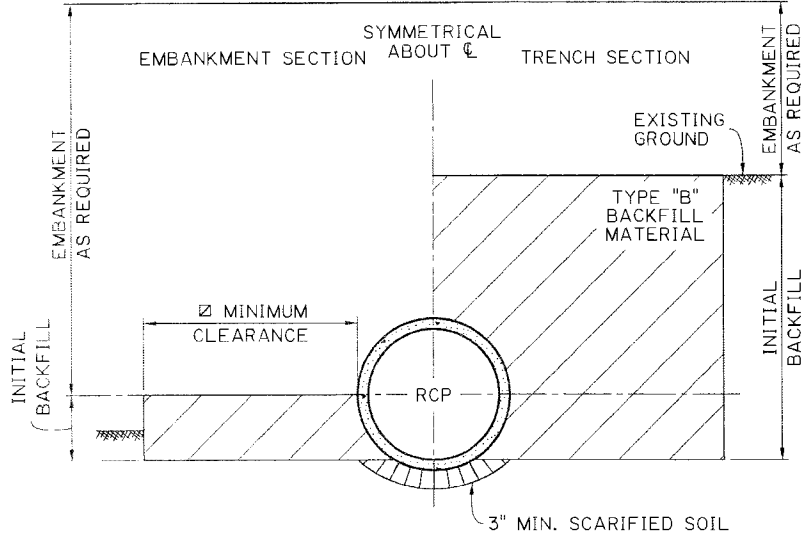
FLEXIBLE PIPE SIDE DRAIN
TRENCH AND EMBANKMENT INSTALLATIONS
SCALE: 1 1/2"=1'-0"



REINFORCED CONCRETE PIPE CROSS DRAIN
TRENCH AND EMBANKMENT INSTALLATIONS
SCALE: 1 1/2"=1'-0"



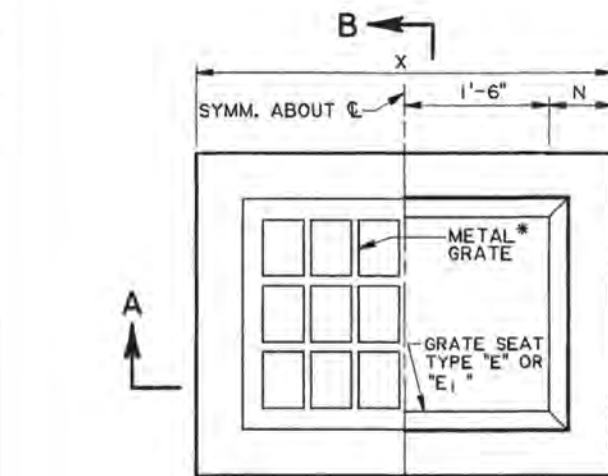
REINFORCED CONCRETE PIPE STORM DRAIN
TRENCH AND EMBANKMENT INSTALLATIONS
SCALE: 1 1/2"=1'-0"



REINFORCED CONCRETE PIPE SIDE DRAIN
TRENCH AND EMBANKMENT INSTALLATIONS
SCALE: 1 1/2"=1'-0"

- MINIMUM BEDDING MATERIAL THICKNESS UNDER STRUCTURE IS 6 INCHES UNLESS OTHERWISE SHOWN ON PLANS OR AS DIRECTED BY THE PE.
- NO BEDDING MATERIAL REQUIRED UNLESS OTHERWISE SPECIFIED ON THE PLANS OR AS DIRECTED BY THE PE.
- REFER TO NOTE 3 ON SHEET 1 OF THIS SERIES.

SHEET NUMBER		PARISH		CONTROL SECTION		STATE PROJECT	
DESIGN	C. NICKEL	CHECK	J. RAUSER	DETAIL	L. HASTINGS	REVIEW	C. NICKEL
SITE OF LOUISIANA				IN CIVIL ENGINEERING			
CHRISTOPHER J. NICKEL				10/23/2023			
PROFESSIONAL ENGINEER				10/26/2023			
APPROVED BY CHIEF ENGINEER:				DATE:			
STATE OF LOUISIANA				STANDARD PLAN			
DRAINAGE STRUCTURES				BM-01			
TYPICAL SECTIONS FOR CROSS DRAINS & SIDE DRAINS				DOTD			
LOUISIANA DEPARTMENT OF TRANSPORTATION & DEVELOPMENT				PAVEMENT & GEOTECHNICAL SERVICES			



PLAN

* GRATE TO BE TYPE "B" OR "C"
TYPE "B" SHOWN.

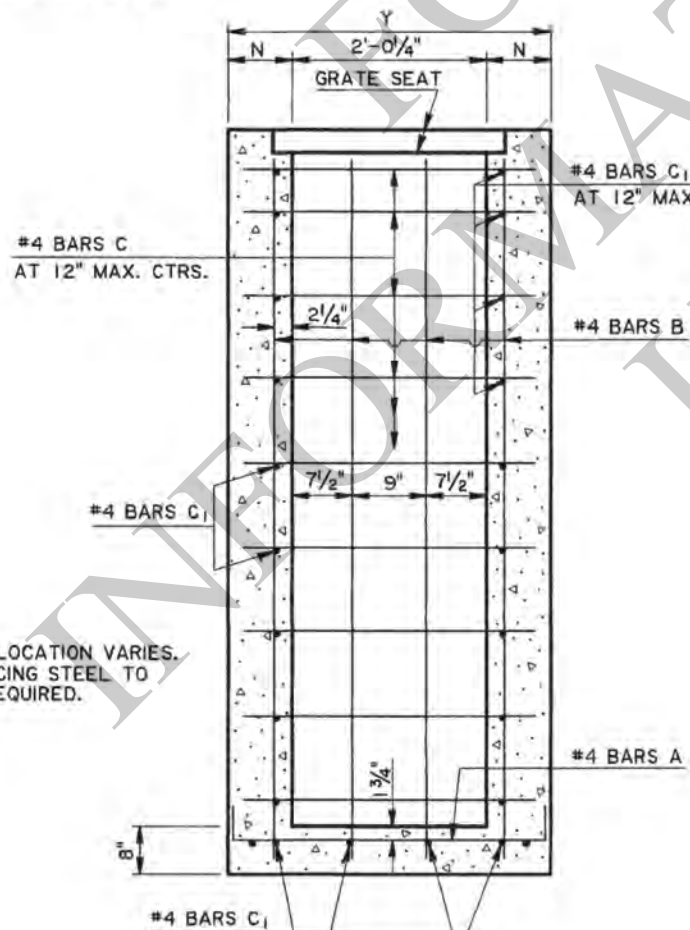
NOTE: TYPE "B" GRATE TO BE USED
WHERE NO PEDESTRIAN TRAFFIC
IS EXPECTED.

TYPE "C" GRATE TO BE USED
WHERE PEDESTRIAN TRAFFIC IS
EXPECTED.

HORIZONTAL SECTION
SHOWING BOTTOM SLAB REINFORCING STEEL

HORIZONTAL SECTION

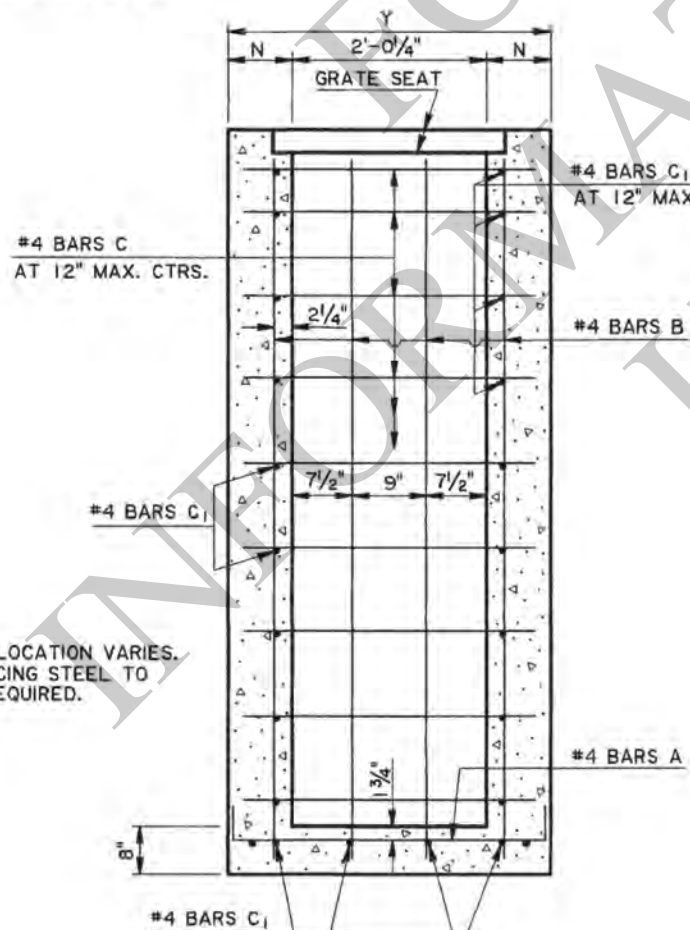
SHOWING BOTTOM SLAB REINFORCING STEEL



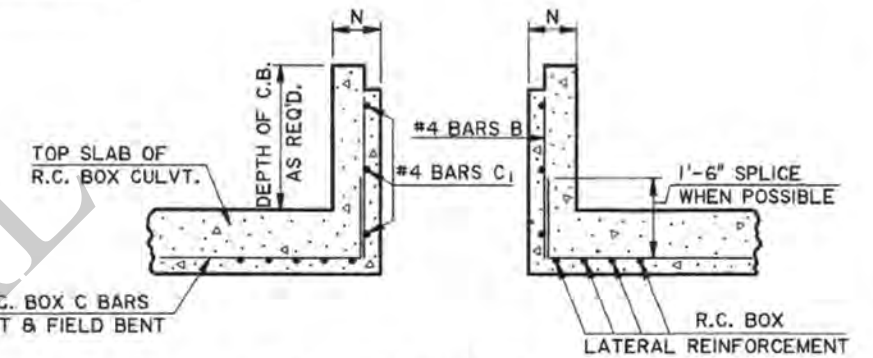
SECTION A-A

NOTE: PIPE SIZE & LOCATION VARIES.
CUT REINFORCING STEEL TO
CLEAR, AS REQUIRED.

SECTION B-B

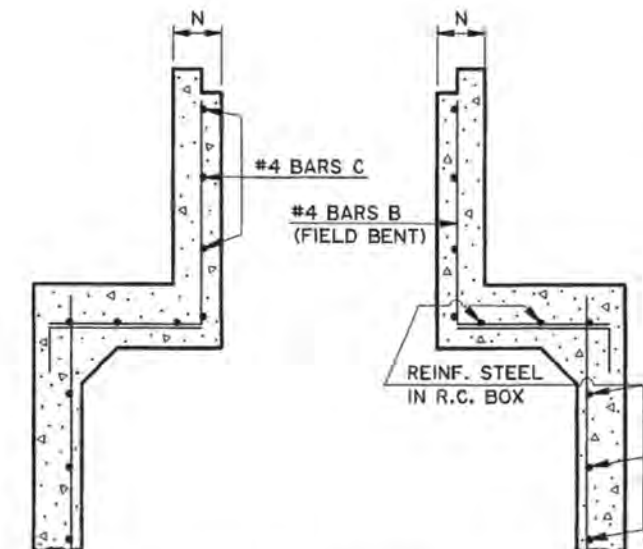


DIMENSIONS			
DEPTH OF BASIN	N	X	Y
FT.	IN.	FT.- IN.	FT.- IN.
0 - 8	7	4-2	3-2 1/4
8.1 - 12	8	4-4	3-4 1/4



LONGITUDINAL SECTION

SHOWING CATCH BASIN
USED WITH R.C. BOX CULVERT.



TRANSVERSE SECTION

SHOWING CATCH BASIN
USED WITH R.C. BOX CULVERT.

GENERAL NOTES:

SECTION 702 OF THE CURRENT DOTD STANDARD
SPECIFICATIONS SHALL APPLY.

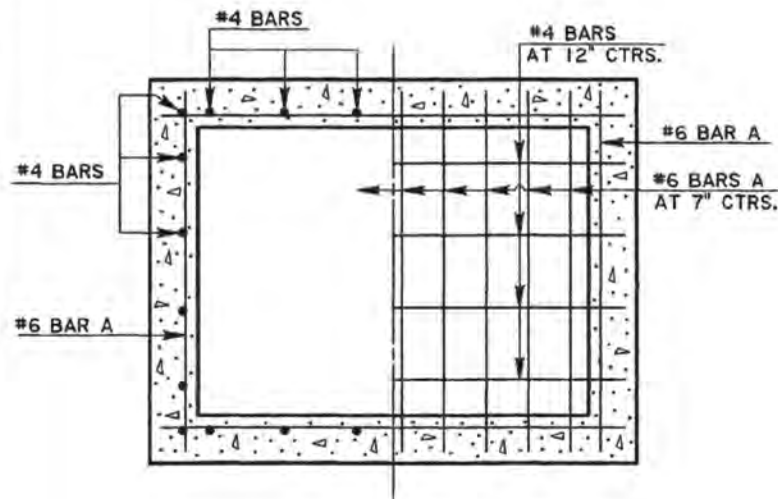
DIMENSIONS RELATING TO REINFORCING STEEL ARE
TO BAR CENTERS.

VERTICAL REINFORCING STEEL MAY BE SPLICED. SPLICE
LENGTH IS 35 DIAMETERS.

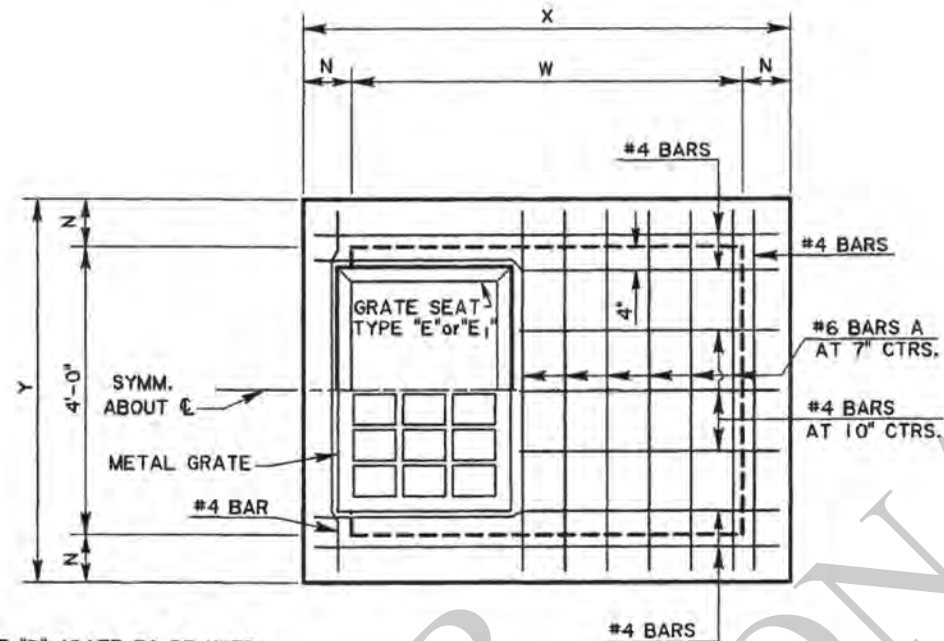
FOR DETAILS OF GRATE AND SEAT, SEE STD. PLAN MC-01
(TYPE B or C).

SEE PLANS FOR TYPE OF GRATE TO BE USED FOR
EACH CATCH BASIN.

SHEET NUMBER		PARISH		FEDERAL PROJECT		STATE PROJECT	
DESIGNED	CHECKED	PAA	KAJ	WNR	DATE	1-31-97	SHEET 1 OF 1
11-2-00				Converted Metric CB-01M to English CB-01			
DATE				REVISION DESCRIPTION			
APPROVED BY				DATE			
CHIEF ENGINEER				DATE			
CONCRETE OPEN TOP CATCH BASIN				Max. Pipe: 36" x 24"			
Max. Depth: 12'				To Be Used In Conjunction With Std. Plan MC-01			
REVISION				PLAN			
CB-01				HYDRAULICS SECTION			



**SECTIONAL
PLAN**
(SHOWING BOTTOM SLAB & WALLS)

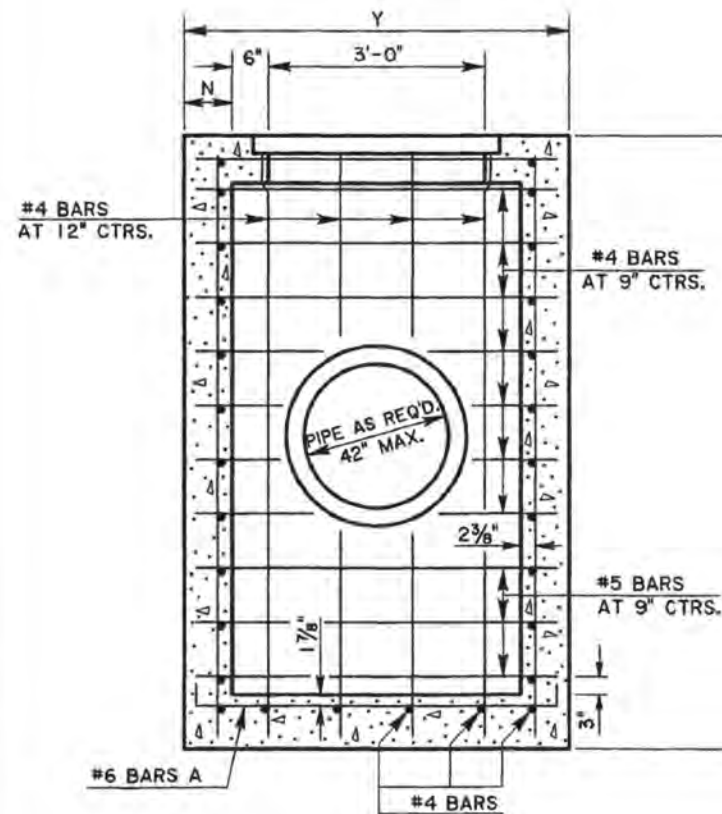


NOTE: TYPE "B" GRATE TO BE USED
WHERE NO PEDESTRIAN TRAFFIC
IS EXPECTED.
TYPE "C" GRATE TO BE USED
WHERE PEDESTRIAN TRAFFIC
IS EXPECTED.

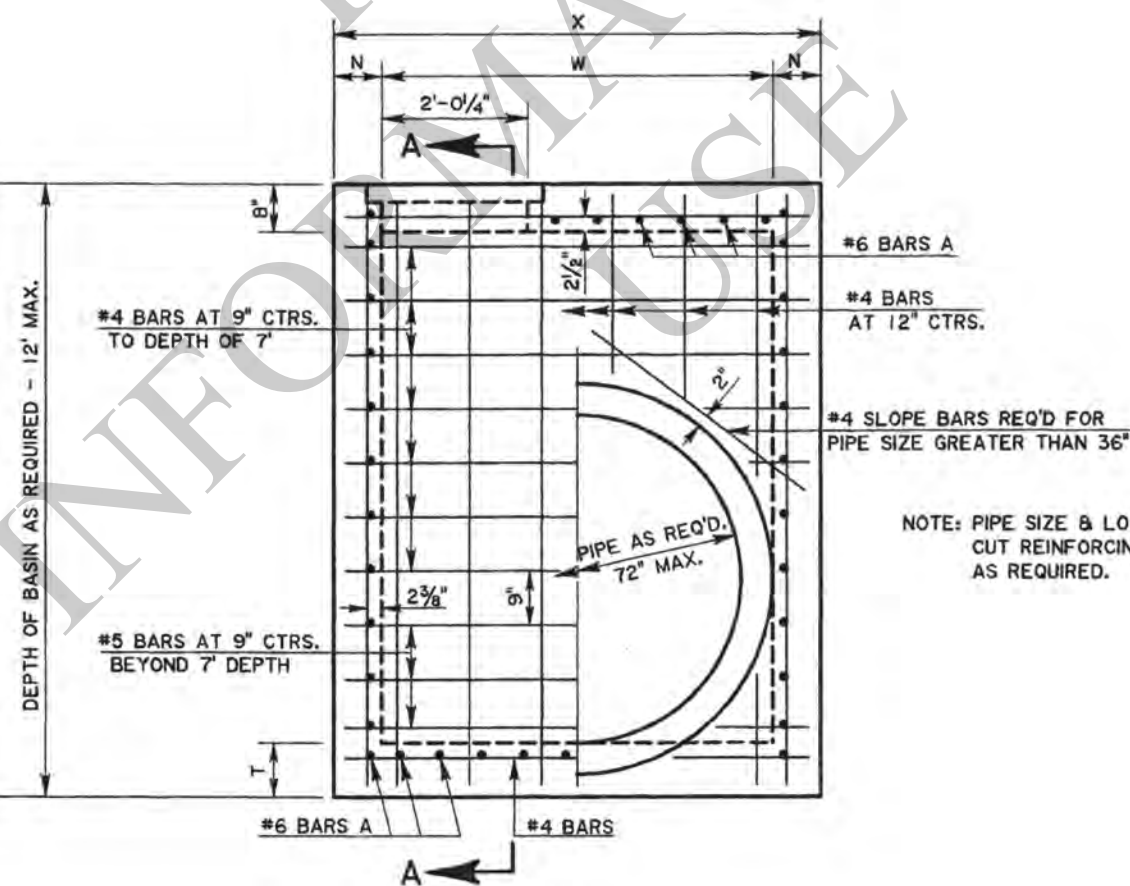
PLAN
GRATE TO BE TYPE "B" or "C".
TYPE "B" SHOWN.

TRUNK PIPE	DIMENSIONS									
	DEPTH TO 8'					DEPTH 8' TO 12'				
	N	T	W	X	Y	N	T	W	X	Y
42	7	9	4-3	5-5	5-2	8	9	4-3	5-7	5-4
48	7	9	4-10	6-0	5-2	8	9	4-10	6-2	5-4
54	7	9	5-5	6-7	5-2	8	9	5-5	6-9	5-4
60	7	10	6-0	7-2	5-2	8	10	6-0	7-4	5-4
66	7	10	6-7	7-9	5-2	8	10	6-7	7-11	5-4
72	7	10	7-2	8-4	5-2	8	10	7-2	8-6	5-4

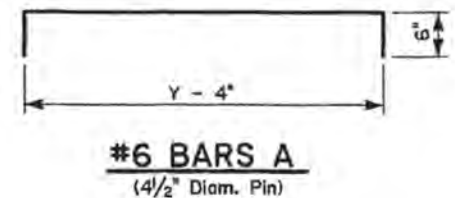
NOTE: X AND W DIMENSIONS MAY BE VARIED FOR SKEWED PIPE,
BUT W SHALL NOT EXCEED 7'-2".



SECTION A-A



NOTE: PIPE SIZE & LOCATION VARIES.
CUT REINFORCING STEEL TO CLEAR,
AS REQUIRED.



GENERAL NOTES:

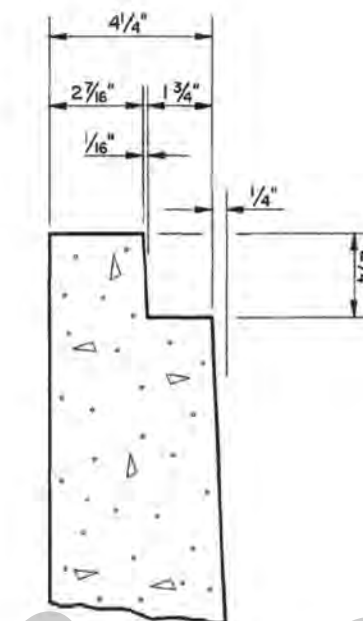
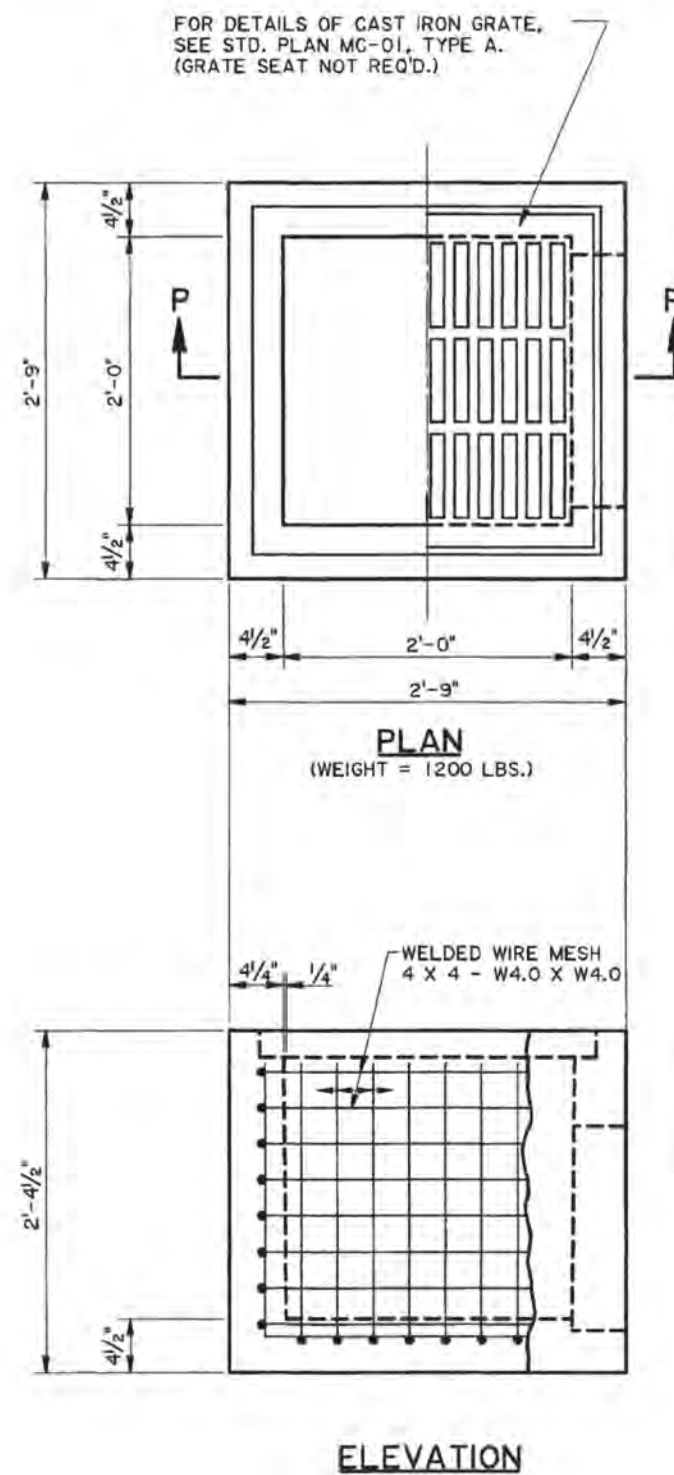
SECTION 702 OF THE CURRENT DOTD STANDARD
SPECIFICATIONS SHALL APPLY.

DIMENSIONS RELATING TO REINFORCING STEEL ARE
TO BAR CENTERS.

VERTICAL REINFORCING STEEL MAY BE SPLICED.
SPLICE LENGTH IS 35 DIAMETERS.

FOR DETAILS OF GRATE AND SEAT, SEE STD. PLAN
MC-01 (TYPE B or C).

SEE PLANS FOR TYPE OF GRATE TO BE USED FOR
EACH CATCH BASIN.



DETAIL A
ALL DIMENSIONS TYPICAL

GENERAL NOTES:

ALL CONCRETE TO BE CLASS "P".

SETTING TOLERANCE TO BE +0 & -1".

WELDED WIRE MESH TO BE OVERLAPPED A MINIMUM 3" FOR SPLICE.

OPENING TO MATCH TYPE OF PIPE SPECIFIED ON
PLAN/PROFILE OR SUMMARY OF DRAINAGE STRUCTURES.

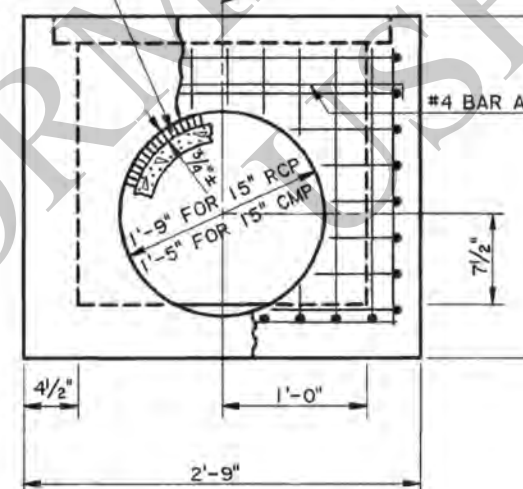
THE MANUFACTURER SHALL BE RESPONSIBLE FOR THE PLACEMENT OF ALL PICK-UP AND HANDLING DEVICES.

AFTER PLACEMENT OF PIPE, THE OPENING AROUND PIPE SHALL BE FILLED WITH FLEXIBLE PLASTIC JOINT MATERIAL.

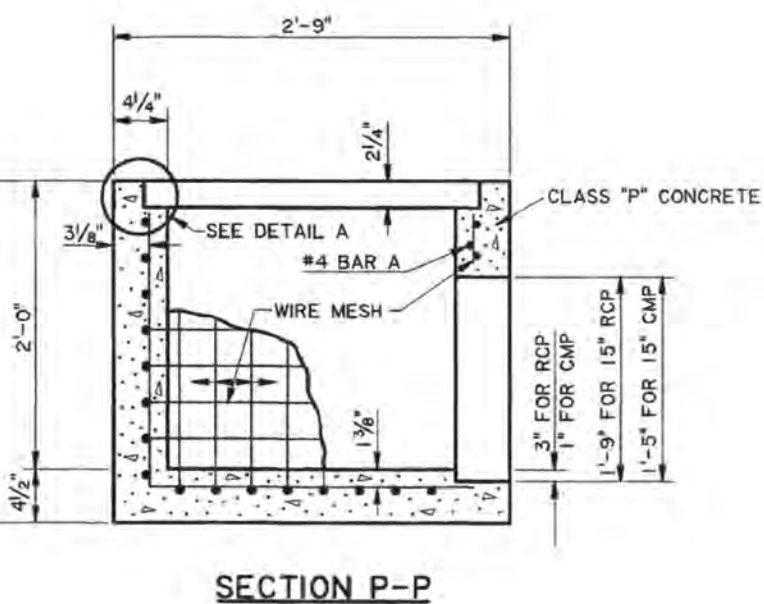
DIMENSIONS RELATING TO REINFORCED STEEL ARE TO BAR CENTERS.

FLEXIBLE PLASTIC
JOINT MATERIAL

— SYMM. ABOUT $\odot$



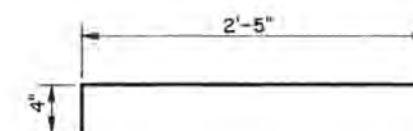
END ELEVATION



SECTION P-P

NOTE: 4 1/2" UNIFORM WALLS MAY BE USED
AT SUPPLIER'S OPTION.

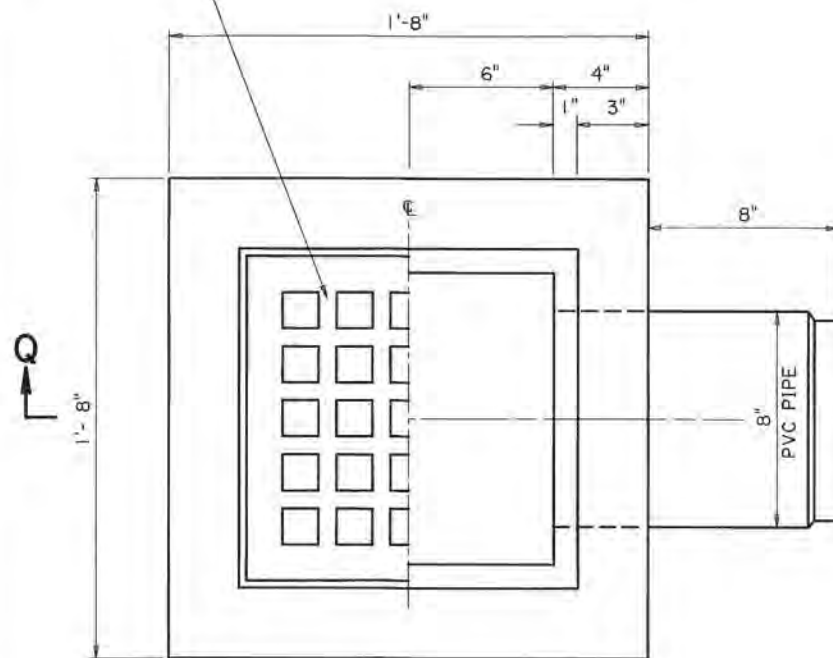
NOT TO BE USED WHERE SUBJECT
TO VEHICULAR TRAFFIC.



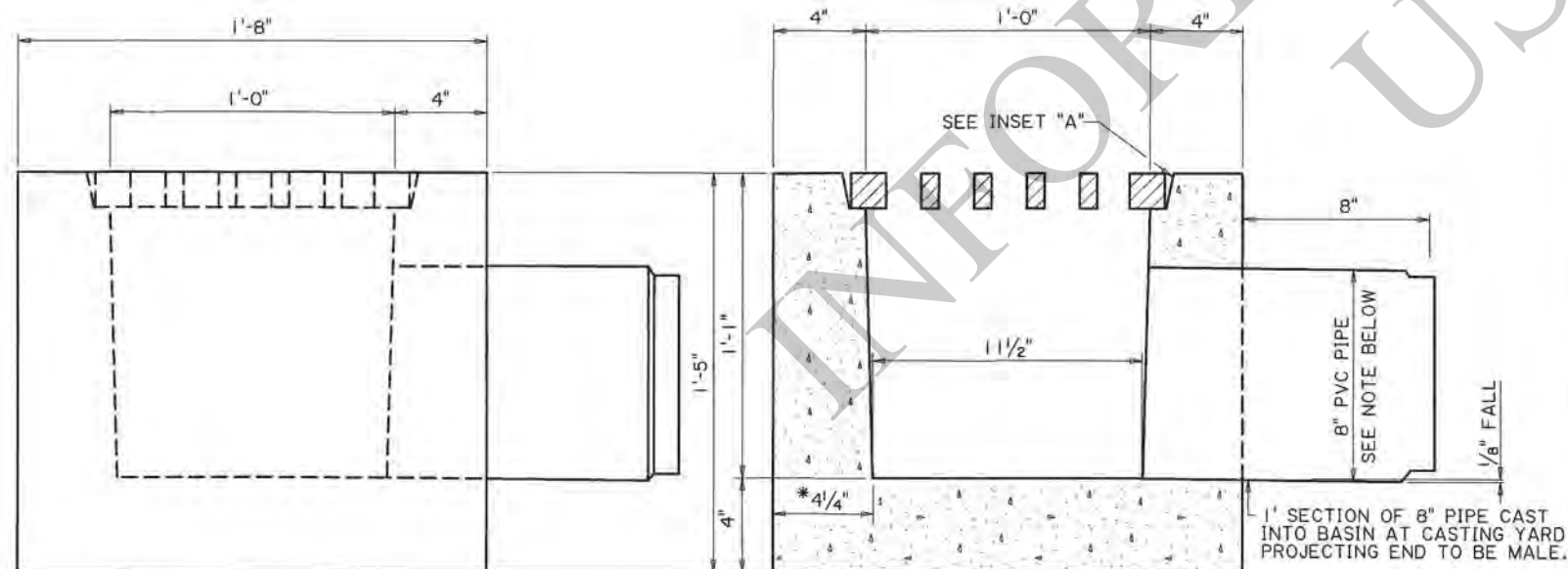
#4 BAR A

NOTE: STANDARD PLAN MC-01 (DETAILS OF GRATES, FRAMES, SEATS, LIDS, ETC.) MAY BE OBTAINED FROM:
HYDRAULICS SECTION
DEPARTMENT OF TRANSPORTATION
AND DEVELOPMENT
P.O. BOX 94245
CAPITOL STATION
BATON ROUGE, LA 70804

																																																																																																																																																											
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WEIGHT APPROX. 460 LBS PLUS GRATE
RIGHT HALF OF GRATE NOT SHOWN FOR CLARITY



*4" UNIFORM WALLS MAY BE USED,
AT SUPPLIERS OPTION

NOT TO BE USED WHERE
SUBJECT TO VEHICULAR
TRAFFIC

STANDARD PLAN MC-01 (DETAILS OF GRATES, FRAMES, SEATS
LIDS, ETC.), MAY BE OBTAINED FROM:

INSET A
(TYPICAL)

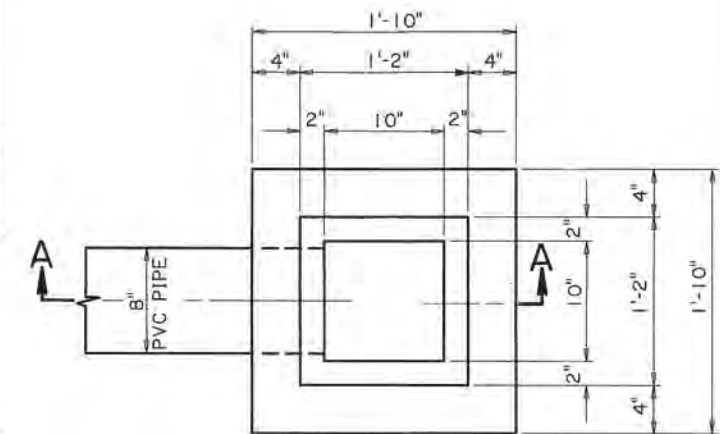
NOTES:

CONCRETE TO BE CLASS A1.

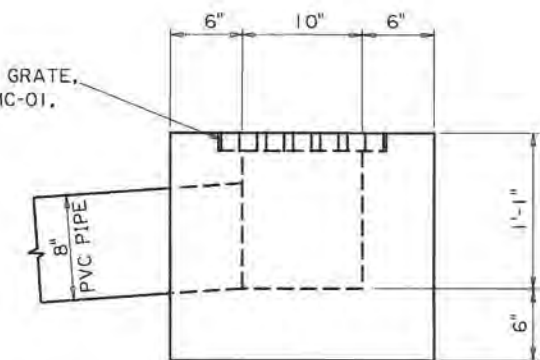
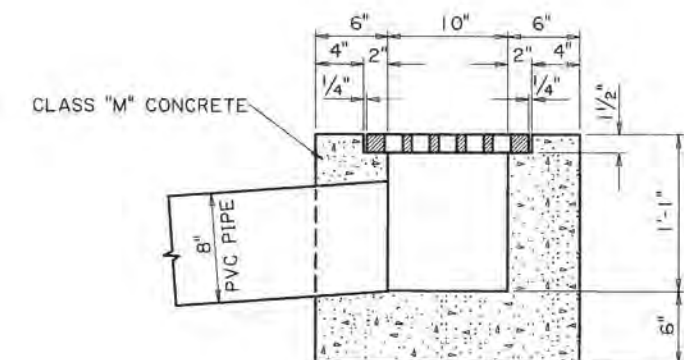
CATCH BASIN TO BE SUPPLIED COMPLETE,
INCLUDING C.I. GRATE.

THE CATCH BASIN SUPPLIER SHALL BE
RESPONSIBLE FOR SELECTION AND PLACEMENT
OF ANY PICK-UP AND HANDLING DEVICES.
SETTING TOLERANCE TO BE +0 & -1".

CLASS "M" CONCRETE

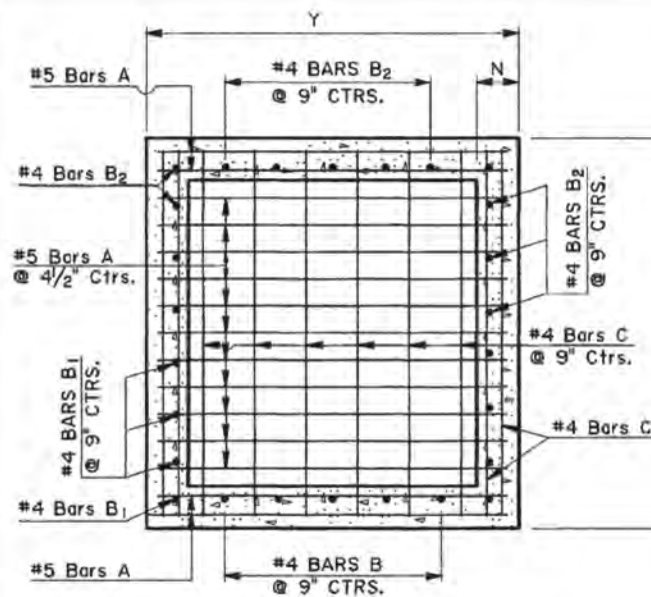


PLAN
GRATE NOT SHOWN

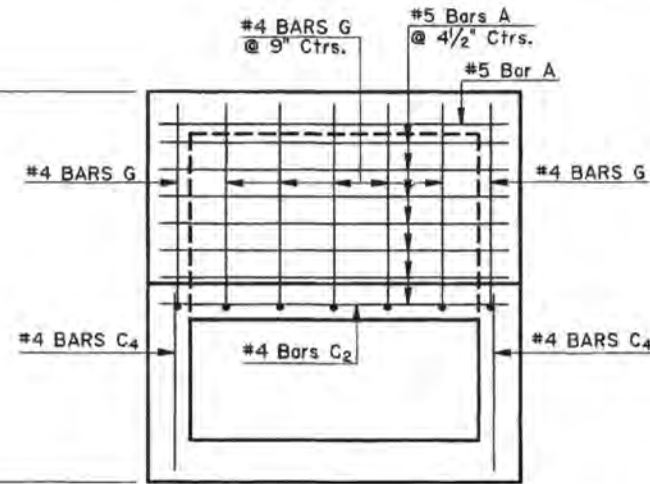
ELEVATION

NOT TO BE USED WHERE
SUBJECT TO VEHICULAR
TRAFFIC

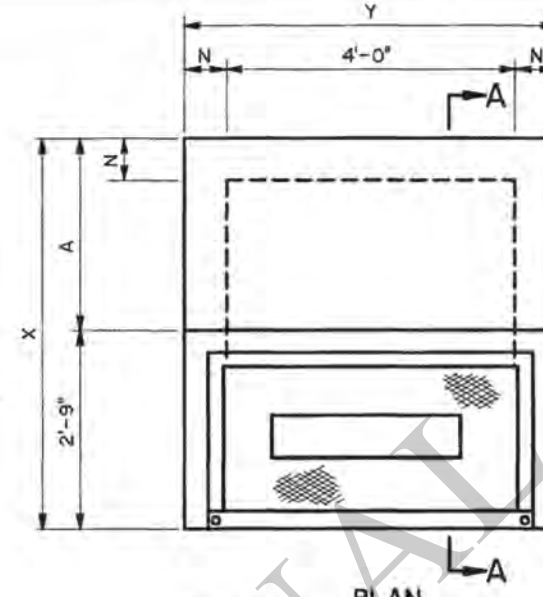
SHEET NUMBER			
PARISH			
CHECK		JCM	
DETAIL		TL	
CHECK		MH	
REVIEW		5-17-17	
SERIES #		1 OF 1	
 Mitra Hashemieh REG. NO. 25546 REGISTERED PROFESSIONAL ENGINEER IN CIVIL ENGINEERING <i>M. Hashemieh</i> 2/5/2019			
DATE		2/6/2019	
 Mitra Hashemieh REG. NO. 25546 REGISTERED PROFESSIONAL ENGINEER IN CIVIL ENGINEERING			
CONCRETE CATCH BASIN YARD DRAIN TYPE - PRECAST OR CAST-IN-PLACE MAX. PIPE: 8" To be used in conjunction with Std. Plan MC-01			
STANDARD PLAN		CB-05	
 LOUISIANA DEPARTMENT OF TRANSPORTATION & DEVELOPMENT HYDRAULICS SECTION			



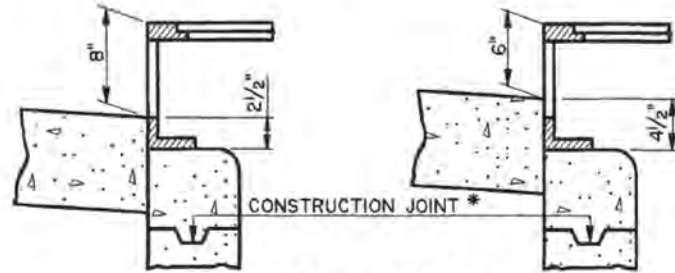
SECTION
SHOWING BOTTOM SLAB REINFORCING STEEL



PLAN
SHOWING TOP SLAB REINFORCING STEEL



PLAN
FOR DETAILS OF METAL GRATE AND COVER, SEE STD. PLAN MC-01, TYPE "H".

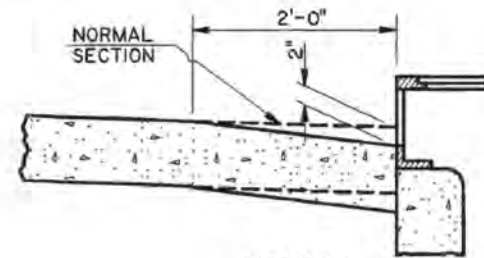


INLET CONFIGURATION

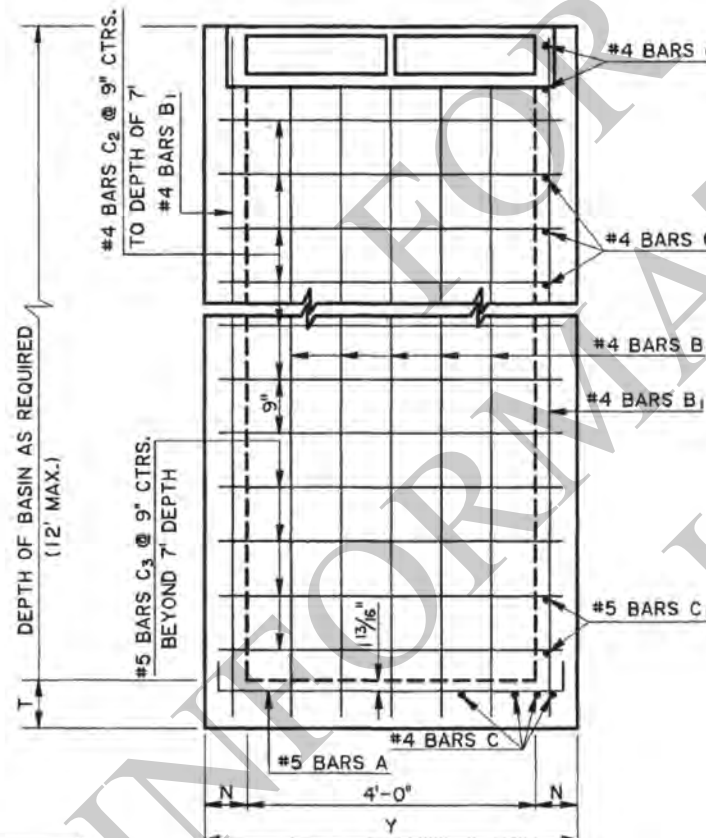
WHEN USED WITH
6" BARRIER CURB

WHEN USED WITH
4" MOUNTABLE CURB

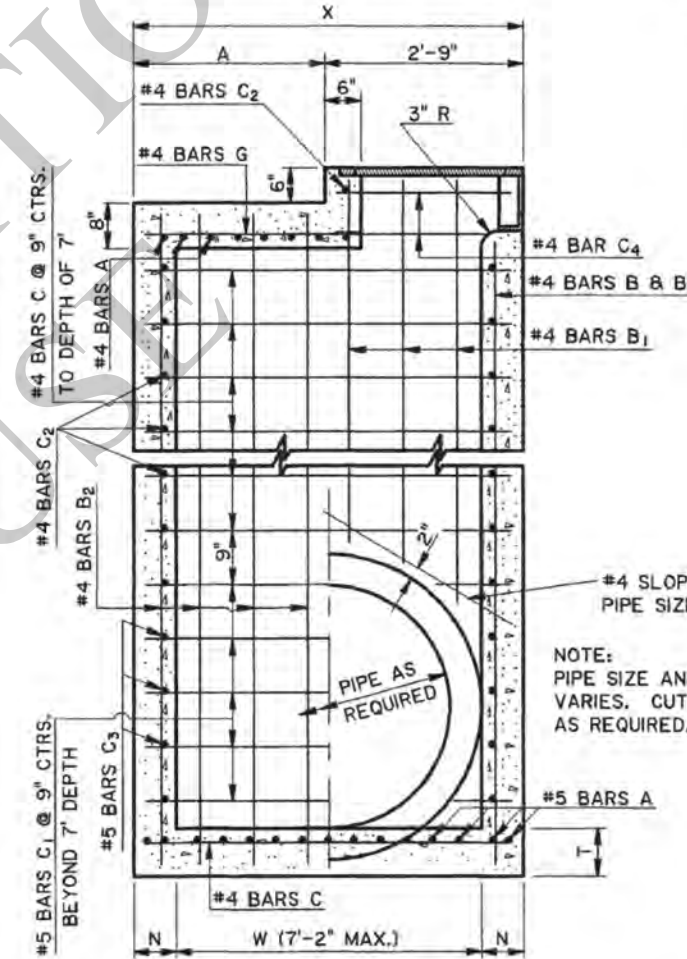
* NOTE:
THE BASIN SHALL NOT BE CONSTRUCTED ABOVE BOTTOM OF PAVEMENT
ELEVATION UNTIL THE PAVING ADJACENT TO THE BASIN IS IN PLACE.



SECTION
SHOWING PAVEMENT SUMP
TYPICAL

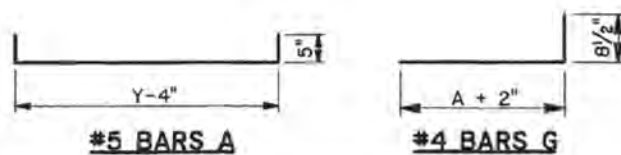


ELEVATION



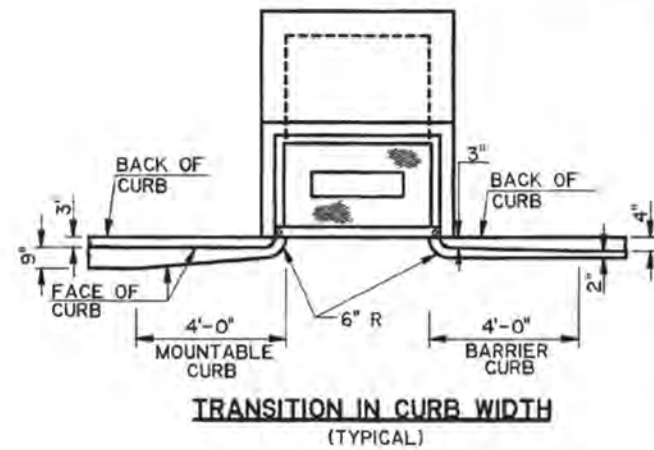
SECTION A-A

NOTE:
PIPE SIZE AND LOCATION
VARIES. CUT STEEL TO CLEAR
AS REQUIRED.

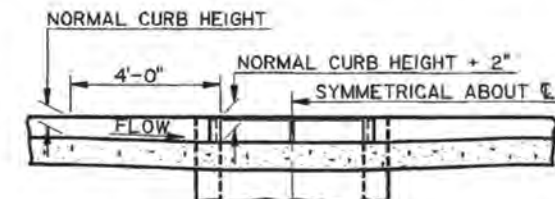


#5 BARS A

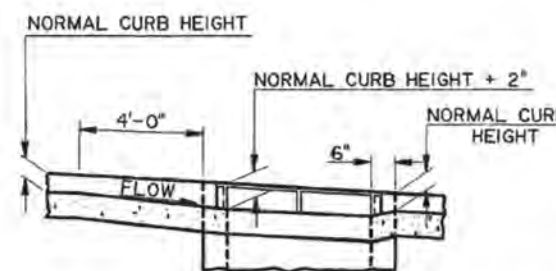
#4 BARS G



TRANSITION IN CURB WIDTH
(TYPICAL)



TRANSITION IN CURB HEIGHT
CATCH BASIN AT LOW POINT

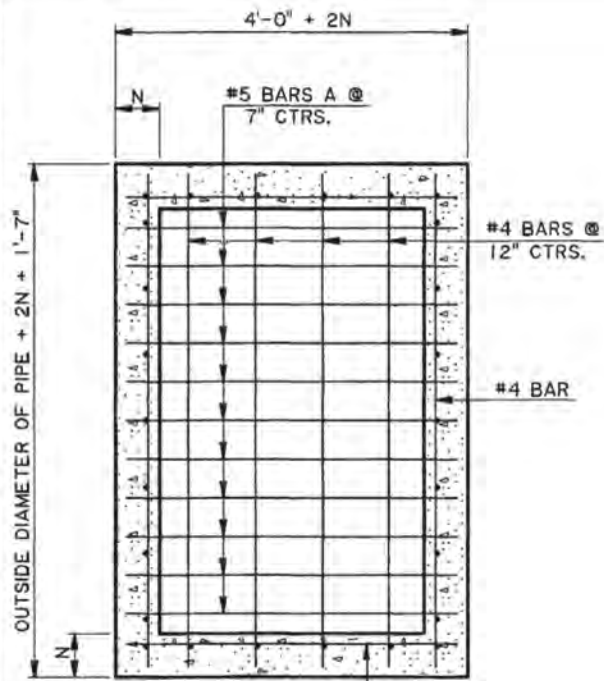


TRANSITION IN CURB HEIGHT
CATCH BASIN ON A GRADE

CONCRETE CATCH BASIN

PIPE DIA. ①	W ②	T	DEPTH LESS THAN 8'				DEPTH FROM 8' TO 12'			
			X	Y	N	A	X	Y	N	A
In	Ft-In	In	Ft-In	Ft-In	In	Ft-In	Ft-In	Ft-In	In	Ft-In
15 to 24	2-6	8	3-8	5-2	7	0-11	3-10	5-4	8	1-1
30	3-1	8	4-3	5-2	7	1-6	4-5	5-4	8	1-8
36	3-8	8	4-10	5-2	7	2-1	5-0	5-4	8	2-3
42	4-3	8	5-5	5-2	7	2-8	5-7	5-4	8	2-10
48	4-10	8	6-0	5-2	7	3-3	6-2	5-4	8	3-5
54	5-5	9	6-7	5-2	7	3-10	6-9	5-4	8	4-0
60	6-0	9	7-2	5-2	7	4-5	7-4	5-4	8	4-7
72	7-2	9	8-4	5-2	7	5-7	8-6	5-4	8	5-9

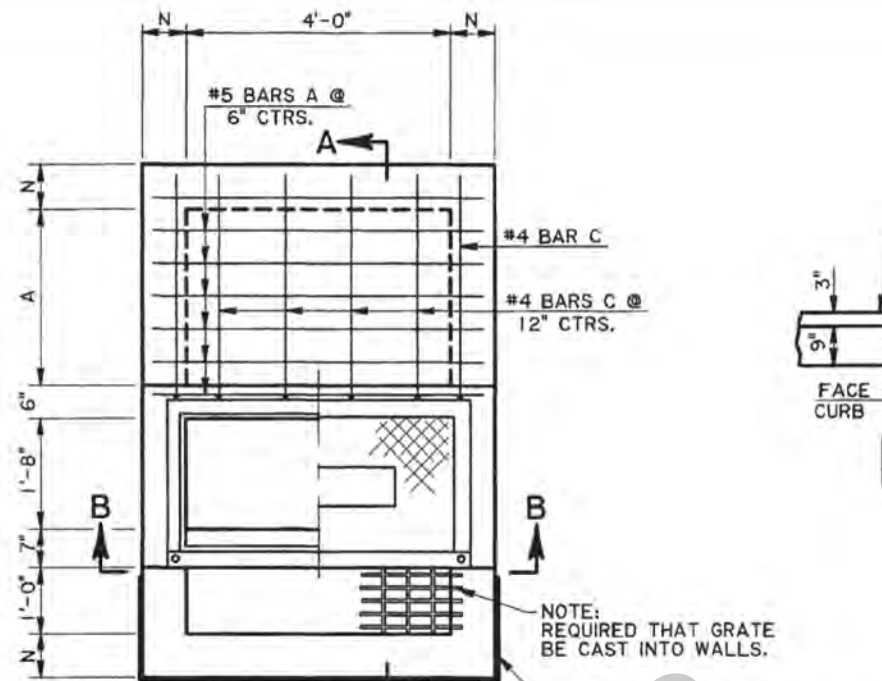
- ① REFERS TO SIDEWALL PIPE OR "TRUNKLINE".
FRONTWALL OR "CROSSING PIPE" MAY NOT EXCEED 42".
- ② W AND X DIMENSIONS MAY BE VARIED FOR
SKEWED PIPE, BUT W SHALL NOT EXCEED 7'-2".



SECTION

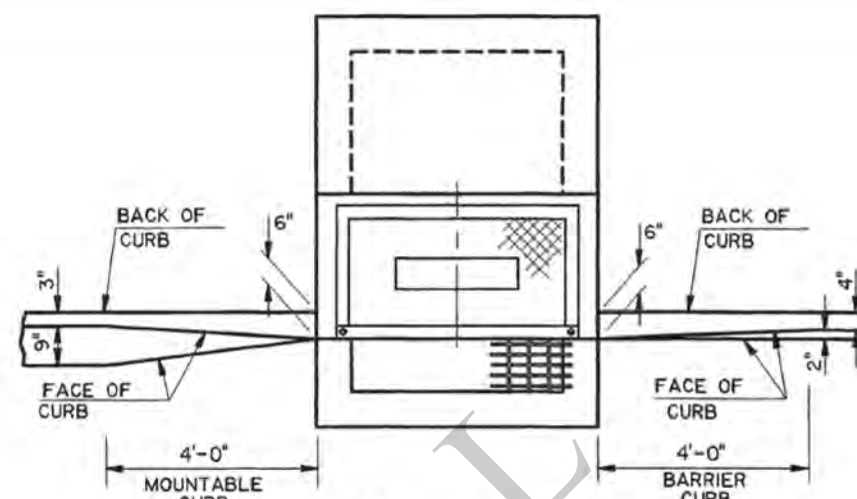
SHOWING BOTTOM SLAB REINFORCING STEEL

NOTE:
THE BASIN SHALL NOT BE
CONSTRUCTED ABOVE BOTTOM
OF PAVEMENT ELEVATION UNTIL
PAVEMENT ADJACENT TO THE
BASIN IS IN PLACE.

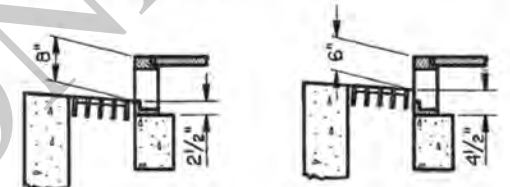


PLAN

FOR DETAILS OF METAL COVER,
FRAME AND GRATE, SEE STD.
PLAN MC-01, TYPE H & TYPE I.



TRANSITION IN CURB WIDTH
(TYPICAL)



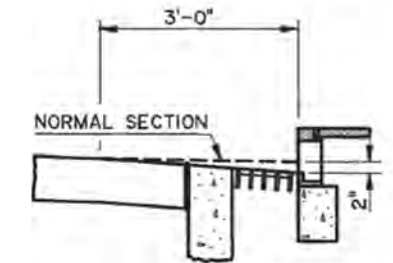
INLET CONFIGURATION

WHEN USED WITH 6" BARRIER CURB
WHEN USED WITH 4" MOUNTABLE CURB

DEPTH OF BASIN	N
FT	IN
LESS THAN 8	7
8 TO 12	8

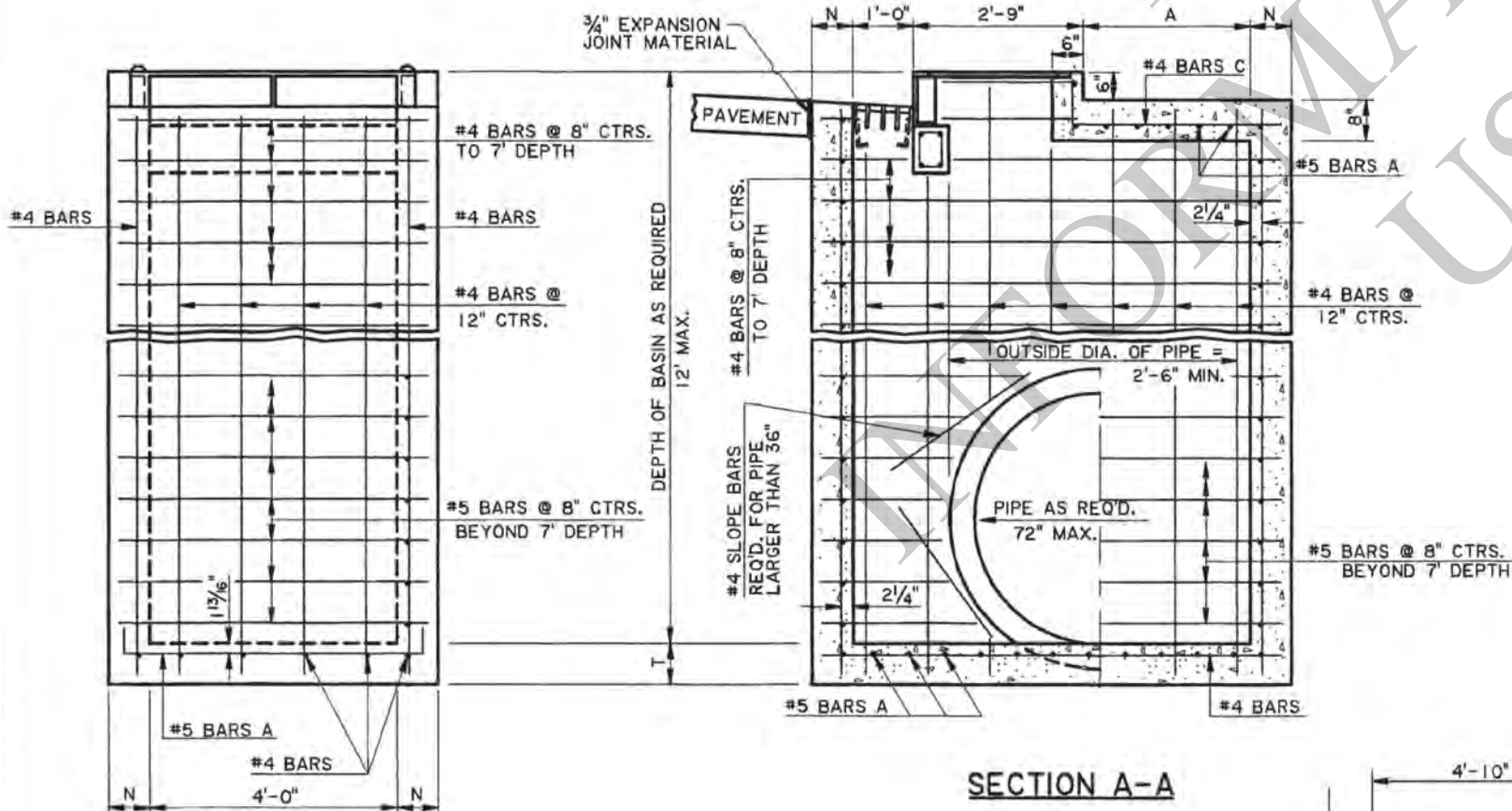
PIPE DIAMETER	A	T
IN	FT-IN	IN
15 TO 24	0-4	8
30	0-11	8
36	1-6	8
42	2-1	8
48	2-8	8
54	3-3	9
60	3-10	9
72	5-0	10

NOTE:
DIMENSION "A" MAY BE VARIED FOR
SKEWED PIPE, BUT MAY NOT EXCEED 5'-0".



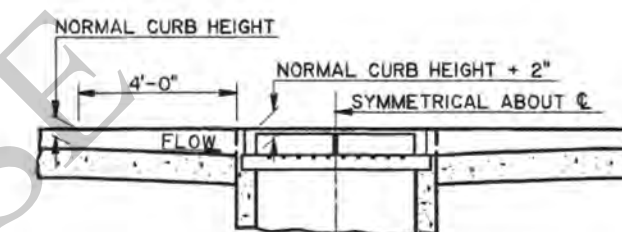
SECTION

(SHOWING PAVEMENT
SUMP TYPICAL)

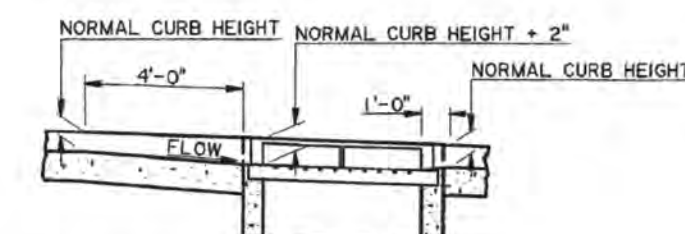


SECTION A-A

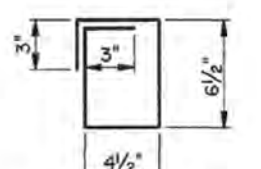
ELEVATION



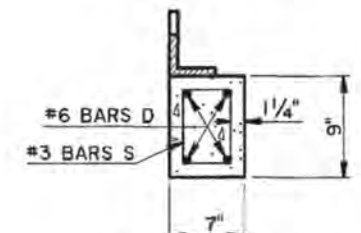
**TRANSITION IN CURB HEIGHT
CATCH BASIN AT LOW POINT**



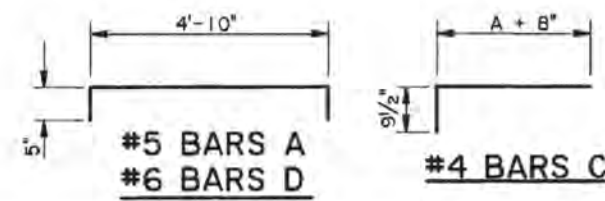
**TRANSITION IN CURB HEIGHT
CATCH BASIN ON A GRADE**



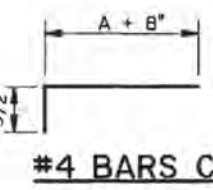
#3 BARS S



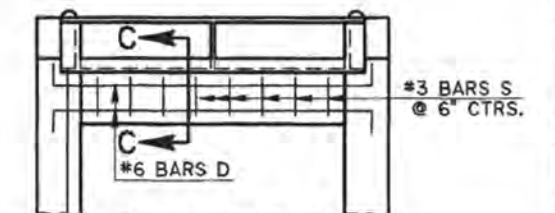
SECTION C-C



**#5 BARS A
#6 BARS D**

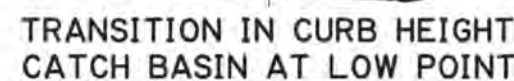


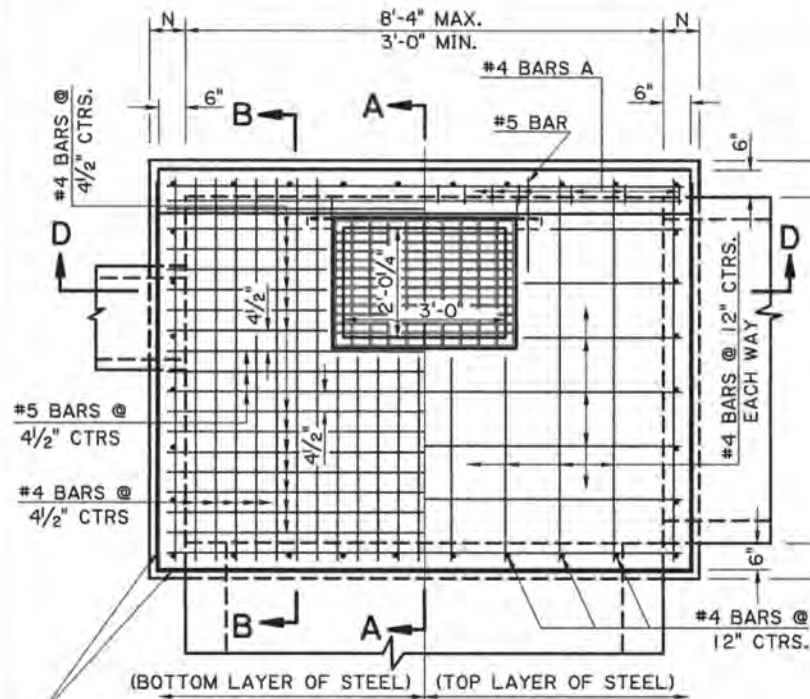
#4 BARS C



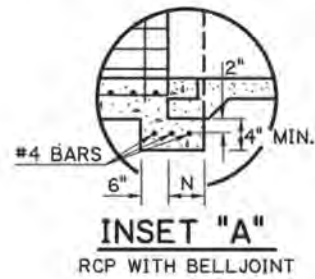
SECTION B-B

DESIGNED	CDJ	CHECKED	KAJ	DATE	1-31-97	SHEET	1 OF 1
PARISH		FEDERAL PROJECT		STATE PROJECT			
REVISION DESCRIPTION	11-2-00 Redrafted & Converted Metric CB-07 to English CB-07	DATE	11-2-00	BY	JCM	DATE	11-2-00
APPROVED BY	CHET ENGINEER	DATE	11-2-00	BY	JCM	DATE	11-2-00
CONCRETE CATCH BASIN CURB AND GUTTER OPENING 4" Mountable Or 6" Barrier Curb Max. Pipes: 42" x 72", Max. Depth: 12'							
HYDRAULICS SECTION							



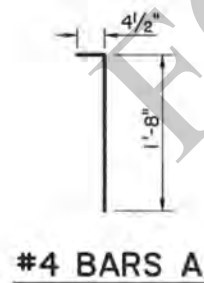


TOP SLAB PLAN

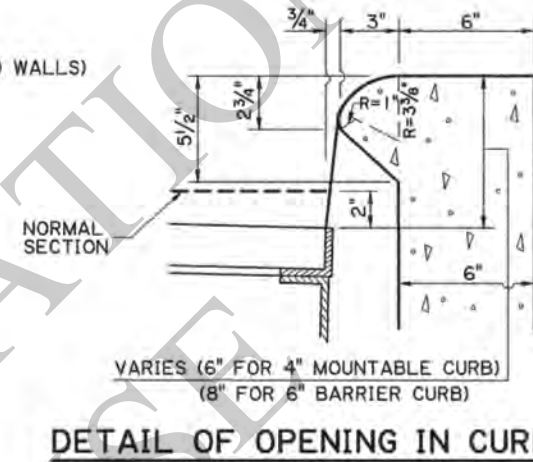


INSET "A"
RCP WITH BELLJOINT

SECTIONAL PLAN
(SHOWING REINFORCING IN BOTTOM SLAB AND WALLS)



#4 BARS A



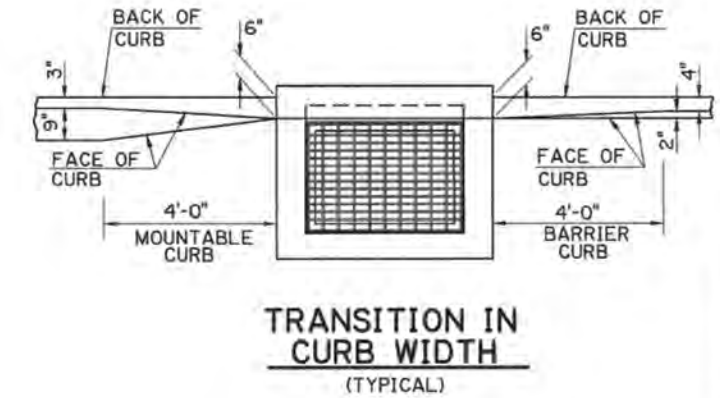
DETAIL OF OPENING IN CURB

GENERAL NOTES:

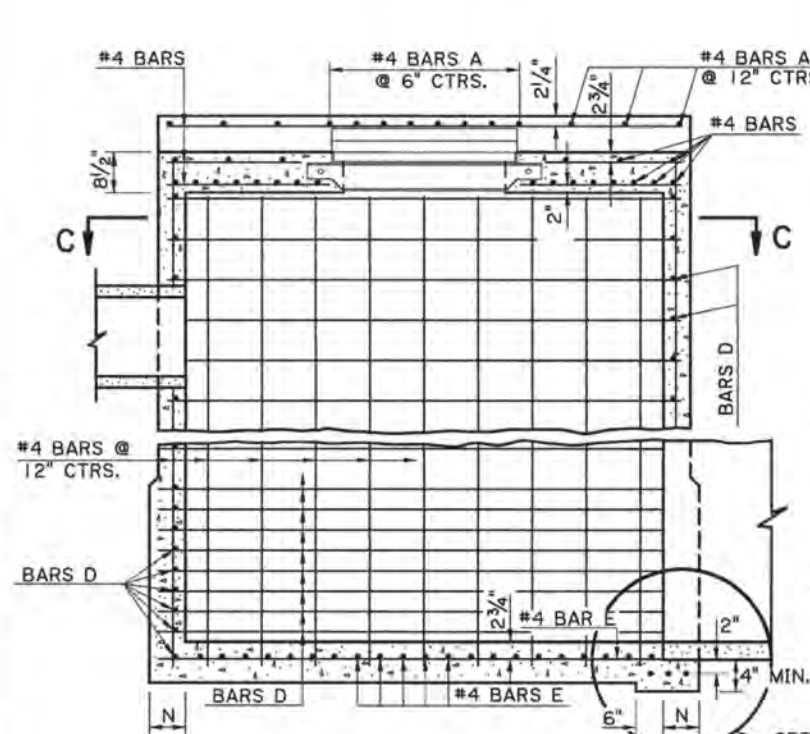
1. CATCH BASIN IS DESIGNED ACCORDING TO 4TH ED. 2007 AASHTO LRFD PROCEDURES, SECTION 702 OF THE DOTD STANDARD SPECIFICATIONS SHALL APPLY.
2. CONCRETE: ALL CONCRETE SHALL BE CLASS "M" MINOR STRUCTURE. ALL EXPOSED EDGES SHALL BE CHAMFERED 3/4 IN. EXCEPT AS NOTED.
3. REINFORCING STEEL: REINFORCING STEEL SHALL BE GRADE 60. DIMENSIONS ARE TO BAR CENTERS. MINIMUM COVER FOR REINFORCING BARS SHALL BE 2 IN. CLEAR UNLESS SHOWN OTHERWISE.
4. AS DEPTH INCREASES THE WALL AND SLAB THICKNESSES AND REINFORCEMENT SHOULD BE INCREASED AS SHOWN IN THE TABLE BELOW. THE CONTRACTOR HAS THE OPTION TO PROVIDE THE MAXIMUM REQUIRED WALL THICKNESS FOR THE FULL DEPTH OF THE STRUCTURE.

DEPTH RANGE	WALLS			BOTTOM SLAB		
	N	D BARS	IN. SIZE SPAC., IN.	T	E BARS	IN. SIZE SPAC., IN.
0' TO 9'	6.0	4	5.0	6.0	4	6.5
9'-1" TO 12'	6.5	4	4.5	6.5	4	6.0
12'-1" TO 16'	7.0	5	5.5	7.0	4	5.0
16'-1" TO 20'	7.5	5	5.0	7.5	4	4.5

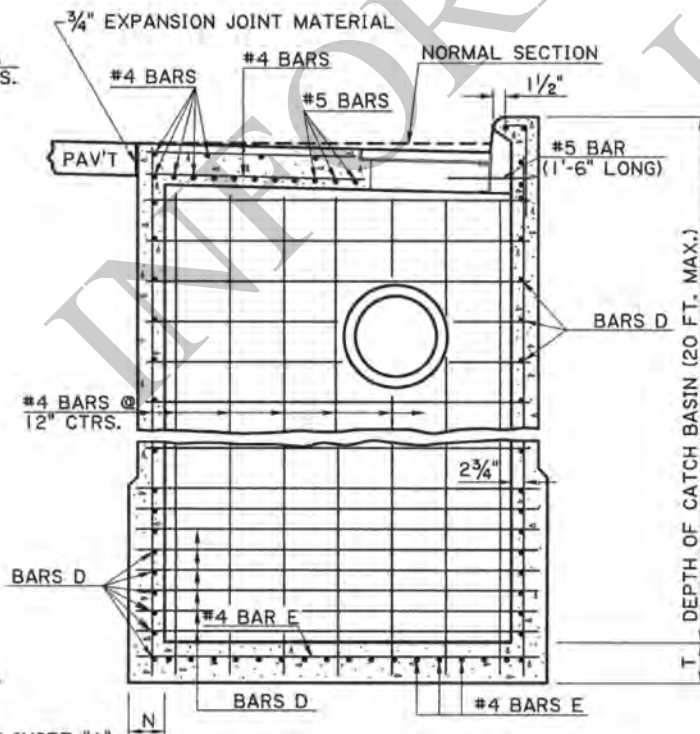
5. FOR DETAILS OF METAL GRATE AND GRATE SEAT, SEE STD. PLAN MC-01, TYPE C & TYPE F.
6. THE CONTRACTOR WILL NOT POUR ABOVE THE BOTTOM OF THE SLAB UNTIL THE PAVING ADJACENT TO THE CATCH BASIN HAS BEEN COMPLETED.



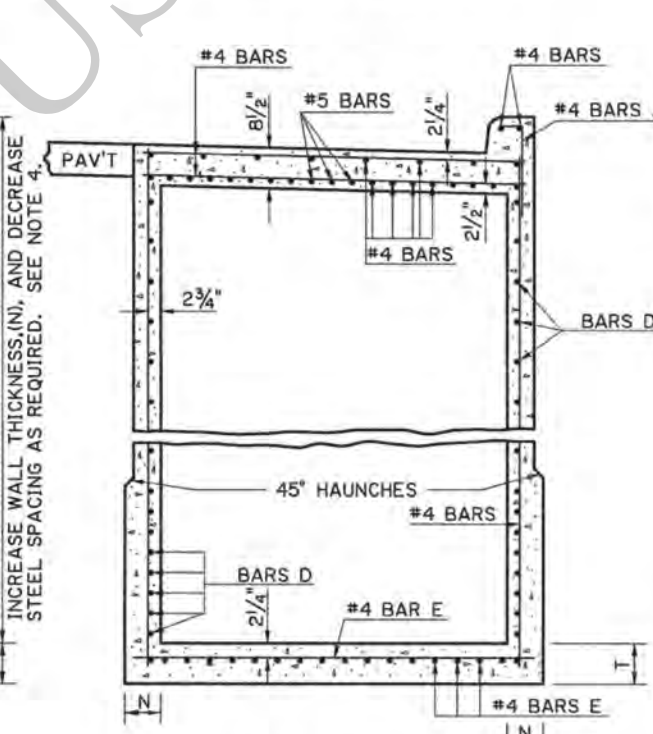
TRANSITION IN CURB WIDTH
(TYPICAL)



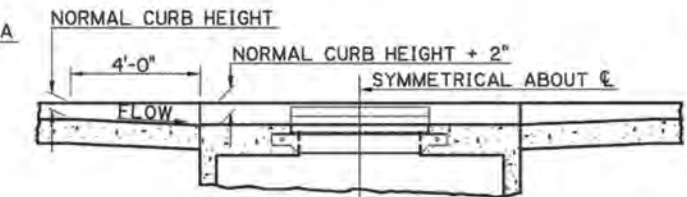
SECTION D-D



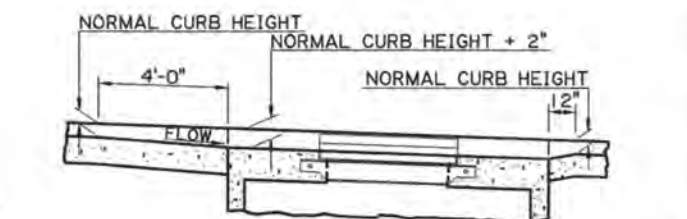
SECTION A-A



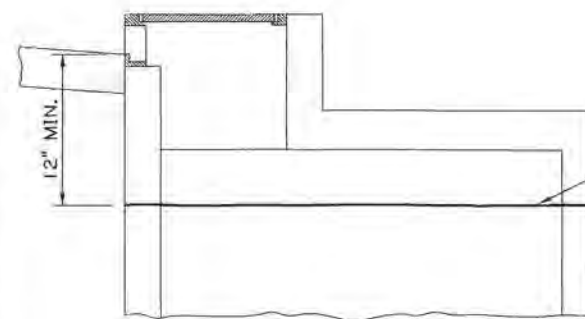
SECTION B-B



TRANSITION IN CURB HEIGHT
CATCH BASIN AT LOW POINT

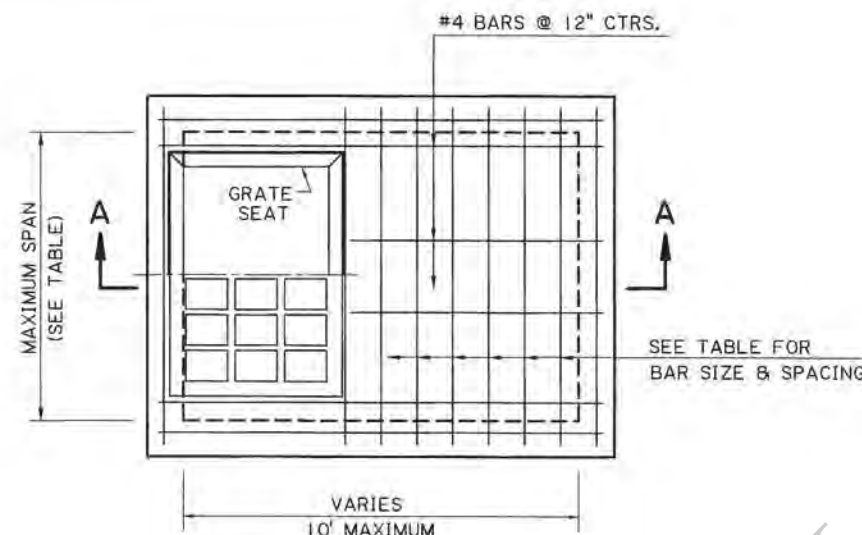


TRANSITION IN CURB HEIGHT
CATCH BASIN ON A GRADE



SECTION
EXISTING STRUCTURE

REMOVE EXISTING
CATCH BASIN OR
MANHOLE TO THIS LINE.
IF CONCRETE, EXISTING
BARS TO BE EXPOSED,
CLEANED, AND BENT AS
SHOWN IN SECTION A-A.



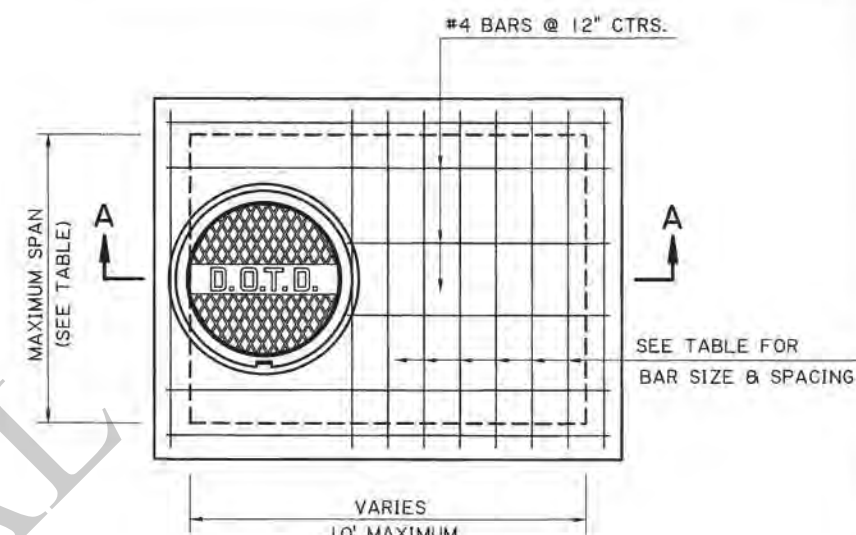
CATCH BASIN PLAN

SHOWING NEW CONSTRUCTION
GRATE TO BE TYPE "B" OR "C".
TYPE "B" SHOWN.

* TYPE "B" AND "C" GRATES SHOULD NOT BE USED IN THE TRAVEL LANE.

TYPE "B" GRATE IS TO BE USED WHERE NO PEDESTRIAN TRAFFIC AND
NO VEHICULAR TRAFFIC IS EXPECTED. (DITCHES, ETC.)

TYPE "C" GRATE IS TO BE USED WHERE PEDESTRIAN TRAFFIC AND/OR LIGHT
VEHICULAR TRAFFIC IS EXPECTED. (DRIVEWAYS, SHOULDERS, ETC.)



MANHOLE PLAN

SHOWING NEW CONSTRUCTION

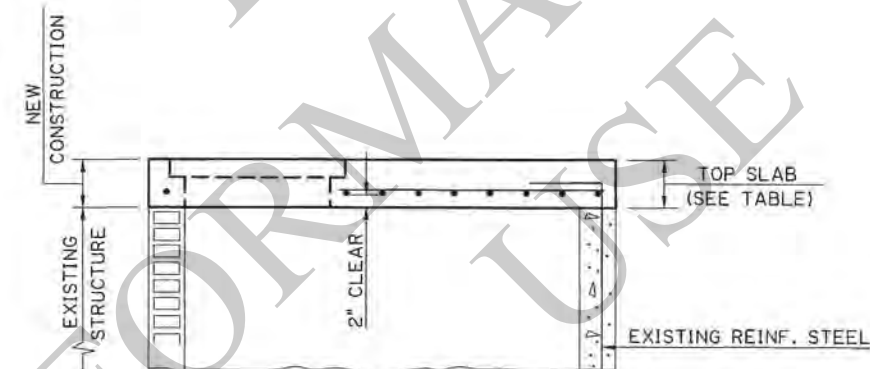
GENERAL NOTES:

DIMENSIONS RELATING TO REINFORCED STEEL ARE TO
BARS CENTERS.

FOR DETAILS OF CATCH BASIN GRATE AND SEAT,
SEE STD. PLAN MC-01 (TYPE B OR C).

FOR DETAILS OF MANHOLE CAST IRON COVER AND SEAT,
SEE STD. PLAN MC-01 (TYPE K OR K₁).

PROJECT SPECIFICATIONS FOR MANHOLES, JUNCTION BOXES
AND CATCH BASINS SHALL APPLY.



SECTION A-A

SHOWING NEW CONSTRUCTION FOR CATCH BASIN OR MANHOLE
(FOR CONCRETE OR BRICK WALL)

MAXIMUM SPAN	TOP SLAB	BAR SIZE	BAR SPACING
4'	8"	#5	8"
6'	8 1/2"	#5	6"
8'	9 1/2"	#5	5"
9'	10 1/2"	#5	4"

ADJUSTMENT/CONVERSION OF EXISTING CATCH BASINS OR MANHOLES

- NOTE: 1) FOR ALL CATCH BASIN ADJUSTMENTS, THIS DETAIL SHOULD BE INCLUDED IN THE PLANS AND PAID FOR WITH APPROPRIATE PAY ITEMS.
- 2) FOR ALL CATCH BASIN AND MANHOLE CONVERSIONS (CATCH BASIN TOP TO MANHOLE TOP OR MANHOLE TOP TO CATCH BASIN TOP), THIS DETAIL SHOULD BE INCLUDED IN THE PLANS ALONG WITH THE APPROPRIATE STANDARD PLAN/SPECIAL DETAIL TO CONSTRUCT THE NEW TOP. IF NO STANDARD PLAN/SPECIAL DETAIL IS INCLUDED, THE TOP IS TO BE BUILT AS SHOWN ON THIS DETAIL. ALL CONVERSIONS SHOULD BE PAID FOR WITH APPROPRIATE PAY ITEMS.
- 3) FOR ALL MANHOLE ADJUSTMENTS GREATER THAN 7". THIS DETAIL SHOULD BE INCLUDED IN THE PLANS AND PAID FOR WITH APPROPRIATE PAY ITEMS.
- 4) FOR ALL MANHOLE ADJUSTMENTS LESS THAN OR EQUAL TO 7", MANHOLE ADJUSTMENT RINGS MAY BE USED. SHOULD BE PAID FOR WITH APPROPRIATE PAY ITEMS AND NO DETAIL IS NEEDED IN THE PLANS. REFER TO STANDARD PLAN MC-01.
- 5) FOR ALL CATCH BASIN/MANHOLE ADJUSTMENTS, CLEAN EXISTING GRATES/FRAMES AS PER PROJECT SPECIFICATIONS FOR MANHOLES, JUNCTION BOXES AND CATCH BASINS.

SHEET NUMBER	
PARISH	CONTROL SECTION
PAA MH	KAJ MH
DESIGN CHECK	REVIEW
DATE: 5/7/2019	SERIES: 1 OF 1

STATE OF LOUISIANA
MITRA HASHEMIEH
REG. No. 28546
REGISTERED
PROFESSIONAL
ENGINEER
IN
CIVIL ENGINEERING

Mitra Hashemieh
5/7/2019

APPROVED BY CHIEF ENGINEER:

Christopher P. Hest
10/30/19

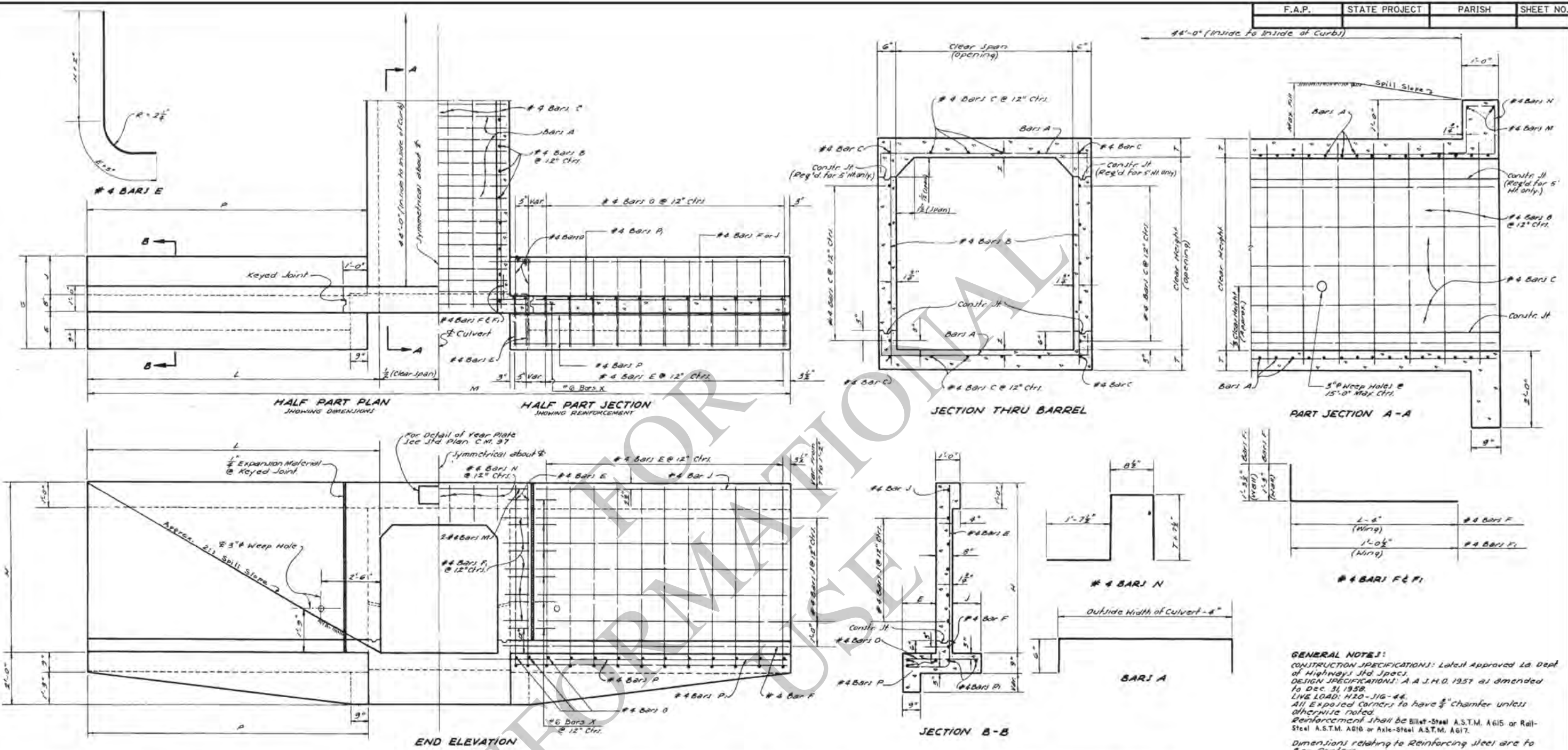
STATE OF LOUISIANA
CONFIDENTIAL

ADJUSTMENT/CONVERSION
OF EXISTING CATCH BASINS
OR MANHOLES

CB-ADJUST

DOTD
LOUISIANA DEPARTMENT OF
TRANSPORTATION & INFRASTRUCTURE

HYDRAULICS
DESIGN

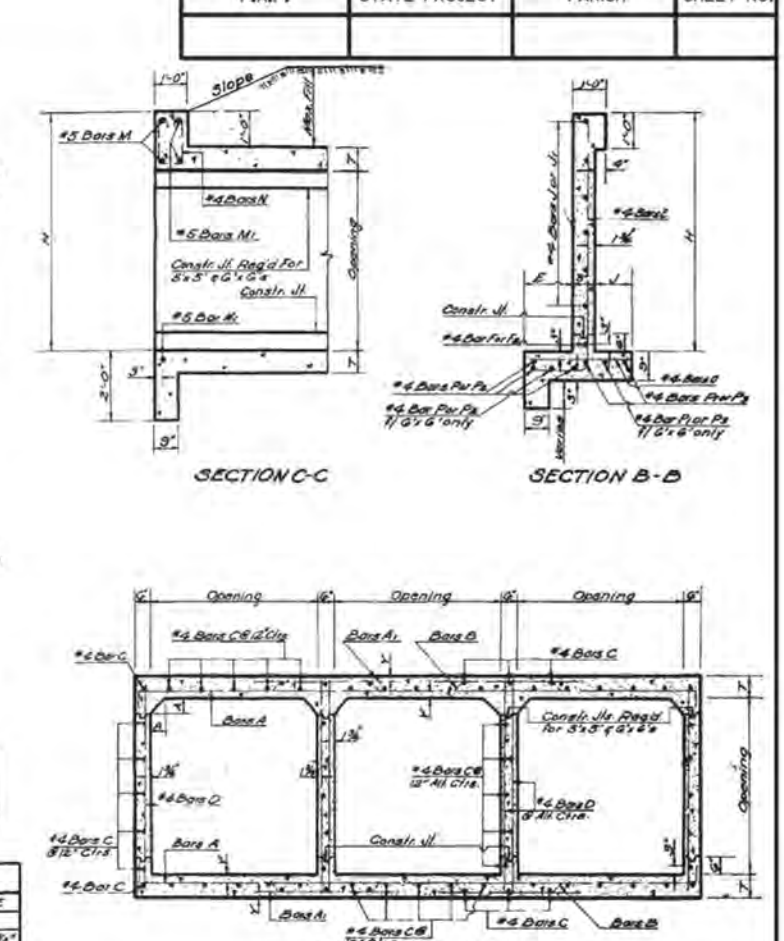
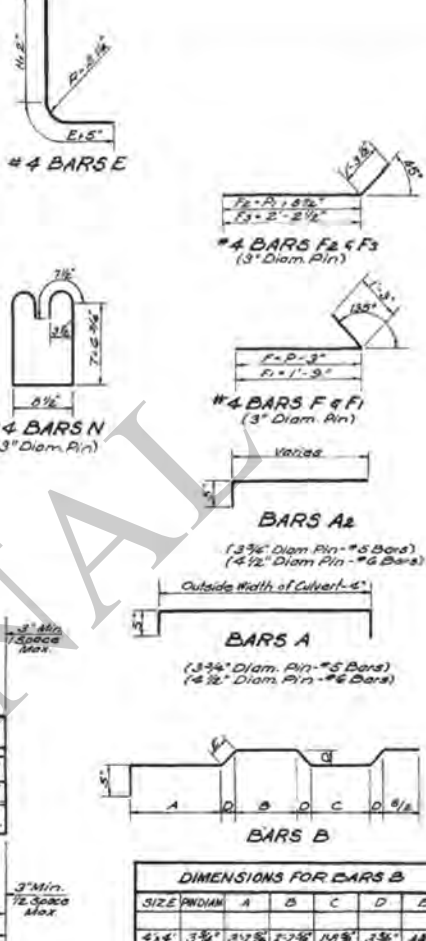
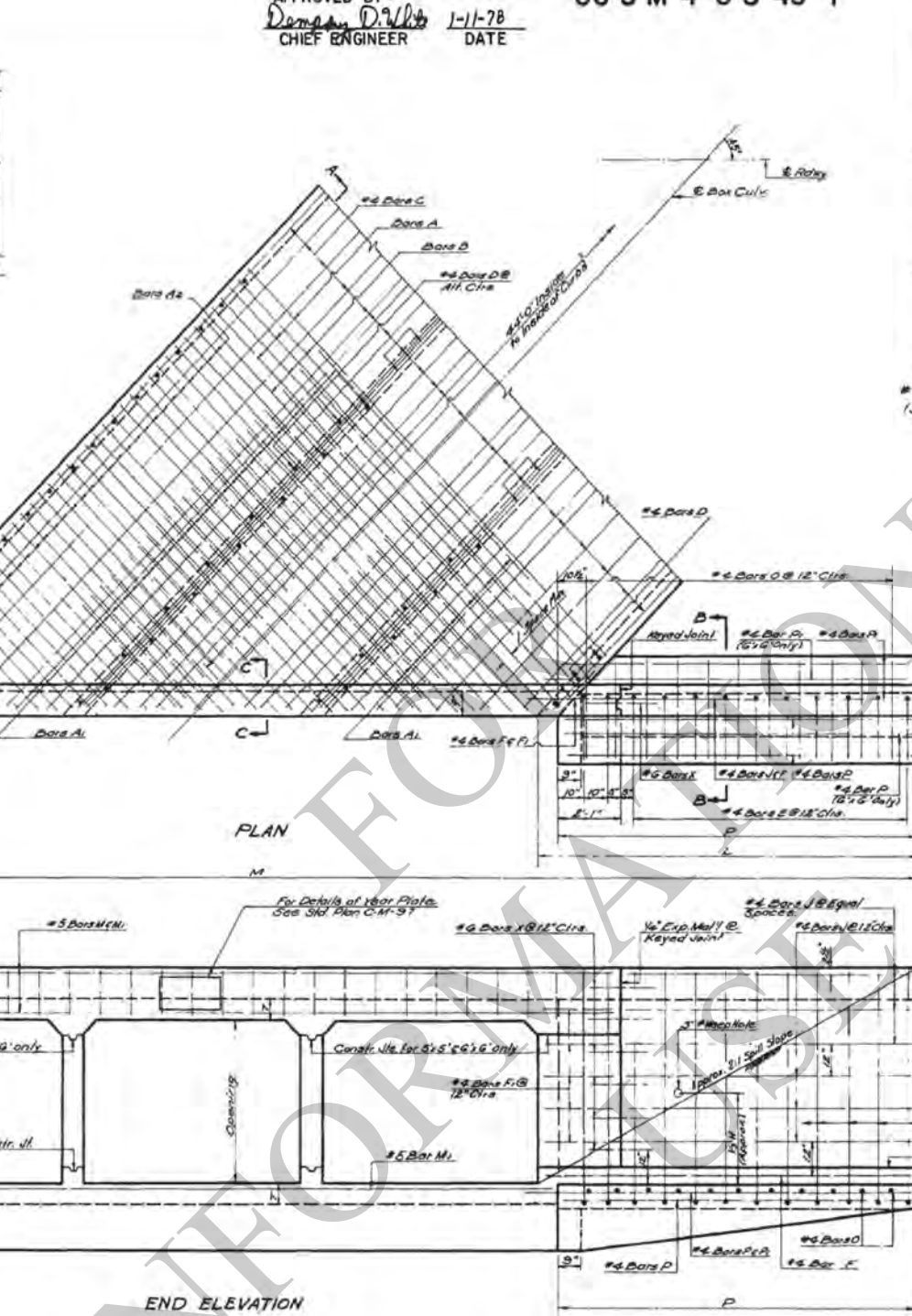
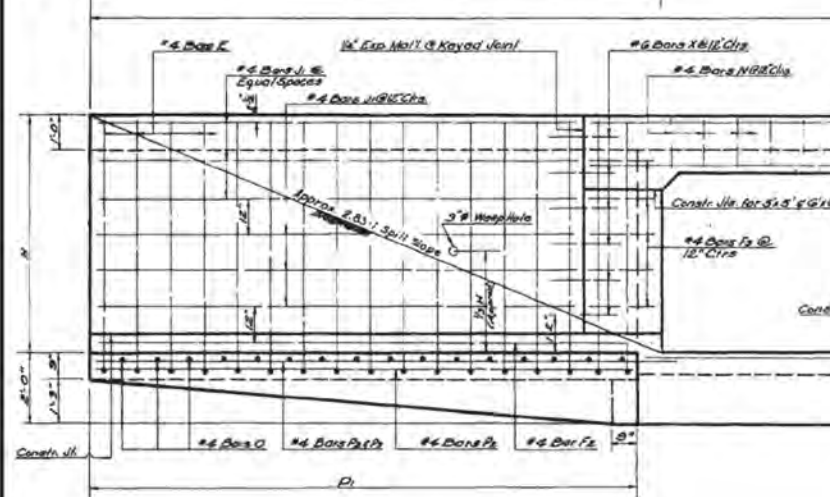
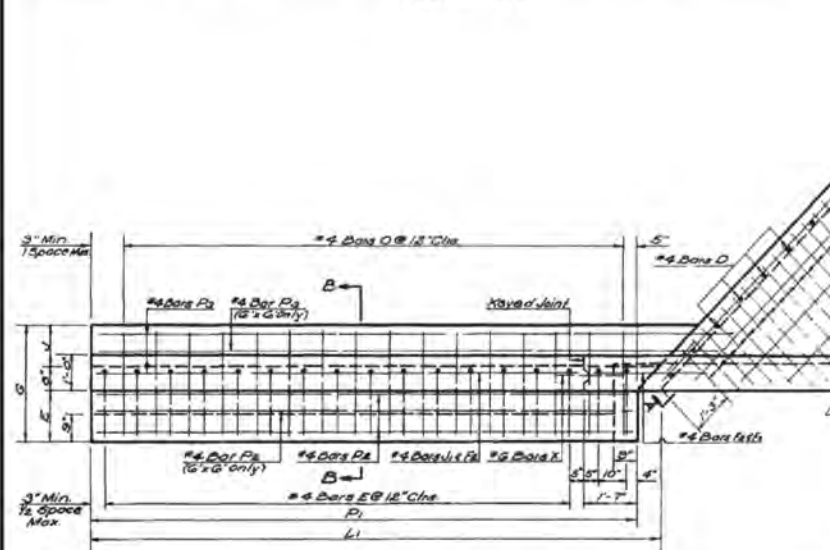
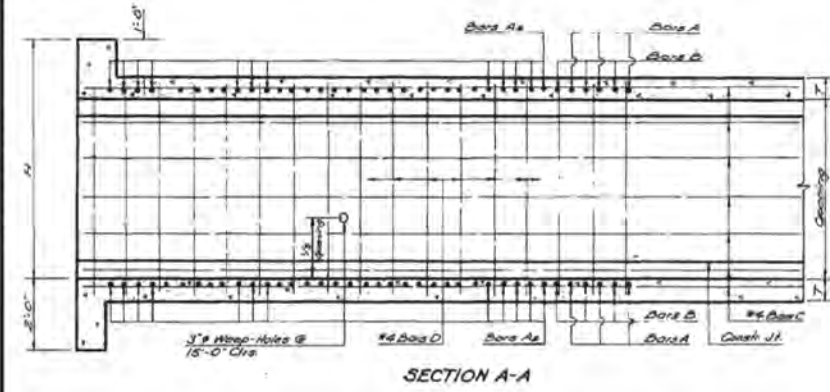


DIMENSIONS														BILL OF REINFORCING STEEL FOR 4'-0" CULVERT																		QUANTITIES				OPENINGS																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																		
OPENINGS		MAX. FILL		BARREL		WINGS & CURBS								BARREL REINFORCEMENT						WING AND CURB REINFORCEMENT												PER LIN. FT. OF BARREL		4'-0" CULVERT																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																				
CLEAR SPAN	HEIGHT	AREA	TOP LAB	BOIL LAB	WALL	T	Z	E	J	G	H	L	P	M	BAR A		#BAR B		#BAR C		#BAR E		#BAR F		#BAR G		#BAR J		#BAR K		#BAR L		#BAR M		#BAR N		#BAR O		#BAR P		#BAR Q		#BAR R		#BAR S		#BAR T		#BAR U		#BAR V		#BAR W		#BAR X		#BAR Y		#BAR Z		#BAR AA		#BAR AB		#BAR AC		#BAR AD		#BAR AE		#BAR AF		#BAR AG		#BAR AH		#BAR AI		#BAR AJ		#BAR AK		#BAR AL		#BAR AM		#BAR AN		#BAR AO		#BAR AP		#BAR AQ		#BAR AR		#BAR AS		#BAR AT		#BAR AU		#BAR AV		#BAR AW		#BAR AX		#BAR AY		#BAR AZ		#BAR BA		#BAR BB		#BAR BC		#BAR BD		#BAR BE		#BAR BF		#BAR BG		#BAR BH		#BAR BI		#BAR BJ		#BAR BK		#BAR BL		#BAR BM		#BAR BN		#BAR BO		#BAR BP		#BAR BQ		#BAR BR		#BAR BS		#BAR BT		#BAR BU		#BAR BV		#BAR BW		#BAR BX		#BAR BY		#BAR BZ		#BAR CA		#BAR CB		#BAR CC		#BAR CD		#BAR CE		#BAR CF		#BAR CG		#BAR CH		#BAR CI		#BAR CJ		#BAR CK		#BAR CL		#BAR CM		#BAR CN		#BAR CO		#BAR CP		#BAR CQ		#BAR CR		#BAR CS		#BAR CT		#BAR CU		#BAR CV		#BAR CW		#BAR CX		#BAR CY		#BAR CZ		#BAR DA		#BAR DB		#BAR DC		#BAR DD		#BAR DE		#BAR DF		#BAR DG		#BAR DH		#BAR DI		#BAR DJ		#BAR DK		#BAR DL		#BAR DM		#BAR DN		#BAR DO		#BAR DP		#BAR DQ		#BAR DR		#BAR DS		#BAR DT		#BAR DU		#BAR DV		#BAR DW		#BAR DX		#BAR DY		#BAR DZ		#BAR EA		#BAR EB		#BAR EC		#BAR ED		#BAR EE		#BAR EF		#BAR EG		#BAR EH		#BAR EI		#BAR EJ		#BAR EK		#BAR EL		#BAR EM		#BAR EN		#BAR EO		#BAR EP		#BAR EQ		#BAR ER		#BAR ES		#BAR ET		#BAR EU		#BAR EV		#BAR EW		#BAR EX		#BAR EY		#BAR EZ		#BAR FA		#BAR FB		#BAR FC		#BAR FD		#BAR FE		#BAR FF		#BAR FG		#BAR FH		#BAR FI		#BAR FJ		#BAR FK		#BAR FL		#BAR FM		#BAR FN		#BAR FO		#BAR FP		#BAR FQ		#BAR FR		#BAR FS		#BAR FT		#BAR FU		#BAR FV		#BAR FW		#BAR FX		#BAR FY		#BAR FZ		#BAR GA		#BAR GB		#BAR GC		#BAR GD		#BAR GE		#BAR GF		#BAR GG		#BAR GH		#BAR GI		#BAR GJ		#BAR GK		#BAR GL		#BAR GM		#BAR GN		#BAR GO		#BAR GP		#BAR GQ		#BAR GR		#BAR GS		#BAR GT		#BAR GU		#BAR GV		#BAR GW		#BAR GX		#BAR GY		#BAR GZ		#BAR HA		#BAR HB		#BAR HC		#BAR HD		#BAR HE		#BAR HF		#BAR HG		#BAR HH		#BAR HI		#BAR HJ		#BAR HK		#BAR HL		#BAR HM		#BAR HN		#BAR HO		#BAR HP		#BAR HQ		#BAR HR		#BAR HS		#BAR HT		#BAR HU		#BAR HV		#BAR HW		#BAR HX		#BAR HY		#BAR HZ		#BAR IA		#BAR IB		#BAR IC		#BAR ID		#BAR IE		#BAR IF		#BAR IG		#BAR IH		#BAR II		#BAR IJ		#BAR IK		#BAR IL		#BAR IM		#BAR IN		#BAR IO		#BAR IP		#BAR IQ		#BAR IR		#BAR IS		#BAR IT		#BAR IU		#BAR IV		#BAR IW		#BAR IX		#BAR IY		#BAR IZ		#BAR JA		#BAR JB		#BAR JC		#BAR JD		#BAR JE		#BAR JF		#BAR JG		#BAR JH		#BAR JI		#BAR JJ		#BAR JK		#BAR JL		#BAR JM		#BAR JN		#BAR JO		#BAR JP		#BAR JQ		#BAR JR		#BAR JS		#BAR JT		#BAR JU		#BAR JV		#BAR JW		#BAR JX		#BAR JY		#BAR JZ		#BAR KA		#BAR KB		#BAR KC		#BAR KD		#BAR KE		#BAR KF		#BAR KG		#BAR KH		#BAR KI		#BAR KJ		#BAR KK		#BAR KL		#BAR KM		#BAR KN		#BAR KO		#BAR KP		#BAR KQ		#BAR KR		#BAR KS		#BAR KT		#BAR KU		#BAR KV		#BAR KW		#BAR KX		#BAR KY		#BAR KZ		#BAR LA		#BAR LB		#BAR LC		#BAR LD		#BAR LE		#BAR LF		#BAR LG		#BAR LH		#BAR LI		#BAR LJ		#BAR LK		#BAR LL		#BAR LM		#BAR LN		#BAR LO		#BAR LP		#BAR LQ		#BAR LR		#BAR LS		#BAR LT		#BAR LU		#BAR LV		#BAR LW		#BAR LX		#BAR LY		#BAR LZ		#BAR MA		#BAR MB		#BAR MC		#BAR MD		#BAR ME		#BAR MF		#BAR MG		#BAR MH		#BAR MI		#BAR MJ		#BAR MK		#BAR ML		#BAR MN		#BAR MO		#BAR MP		#BAR MQ		#BAR MR		#BAR MS		#BAR MT		#BAR MU		#BAR MV		#BAR MW		#BAR MX		#BAR MY		#BAR MZ		#BAR NA		#BAR NB		#BAR NC		#BAR ND		#BAR NE		#BAR NF		#BAR NG		#BAR NH		#BAR NI		#BAR NJ		#BAR NK		#BAR NL		#BAR NO		#BAR NP		#BAR NQ		#BAR NR		#BAR NS		#BAR NT		#BAR NU		#BAR NV		#BAR NW		#BAR NX		#BAR NY		#BAR NZ		#BAR OA		#BAR OB		#BAR OC		#BAR OD		#BAR OE		#BAR OF		#BAR OG		#BAR OH		#BAR OI		#BAR OJ		#BAR OK		#BAR OL		#BAR OM		#BAR ON		#BAR OO		#BAR OP		#BAR OQ		#BAR OR		#BAR OS		#BAR OT		#BAR OU		#BAR OV		#BAR OW		#BAR OX		#BAR OY		#BAR OZ		#BAR PA		#BAR PB		#BAR PC		#BAR PD		#BAR PE		#BAR PF		#BAR PG		#BAR PH		#BAR PI		#BAR PJ		#BAR PK		#BAR PL		#BAR PM		#BAR PN		#BAR PO		#BAR PP		#BAR PQ		#BAR PR		#BAR PS		#BAR PT		#BAR PU		#BAR PV		#BAR PW		#BAR PX		#BAR PY		#BAR PZ		#BAR QA		#BAR QB		#BAR QC		#BAR 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UK		#BAR UL		#BAR UM		#BAR UN		#BAR UO		#BAR UP		#BAR UQ		#BAR UR		#BAR US		#BAR UT		#BAR UY		#BAR UZ		#BAR VA		#BAR VB		#BAR VC		#BAR VD		#BAR VE		#BAR VF		#BAR VG		#BAR VH		#BAR VI		#BAR VJ		#BAR VK		#BAR VL		#BAR VM		#BAR VN		#BAR VO		#BAR VP		#BAR VQ		#BAR VR		#BAR VS		#BAR VT		#BAR VU		#BAR VV		#BAR VW		#BAR VX		#BAR VY		#BAR VZ		#BAR WA		#BAR WB		#BAR WC		#BAR WD		#BAR WE		#BAR WF		#BAR WG		#BAR WH		#BAR WI		#BAR WJ		#BAR WK		#BAR WL		#BAR WM		#BAR WN		#BAR WO		#BAR WP		#BAR WQ		#BAR WR		#BAR WS		#BAR WT		#BAR WU		#BAR WV		#BAR WW		#BAR WX		#BAR WY		#BAR WZ		#BAR XA		#BAR XB		#BAR XC		#BAR XD		#BAR XE		#BAR XF		#BAR XG		#BAR XH		#BAR XI		#BAR XJ		#BAR XK		#BAR XL		#BAR XM		#BAR XN		#BAR XO		#BAR XP		#BAR XQ		#BAR XR		#BAR XS		#BAR XT		#BAR XU		#BAR XV		#BAR XW		#BAR XX		#BAR XY		#BAR XZ		#BAR YA		#BAR YB		#BAR YC		#BAR YD		#BAR YE		#BAR YF		#BAR YG		#BAR YH		#BAR YI		#BAR YJ		#BAR YK		#BAR YL		#BAR YM		#BAR YN		#BAR YO		#BAR YP		#BAR YQ		#BAR YR		#BAR YS		#BAR YT		#BAR YU		#BAR YV		#BAR YW		#BAR YX		#BAR YY		#BAR YZ		#BAR ZA		#BAR ZB		#BAR ZC		#BAR ZD		#BAR ZE		#BAR ZF		#BAR ZG		#BAR ZH		#BAR ZI		#BAR ZJ		#BAR ZK		#BAR ZL		#BAR ZM		#BAR ZN		#BAR ZO		#BAR ZP		#BAR ZQ		#BAR ZR		#BAR ZS		#BAR ZT		#BAR ZU		#BAR ZV		#BAR ZW		#BAR ZX		#BAR ZY		#BAR ZZ	

APPROVED BY:
Demetrius D. White
CHIEF ENGINEER
1-1-78
DATE

CC-S-M-4-6-S-45°-I

F.A.P.	STATE PROJECT	PARISH	SHEET NO.
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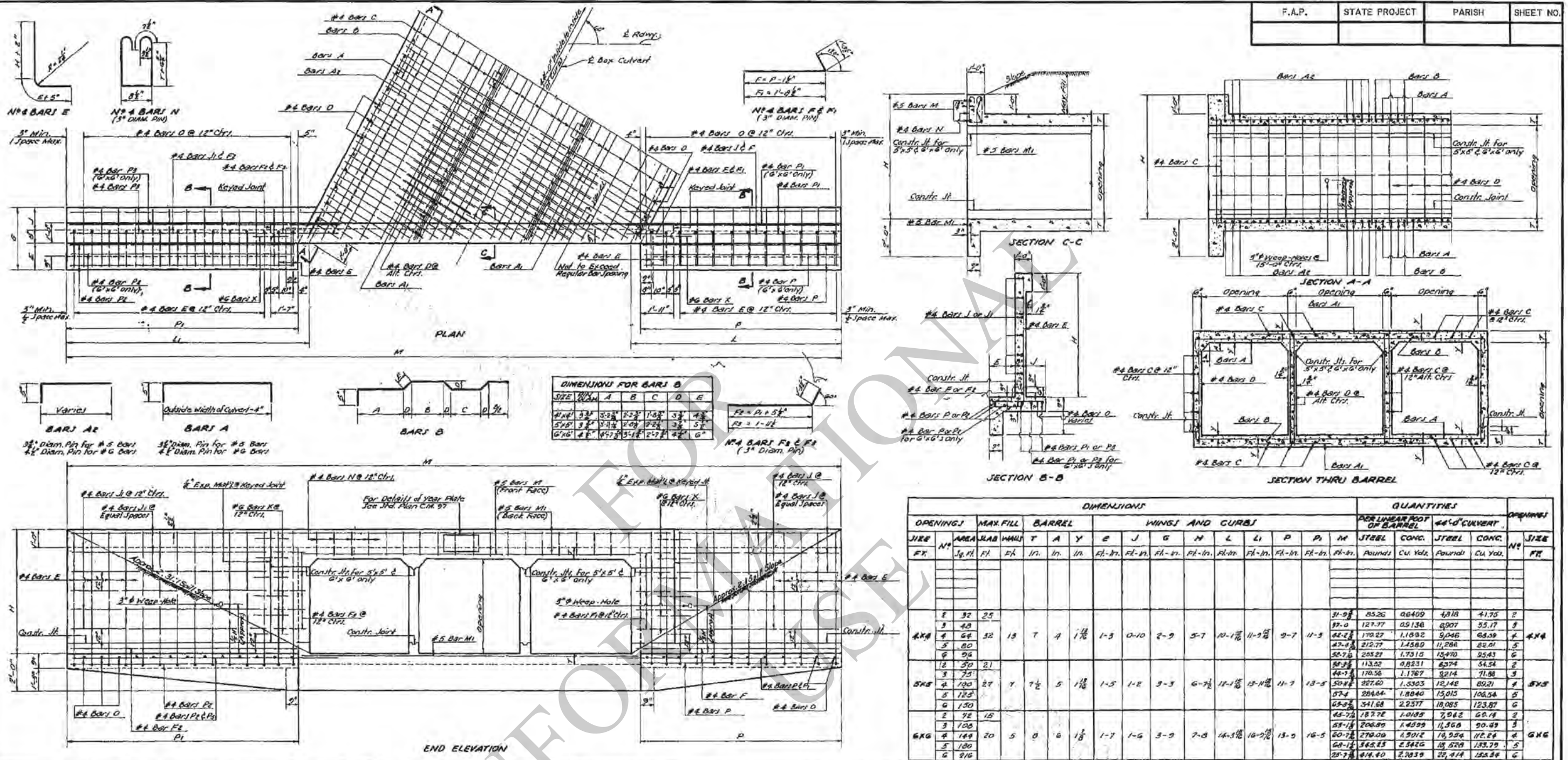
DIMENSIONS FOR BARS B					
SIZE	WIDTH	A	B	C	D
4x4	3' 3 1/2"	3' 1 1/2"	3' 1 1/2"	3' 1 1/2"	3' 1 1/2"
5x5	3' 4 1/2"	3' 1 1/2"	3' 1 1/2"	3' 1 1/2"	3' 1 1/2"
6x6	4' 0"	3' 1 1/2"	3' 1 1/2"	3' 1 1/2"	3' 1 1/2"

DIMENSIONS														QUANTITIES				OPENINGS				
OPENINGS		MAX. FILL		BARREL		WINGS AND CURBS								PER LIN. FT. OF BARREL		44'-0" CULVERT		OPENINGS				
SIZE	No.	AREA	SLAB	WALLS	T	A	Y	E	J	G	H	L	L ₁	P	P ₁	M	STEEL	CONCRETE	STEEL	CONCRETE	No.	Feet
Feet		Sq. Ft.	Ft.	Ft.	In.	In.	In.	Ft.-In.	Ft.-In.	Ft.-In.	Ft.-In.	Ft.-In.	Ft.-In.	Ft.-In.	Ft.-In.	Ft.-In.	Pounds	Cu. Yds.	Pounds	Cu. Yds.		
4x4		E 32	25														367 1/2	85.26	0.6409	4373	49.60	2
		S 48															421 1/2	127.77	0.9136	7117	57.34	3
		G 64	32	13	7	4	1 1/2	1-3	0-10	2-9	5-7	10-5 1/2	14-1 1/2	9-9	13-5		493 1/2	170.27	1.1862	9539	77.07	4
		S 60															55-0 1/2	128.99	1.4589	11652	84.82	5
		G 96															62-0 1/2	235.27	1.7915	14015	98.55	6
5x5		E 50	21														44-5 1/2	113.52	0.8231	6378	37.21	2
		S 96															52-2 1/2	170.56	1.1767	9504	74.84	3
		G 120	37	7	7 1/2	3	1 1/2	1-5	1-2	3-3	6-7 1/2	12-5 1/2	17-1 1/2	11-9	10-5		59-4 1/2	217.60	1.5303	12517	92.68	4
		G 150															67-5 1/2	294.04	1.9940	15716	104.40	5
		E 72	15														52-3 1/2	137.72	1.0185	8184	72.23	2
		S 100															61-5 1/2	206.89	1.4639	11750	84.20	3
		G 144	20	5	8	6	1 1/2	1-7	1-6	3-9	7-8	14-5 1/2	20-1 1/2	13-3	10-5		70-7 1/2	276.06	1.8012	15468	116.23	4
		S 180															79-10	343.23	2.3426	18390	138.32	5
		G 216															85-0 1/2	414.40	2.7039	23403	160.33	6

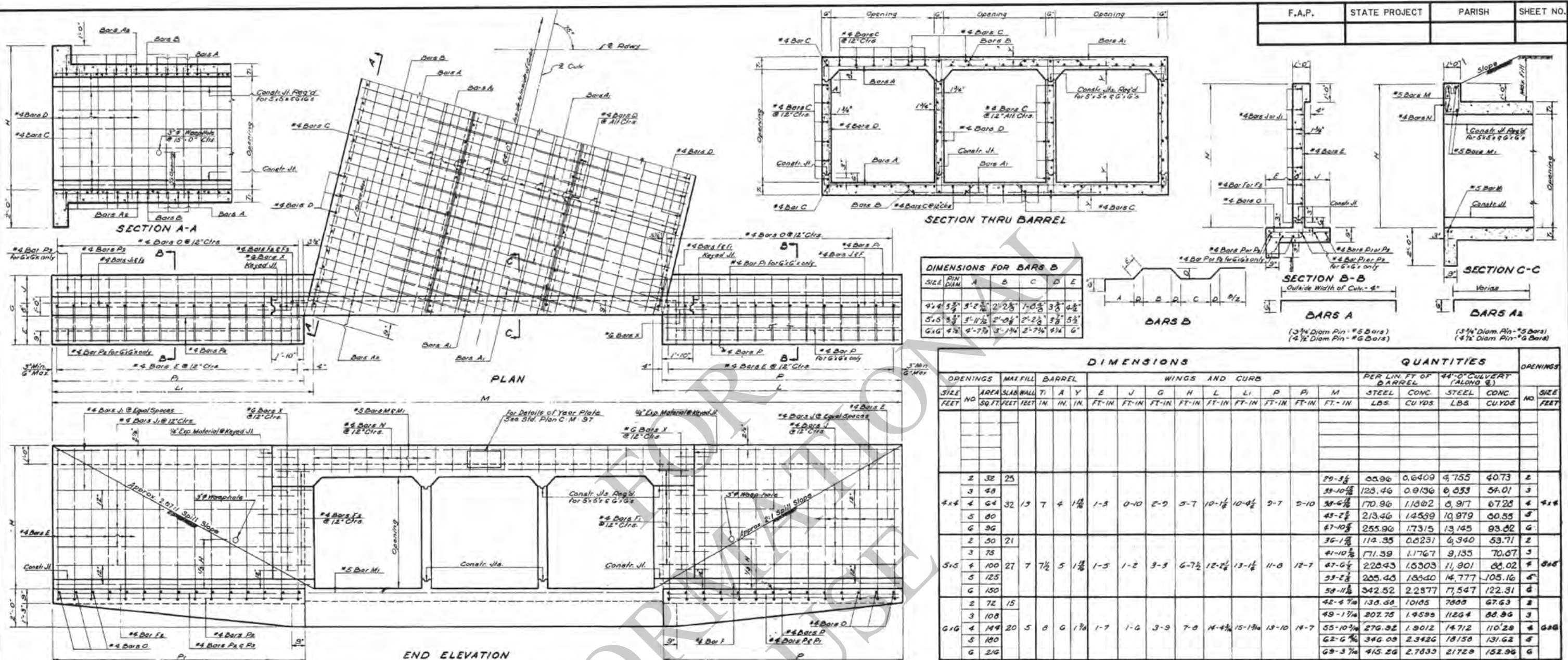
BILL OF REINFORCING STEEL FOR 44'-0" CULVERT

OPENINGS		BARREL REINFORCEMENT																								CURB AND WING REINFORCEMENT																								A																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																				
SIZE	No.	BARS A				BARS A1				BARS A2				BARS B				#4 BARS C		#4 BARS D		#4 BARS E		#4 BARS F		#4 BARS F1		#4 BARS F2		#4 BARS F3		#4 BARS J		#4 BARS J1		#4 BARS O		#4 BARS P		#4 BARS P1		#4 BARS P2		#4 BARS P3		#4 BARS N		#5 BARS M		#5 BARS M1		#6 BARS																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																		
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F.A.P.	STATE PROJECT	PARISH	SHEET NO.

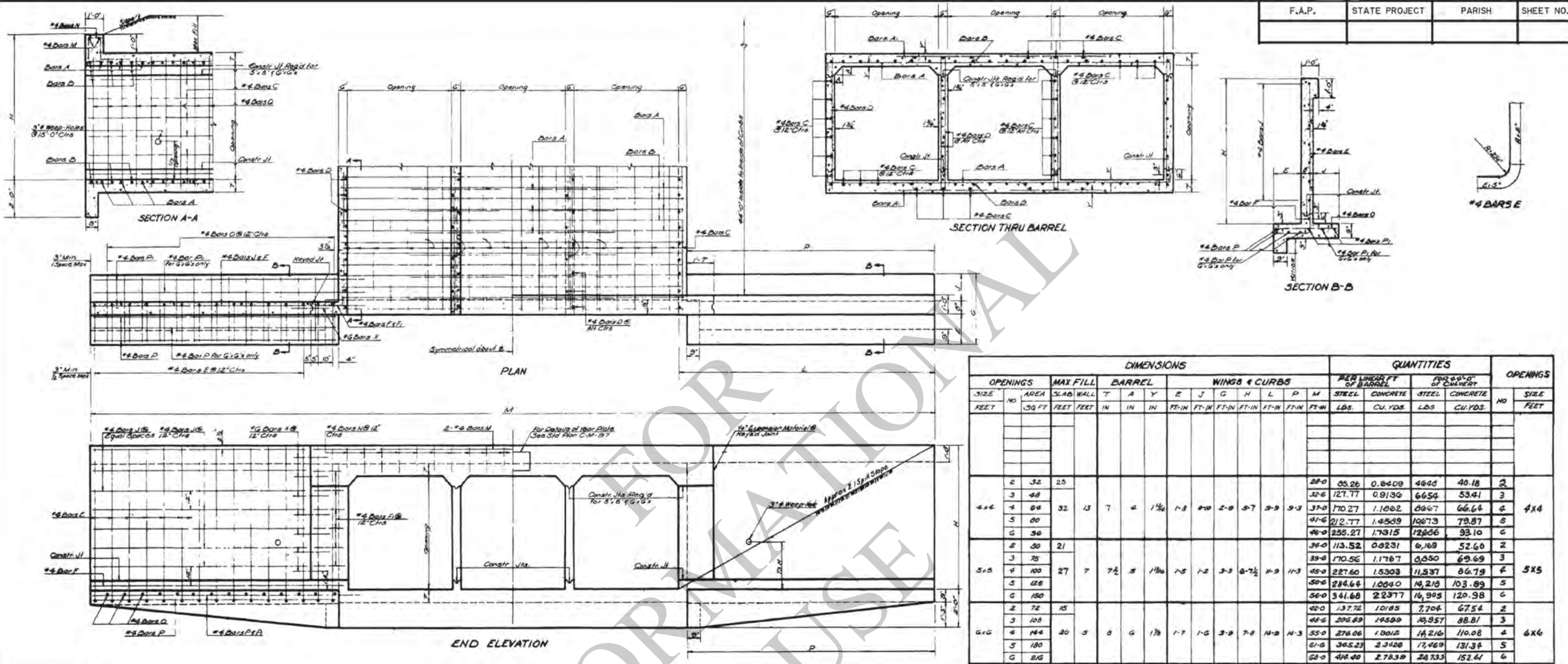


BILL OF REINFORCING STEEL FOR 44'-0" CULVERT																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																		
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BILL OF REINFORCING STEEL FOR 44'-0" CULVERT

OPENINGS		BARREL REINFORCEMENT																WINGS AND CURBS REINFORCEMENT																								A																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																						
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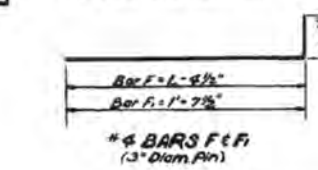
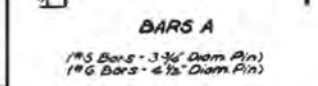
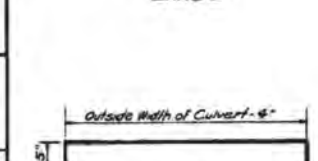
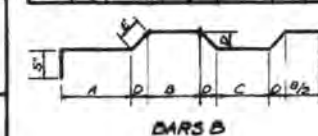


BILL OF REINFORCING STEEL FOR 44'-0" CULVERT																																								
OPENINGS		BARREL REINFORCEMENT																WING AND CURB REINFORCEMENT																(A)	OPENINGS					
SIZE	NO	BARS A				BARS A1				BARS B				BARS C		BARS D		BARS E		BARS F		BARS F1		BARS J		BARS N		BARS N		BARS O		BARS P		BARS R		BARS X		NO	SIZE	
		NO	SIZE	NO	LENGTH	SPAC	NO	SIZE	NO	LENGTH	SPAC	NO	SIZE	NO	LENGTH	SPAC	NO	LENGTH	NO	LENGTH	NO	LENGTH	NO	LENGTH	NO	LENGTH	NO	LENGTH	NO	LENGTH	NO	LENGTH	NO	LENGTH	NO	LENGTH				
FEET				FT-IN.	IN.				FT-IN.	IN.				FT-IN.	IN.				FT-IN.	IN.				FT-IN.	IN.				FT-IN.	IN.				FT-IN.	IN.				FEET	
4'x4'	2	5	92	10-0	12	5	92	3-10	12	5	92	11-2 1/2	12	39	47-5	138	4-10	12	40	7-5	4	10-8	15	2-11	20	7-6	4	12-1	20	4-8	36	5-4	13	8-11	8	10-7	20	2-0	2	
	3	5	92	14-6	12	5	104	3-10	12	5	92	11-1 1/2	12	56	47-5	184	4-10	12	40	7-5	4	10-8	15	2-11	20	7-6	4	16-7	24	4-8	36	5-4	13	8-11	8	10-7	20	2-0	3	
	4	5	92	19-0	12	5	176	3-10	12	5	92	13-0 1/2	12	74	47-5	230	4-10	12	40	7-5	4	10-8	15	2-11	20	7-6	4	21-1	38	4-8	36	5-4	13	8-11	8	10-7	20	2-0	4	4'x4'
	5	5	92	23-6	12	5	248	3-10	12	5	92	14-5	12	92	47-5	286	4-10	12	40	7-5	4	10-8	15	2-11	20	7-6	4	25-7	46	4-8	36	5-4	13	8-11	8	10-7	20	2-0	5	
	6	5	92	28-0	12	5	320	3-10	12	5	92	15-7 1/2	12	110	47-5	322	4-10	12	40	7-5	4	10-8	15	2-11	20	7-6	4	30-1	56	4-8	36	5-4	13	8-11	8	10-7	20	2-0	6	
	5'x5'	2	5	104	12-0	10	5	110	4-4	10	5	110	12-3 1/2	10	65	47-5	138	5-11	12	48	8-7 1/2	4	12-8	20	2-11	24	3-4	4	14-1	24	4-10	44	2-10	13	10-11	8	12-7	24	2-0	2
	3	5	110	17-6	10	5	166	4-4	10	5	110	18-0 1/2	10	66	47-5	164	5-11	12	48	8-7 1/2	4	12-8	20	2-11	24	3-4	4	19-7	36	4-10	44	2-10	13	10-11	8	12-7	24	2-0	3	
	4	5	110	23-0	10	5	230	4-4	10	5	110	23-8 1/2	10	67	47-5	194	5-11	12	48	8-7 1/2	4	12-8	20	2-11	24	3-4	4	25-1	46	4-10	44	2-10	13	10-11	8	12-7	24	2-0	4	5'x5'
	5	5	110	28-6	10	5	290	4-4	10	5	110	29-7	10	108	47-5	216	5-11	12	48	8-7 1/2	4	12-8	20	2-11	24	3-4	4	30-7	56	4-10	44	2-10	13	10-11	8	12-7	24	2-0	5	
	6	5	110	33-0	10	5	350	4-4	10	5	110	35-4 1/2	10	129	47-5	242	5-11	12	48	8-7 1/2	4	12-8	20	2-11	24	3-4	4	36-1	68	4-10	44	2-10	13	10-11	8	12-7	24	2-0	6	
6'x6'	2	5	126	14-0	14	5	140	5-2	14	5	126	14-3 1/2	14	52	47-5	165	7-0	10	60	3-10	4	15-8	24	2-11	28	12-4	4	16-1	28	4-11	56	3-4	16	13-11	12	15-7	28	2-0	2	
	3	5	126	20-6	14	5	196	5-2	14	5	126	21-1	14	75	47-5	220	7-0	10	60	3-10	4	15-8	24	2-11	28	12-4	4	22-7	40	4-11	56	3-4	16	13-11	12	15-7	28	2-0	3	
	4	5	126	27-0	14	5	254	5-2	14	5	126	27-1 1/2	14	100	47-5	245	7-0	10	60	3-10	4	15-8	24	2-11	28	12-4	4	29-1	54	4-11	56	3-4	16	13-11	12	15-7	28	2-0	4	6'x6'
	5	5	126	33-6	14	5	312	5-2	14	5	126	34-8	14	124	47-5	280	7-0	10	60	3-10	4	15-8	24	2-11	28	12-4	4	35-7	66	4-11	56	3-4	16	13-11	12	15-7	28	2-0	5	
	6	5	126	40-0	14	5	380	5-2	14	5	126	41-5 1/2	14	148	47-5	335	7-0	10	60	3-10	4	15-8	24	2-11	28	12-4	4	43-7	80	4-11	56	3-4	16	13-11	12	15-7	28	2-0	6	

© Includes 1'-0" Lap Splice.

(A) #6 Bars X to be 3/4" Smooth and Greased for 1'-0" of Length.

DIMENSIONS FOR BARS B					
SIZE	THICK.	A	B	C	D
4x4	3/4"	3'-2 1/2"	2'-2 1/2"	1'-0 1/2"	3/4"
5x5	3/4"	3'-11 1/2"	2'-0 1/2"	2'-2 1/2"	3/4"
6x6	3/4"	4'-7 1/2"	3'-1 1/2"	2'-7 1/2"	3/4"



GENERAL NOTES:

Construction Specifications: Latest Approved La. Dept. of Highways Standard Specifications.
Design Specifications: A.A.S. N.D. 1964 as amended by Int. Spec. 1964.
Live Load: HS 20-44 or Military Loading, whichever is greater.
All Concrete to be Class "A".
All Exposed Surfaces to have 1/4" Chamfer, unless otherwise noted.
Reinforcement shall be either Steel, A.S.T.M. A615 or Rail-Steel, A.S.T.M. A616 or A.S.T.M. A617.
Dimensions relating to Reinforcing Steel are for Bar Centers.
A 1'-6" Square of Plastic Filter Cloth (See Qualified Products List) shall be placed in contact with Concrete behind each Weep Hole, in addition to approx. 2 Cu. Ft. of Concrete Sand.
For Detail of Joints, See Std. Plan C.M.-48.

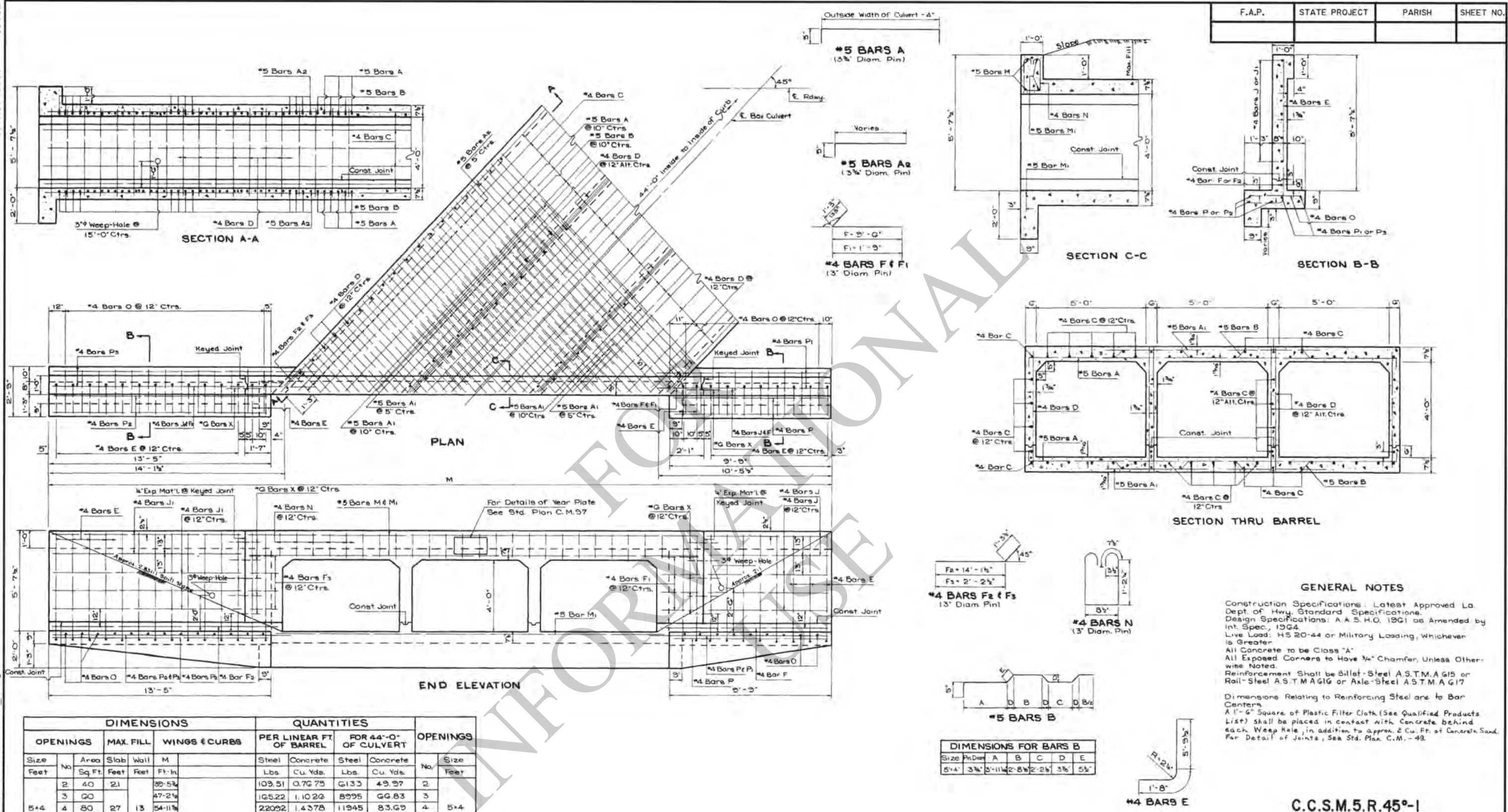
Approved by

Dennis D. V. R.
Chief Engineer

1-11-78
Date

STANDARD PLAN
MULTIPLE OPENINGS
REINFORCED CONCRETE BOX CULVERT
STRAIGHT HOWLS
2:1 SPILL SLOPE
4'x4' 5'x5' 6'x6'

STATE OF LOUISIANA
DEPARTMENT OF HIGHWAYS



DIMENSIONS						QUANTITIES				OPENINGS	
OPENINGS			MAX. FILL	WINGS & CURBS		PER LINEAR FT. OF BARREL		FOR 44'-0" OF CULVERT		OPENINGS	
Size	No.	Area	Slab	Wall	M	Steel	Concrete	Steel	Concrete	No.	Size
Feet		Sq. Ft.	Feet	Feet	Ft.-In.	Lbs.	Cu. Yds.	Lbs.	Cu. Yds.		Feet
5x4	2	40	21	13	35-5 1/2	109.51	0.7675	6133	49.37	2	5x4
	3	60			47-2 1/4	165.22	1.1026	8995	66.83	3	
	4	80			54-11 1/8	220.92	1.4378	11945	83.69	4	
	5	100			62-5 1/2	276.62	1.7729	15090	100.56	5	
	6	120			70-5 1/2	332.33	2.1080	18291	117.42	6	

[illegible]

① Includes 1-1'-G" Lap Splice

② Includes 1'-1'-10" Lap Splice

④ *G Borg x to be $3\frac{1}{2}$ " Smooth and Greased for 1'-0" of Length

C.C.S.M.5.R.45°-1

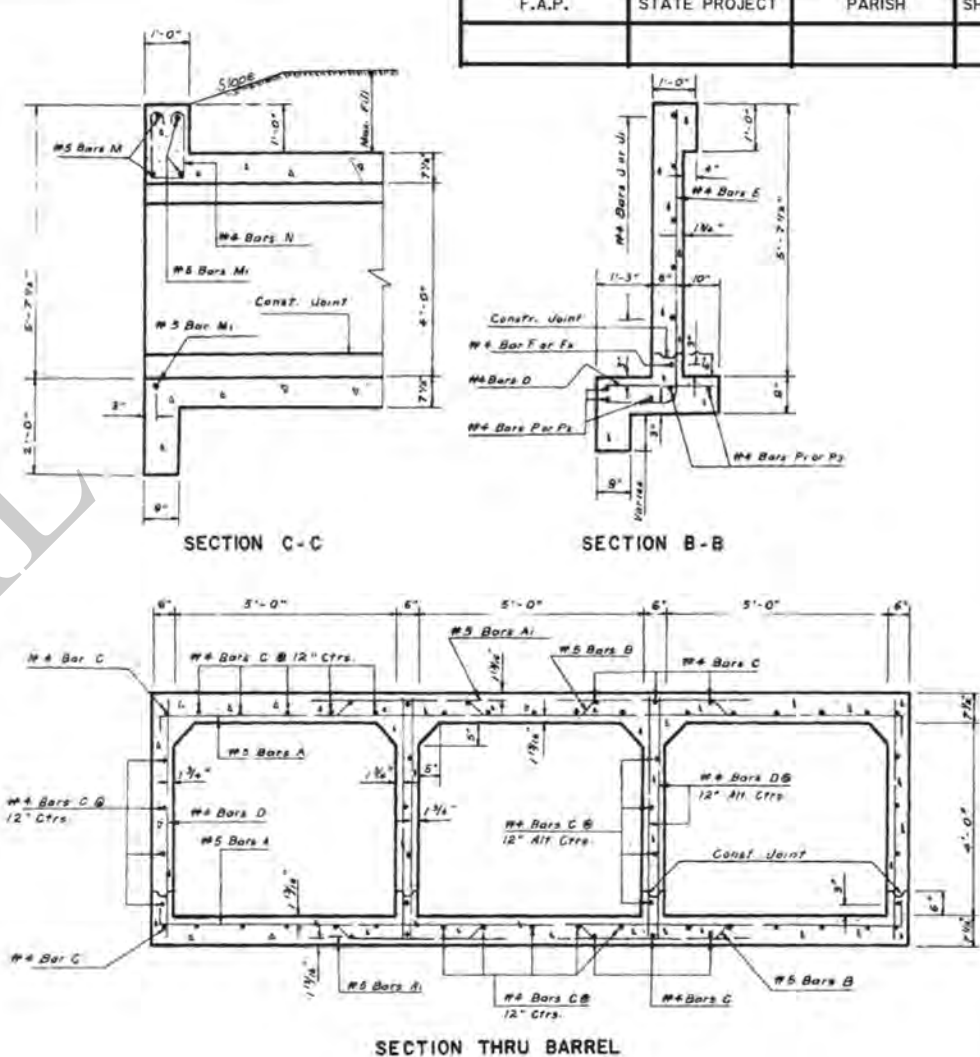
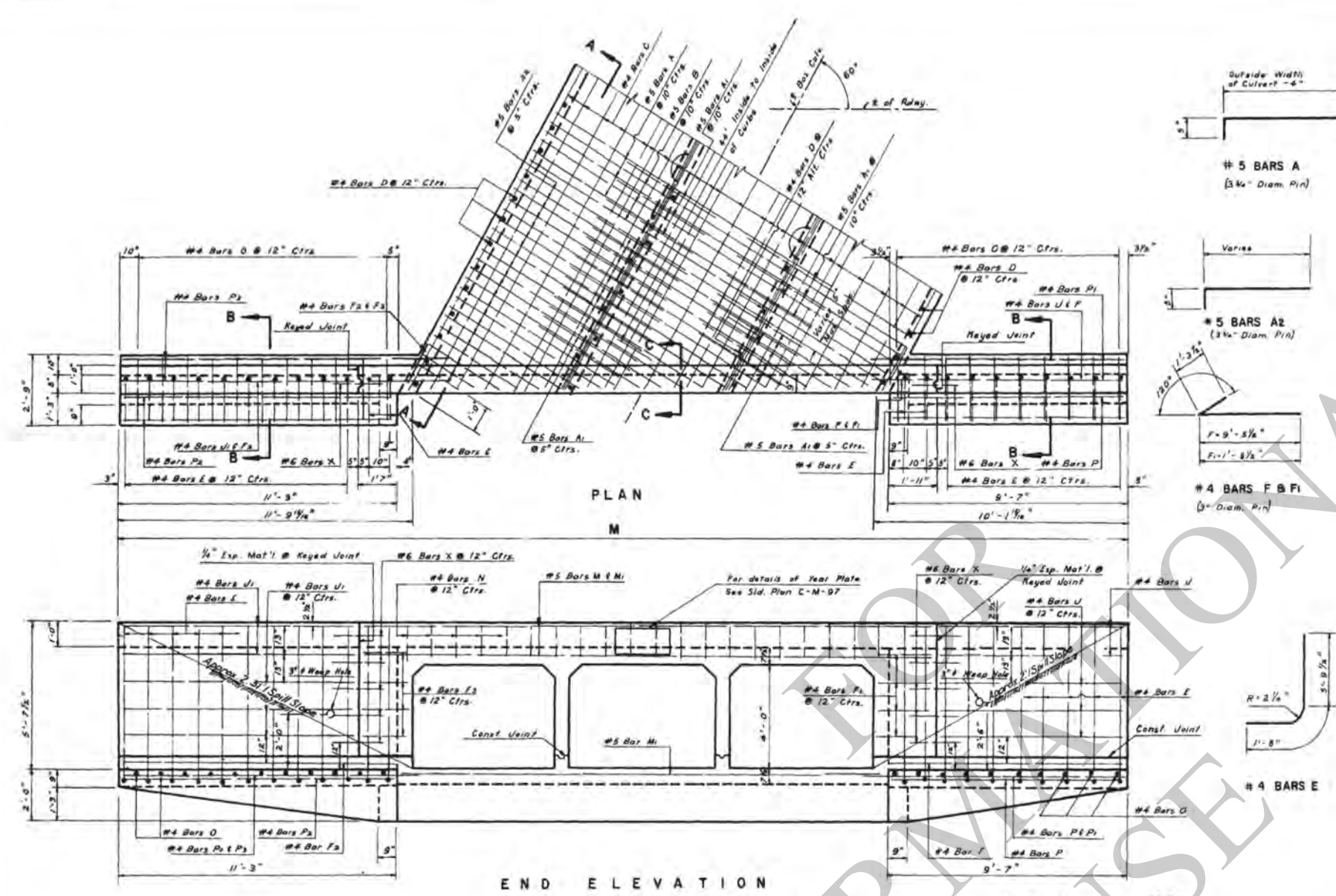
APPROVED BY: Dempsey D. White 1-5-78
CHIEF ENGINEER DATE

STANDARD PLAN
MULTIPLE OPENINGS
REINFORCED CONCRETE BOX CULVERTS
STRAIGHT WINGS 45° CROSSING
2:1 SPILL SLOPE NORMAL TO CHANNEL
DATED: Aug. 28, 1967 2 THRU 6 - 5' x 4'

STATE OF LOUISIANA DEPARTMENT OF HIGHWAYS		
DESIGNED W. E. M.	DETAILED A. P. Booz	TRACED E. S. Johnson
CHECKED N. K. B.	CHECKED B. L. Burke	CHECKED W. E. Marcum
IN CHARGE OF		

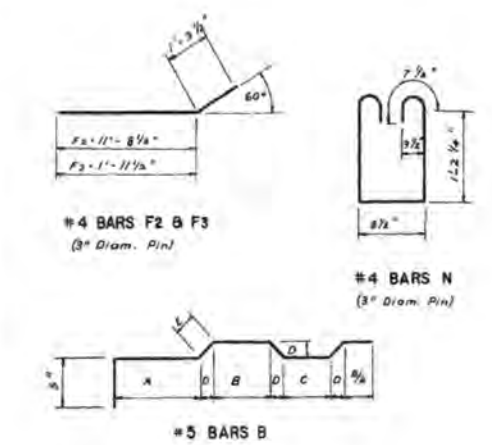
1-5-78	Rev. Weep Hole Note	W.T.
5-30-78	Revised Spill Slope	W.T.
6-8-72	Rev Gen. Notes For Stages	W.E.
DATE	DESCRIPTION	BY

REVISIONS



DIMENSIONS				QUANTITIES				OPENINGS
SIZE	NO.	AREA	MAX. FILL	WINGS & CURBS	PER LINEAR FT. OF BARREL	FOR 44'-0" OF CULVERT		
FEET		SQ. FT.	FEET	M	STEEL LBS.	CONCRETE CU. YDS.		NO. SIZE
5x4	2	40	21	34 - 1 1/4"	109.51	0.7675	5967	47.97
	3	60		40 - 5/8"	165.22	1.1028	8745	64.45
	4	80	27	46 - 9/16"	220.92	1.4378	11610	80.92
	5	100		53 - 2"	276.62	1.7729	14421	97.40
	6	120		59 - 6 3/4"	332.33	2.1080	17429	113.88

BILL OF REINFORCING STEEL FOR 44'-0" CULVERT																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																											
SIZE		BARREL REINFORCEMENT												WINGS AND CURBS REINFORCEMENT																OPENINGS																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																													
		#5 BARS A		#5 BARS A1		#5 BARS A2		#5 BARS B		#4 BARS C		#4 BARS D		#4 BARS E		#4 BARS F		#4 BARS F1		#4 BARS F2		#4 BARS F3		#4 BARS J		#4 BARS K		#4 BARS O				#4 BARS P		#4 BARS P1		#4 BARS P2		#4 BARS P3		#5 BARS M		#5 BARS M1		#4 BARS N		#6 BARS X (A)																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																													
SIZE	FEET	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH



DIMENSIONS FOR BARS B					
SIZE	PIN DIAM.	A	B	C	D
5'x4'	3/8"	3'-11 1/16"	2'-8 1/8"	2'-2 1/8"	3 3/8"

GENERAL NOTES

Construction Specification: Latest approved La. Dept. of Hwy. Standard Specification.
Design Specifications: A.A.S.H.O. 1961 as amended by Int. Spec. 1964.
Live Load: HS 20-44 or Military loading, whichever is greater.
All concrete to be Class "A".
All exposed corners to have 3/4" Chamfer, unless otherwise noted.
Reinforcement shall be Billet-Steel A.S.T.M. A 615 or Rail-Steel A.S.T.M. A 616 or Axle-Steel A.S.T.M. A 617.
Dimensions relating to Reinforcing Steel are to Bar centers.
A 1'-6" Square of Plastic Filter Cloth (See Qualified Products List) shall be placed in contact with Concrete behind each Weep Hole, in addition to approx. 2 Cu. Ft. of Concrete Sand.
For Detail of Joints, See Std. Plan C-M, -49.

CC-S-M-5-R-60°-1

Dampy D. White 1-5-78
CHIEF ENGINEER DATE

STANDARD PLAN
MULTIPLE OPENINGS
REINFORCED CONCRETE BOX CULVERTS
STRAIGHT WINGS 60° CROSSING
2:1 SPILL SLOPE NORMAL TO CHANNEL
2 THRU 6-5'x4'

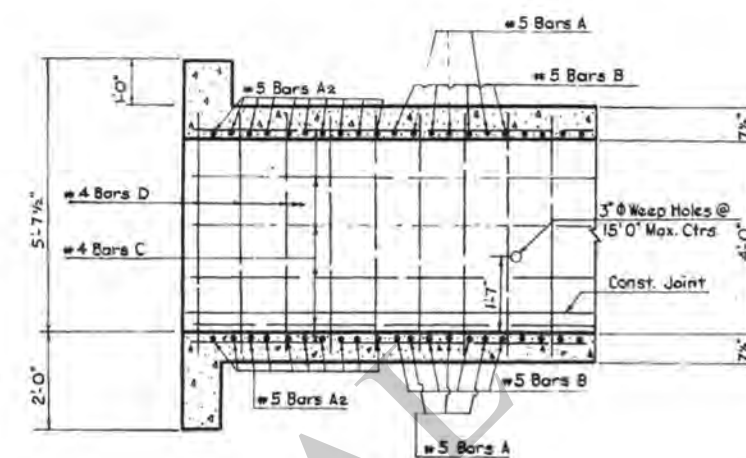
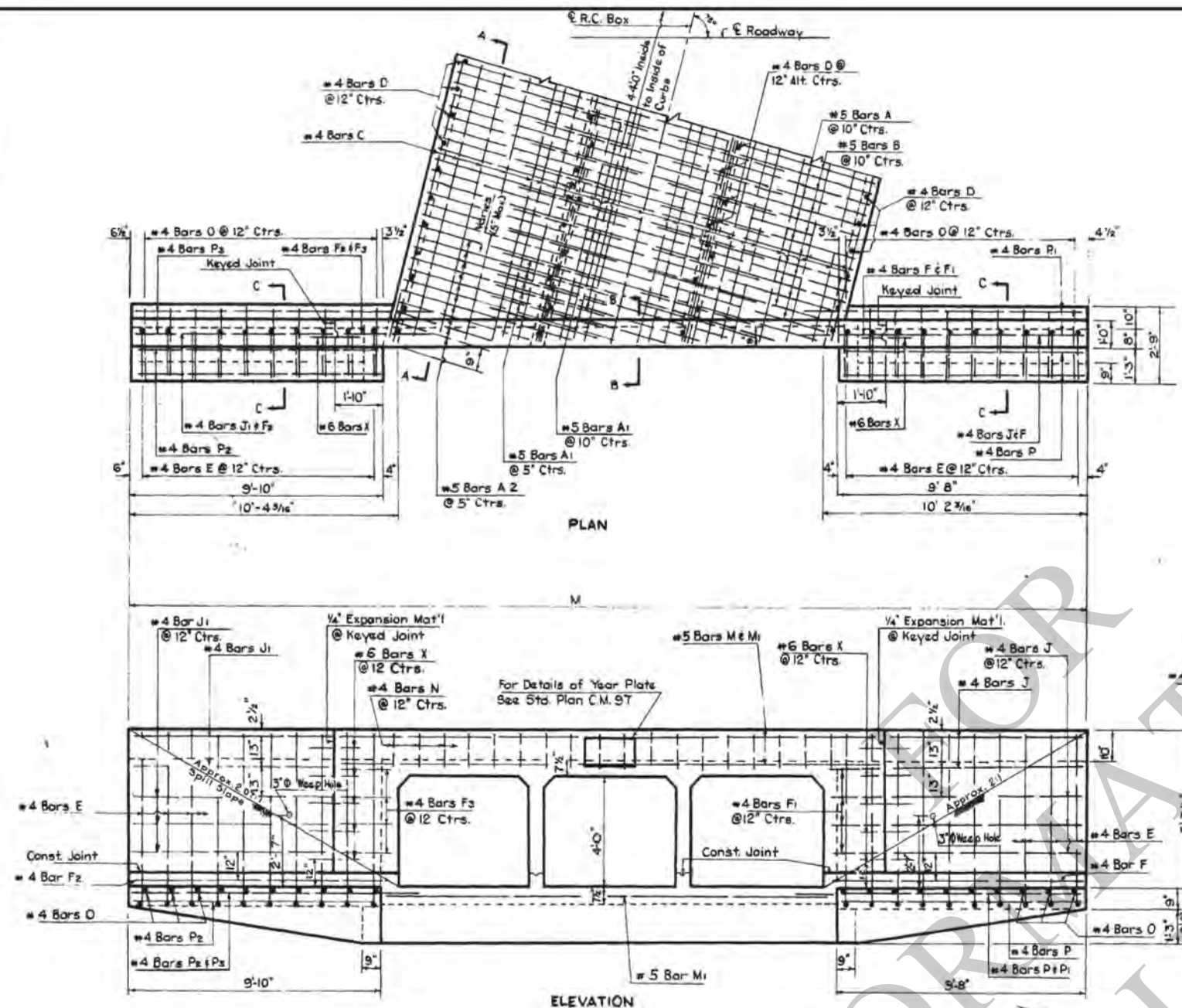
DATED: September 22, 1967

STATE OF LOUISIANA
DEPARTMENT OF HIGHWAYS

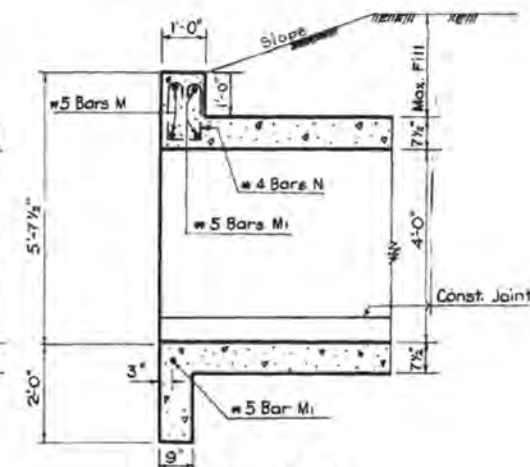
DESIGNED W.E. Marcum	DETAILED B.L. Burke	THROCK C. Brubaker
CHECKED N.K. Brown	CHECKED W.E. Marcum	CHECKED W.E. Marcum
IN CHARGE OF		

DATE	DESCRIPTION	BY
1-5-78	Rev. Weep Hole Note	W.T.J.
2-10-78	Rev. Slope Intercept	W.T.J.
6-8-78	Rev. General Notes for other	W.E.M.

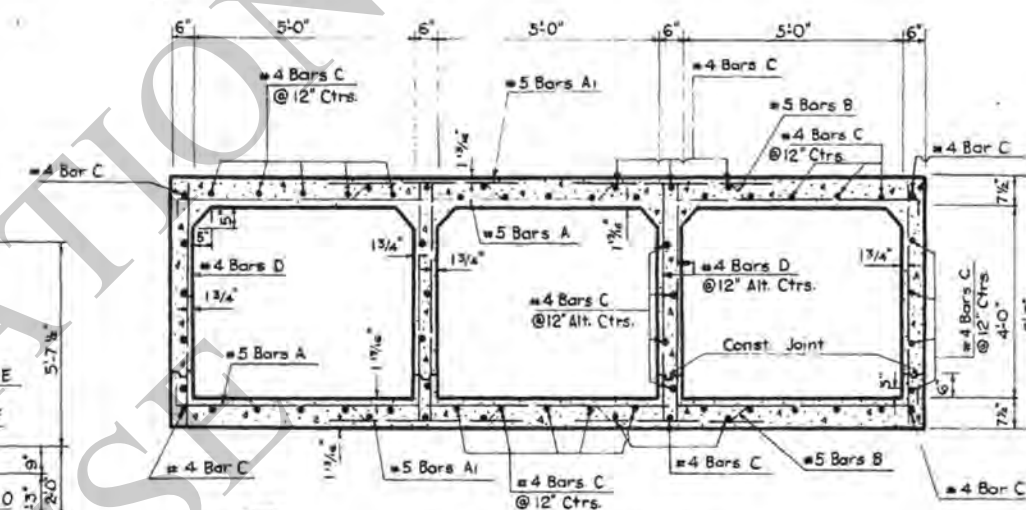
F.A.P.	STATE PROJECT	PARISH	SHEET NO.



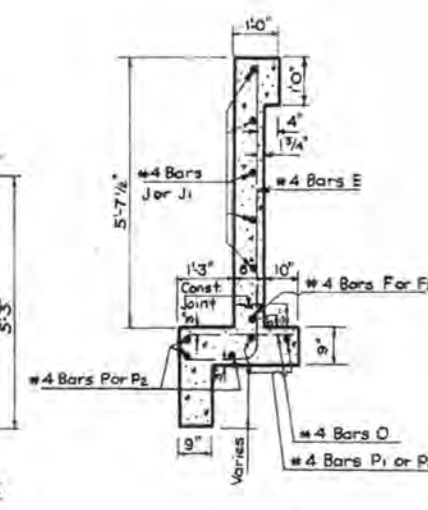
SECTION A-A



SECTION B-B

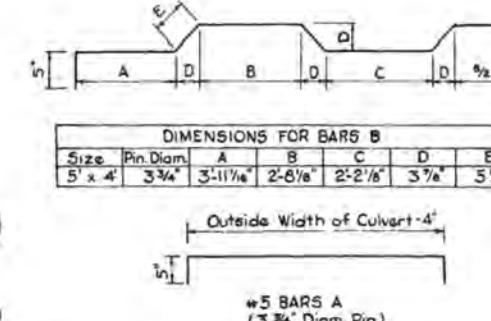
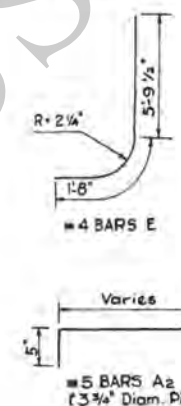
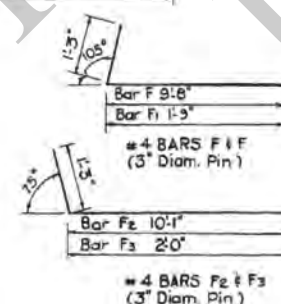


SECTION THRU BARREL



SECTION C-C

DIMENSIONS					QUANTITIES					OPENINGS	
OPENINGS			MAX. FILL		WINGS & CURBS	PER LINEAR FOOT OF BARREL		FOR 44'-0" OF CULVERT		OPENINGS	
SIZE	NO.	AREA	SLAB	WALL	M	STEEL	CONCRETE	STEEL	CONCRETE	NO.	SIZE
FEET		SQ. FT.	FEET	FEET	FEET-INCHES	LBS.	CU. YDS.	LBS.	CU. YDS.		FEET
5 x 4	2	40	21	13	31 - 4 7/8	109.51	0.7675	5877	46.93	2	5 x 4
	3	60			37 - 1 3/4	165.22	1.1026	8610	63.23	3	
	4	80	27		42 - 9 1/2	220.92	1.4378	11314	79.52	4	
	5	100			48 - 5 1/2	276.62	1.7729	14125	95.82	5	
	6	120			54 - 2 3/4	332.33	2.1080	16832	112.12	6	



GENERAL NOTES

Construction Specifications: Latest Approved: La. Dept. of Hwy. Standard Specifications.
Design Specifications: A.A.S.H.O. 1969 as Amended by Int. Specs., 1972.
Live Load: HS 20-44 or Military Loading, Whichever is Greater.
All Concrete to be Class "A".
All Exposed Corners to have $\frac{3}{4}$ " Chamfer, Unless Otherwise Noted.
Reinforcement Shall be Billet Steel A.S.T.M. A615 or Rail Steel A.S.T.M.A. 616 or Axle Steel A.S.T.M.A. 617.
Dimensions relating to Reinforcing Steel are to Bar Centers.
A 1'-0" Square of Plastic Filter Cloth (See Qualified Products List) shall be placed in contact with the Concrete behind each Weep Hole, in addition to approx. 2 Cu. Ft. of Concrete Sand-For Detail of Joints, See Std. Plan C.M.-49.

[illegible]

① Includes 1-1'-6" Lap Splice

④ *6 Bars X to be $\frac{3}{4}" \phi$ Smooth & Greased for 1'-0" of Length.

C.C.S.M. 5-R. 75° 1

APPROVED BY: Dempsey D. White 1-11-78
CHIEF ENGINEER DAT

STANDARD PLAN

**MULTIPLE OPENING
REINFORCED CONCRETE BOX CULVERT**
STRAIGHT WINGS 75° CROSSING
2:1 SPILL SLOPE NORMAL TO CHANNEL
DATE: Feb. 1973 2 THRU 6'-5" x 4'

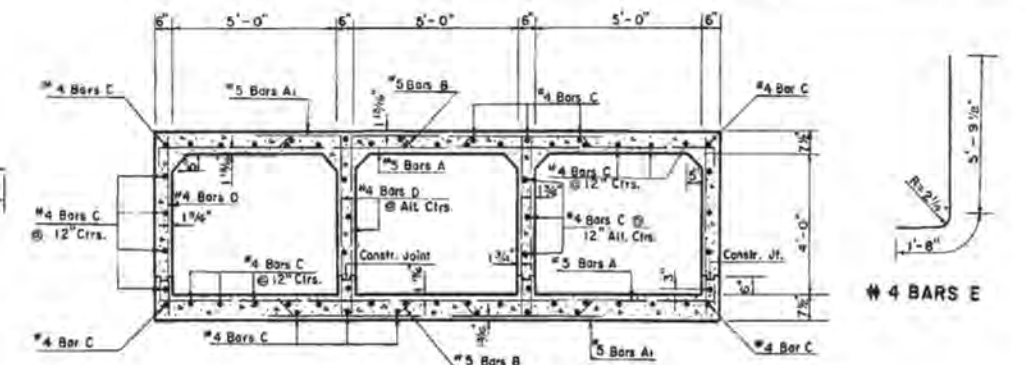
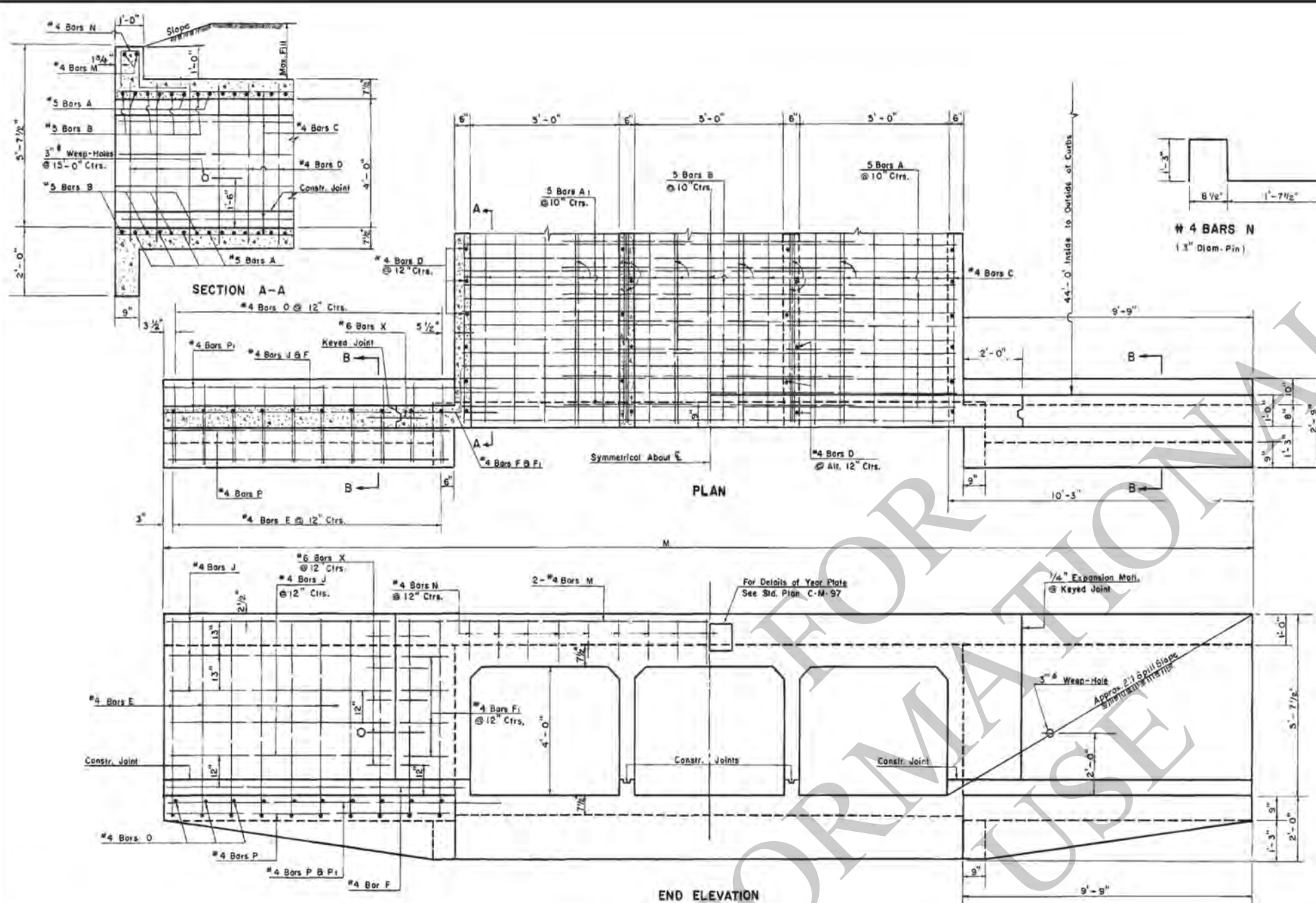
STATE OF LOUISIANA

DEPARTMENT OF HIGHWAYS

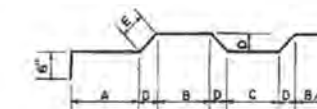
DESIGNED <i>W. Marquardt</i>	DETAILED <i>C. Johnston</i>	TRACED <i>Donna Knight</i>
CHECKED	CHECKED	CHECKED <i>CD-1</i>

1-11-78	Rev. Waap Hole Note
5-30-75	Revised Spill S/o
DATE	DESCR
	REVIS

W.T.
W.T.

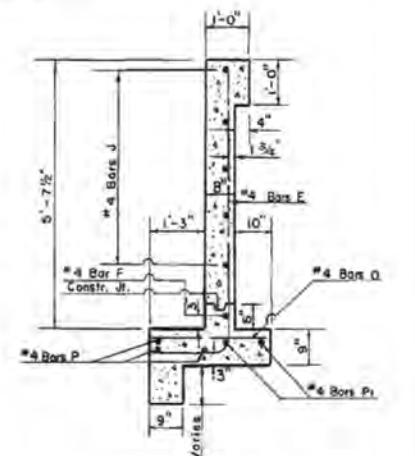


SECTION THRU BARREL

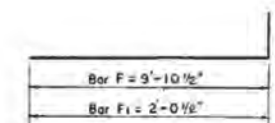
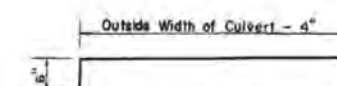


#5 BARS B

DIMENSION FOR BARS B					
SIZE	PIN	A	B	C	D E
5' X 4'	3/4"	3'-11 1/4"	2'-8 1/2"	2'-2 1/2"	3 3/8" 5 1/8"



SECTION B-B

#4 BARS F & F1
(3" Diam. Pin)#5 BARS A
(3 3/4" Diam. Pin)

DIMENSIONS						QUANTITIES				OPENINGS	
OPENINGS		MAX. FILL		WINGS & CURBS		PER LINEAR FT. OF BARREL		FOR 44'-0" OF CULVERT		OPENINGS	
SIZE	NO.	AREA	SLAB	WALL	M	STEEL	CONCRETE	STEEL	CONCRETE	NO.	SIZE
FEET		SQ. FT.	FEET	FEET	FT.-IN.	LBS.	CU. YDS.	LBS.	CU. YDS.		FEET
5 X 4	2	40	21		31-0	110.35	0.7675	5835	46.81	2	
	3	60			36-6	166.05	1.1026	8453	63.06	3	
	4	80			42-0	221.75	1.4377	11078	79.30	4	
	5	100			47-6	277.46	1.7729	13697	95.55	5	
	6	120			53-0	333.16	2.1080	16322	111.79	6	

BILL OF REINFORCING STEEL FOR 44'-0" CULVERT

OPENINGS		BARREL REINFORCEMENT										WINGS AND CURBS REINFORCEMENT														OPENING						
		#5 BAR A	#5 BARS A1	#5 BARS B	#4 BARS C	#4 BARS D	#4 BARS E	#4 BARS F	#4 BARS F1	#4 BARS J	#4 BARS M	#4 BARS N	#4 BARS O	#4 BARS P	#4 BARS P1	#6 BARS X																
SIZE	NO.	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	SIZE			
FEET			FT.-IN.		FT.-IN.		FT.-IN.		FT.-IN.		FT.-IN.		FT.-IN.		FT.-IN.		FT.-IN.		FT.-IN.		FT.-IN.		FT.-IN.		FT.-IN.		FT.-IN.		FEET			
5 X 4	2	110	12'-2	110	4'-4	110	12-5 3/4	42	47-2	138	4'-11	40	7-5 1/2	4	11-2	16	3-4	20	7-5	4	14-11	24	4'-10	40	2-4	12	9-5	8	11-1	20	2-0	2
	3	110	17'-8	220	4'-4	110	18-2 1/2	62	47-2	184	4'-11	40	7-5 1/2	4	11-2	16	3-4	20	7-5	4	20-5	34	4'-10	40	2-4	12	9-5	8	11-1	20	2-0	3
	4	110	23'-2	330	4'-4	110	23-11 3/4	82	47-2	230	4'-11	40	7-5 1/2	4	11-2	16	3-4	20	7-5	4	25-11	46	4'-10	40	2-4	12	9-5	8	11-1	20	2-0	4
	5	110	28'-8	440	4'-4	110	29-9	102	47-2	276	4'-11	40	7-5 1/2	4	11-2	16	3-4	20	7-5	4	31-5	56	4'-10	40	2-4	12	9-5	8	11-1	20	2-0	5
	6	110	34'-2	550	4'-4	110	35-6 1/4	122	47-2	322	4'-11	40	7-5 1/2	4	11-2	16	3-4	20	7-5	4	36-11	68	4'-10	40	2-4	12	9-5	8	11-1	20	2-0	6

① Includes One 1'-6" Lap Splice.

APPROVED BY:

CHIEF ENGINEER
1-11-78
DATE

① #6 Bars X to be 3/4" Smooth and Greased for 1'-0" of Length.

DATE	DESCRIPTION	BY
1-11-78	Rev. Weep Hole Note	W.T.U.
1-28-78	Rev. Slope Intersect	W.T.U.
6-8-72	Rev. General Notes for Steel	W.E.M.
9-5-67	Steel & Conc. Quant. Rev.	W.E.M.
5-2-67	Added Auto Steel	W.E.M.

General Notes:
Construction Specifications: Latest Approved L.A. Dept. of Highways Standard Specifications.
Design Specifications: A.A.S.H.O. 1961 as Amended by Int. Spec. 1964.
Live Load: HS 20-44 or Military Loading, Whichever is Greater.
All Concrete to be Class "A".
All Exposed Corners to Have 3/4" Chamfer, Unless Otherwise Noted.
Reinforcement Shall be Dillet-Steel A.S.T.M. A615 or Rail-Steel A.S.T.M. A616 or Axle-Steel A.S.T.M. A617.
Dimensions Relating to Reinforcing Steel are to Bar Centers.
A 1'-6" Square of Plastic Filter Cloth (See Qualified Products List) shall be placed in contact with Concrete behind each Weep Hole, in addition to approx. 2 Cu. Ft. of Concrete Sand.
For Detail of Joints, See Std. Plan C.M.-49.

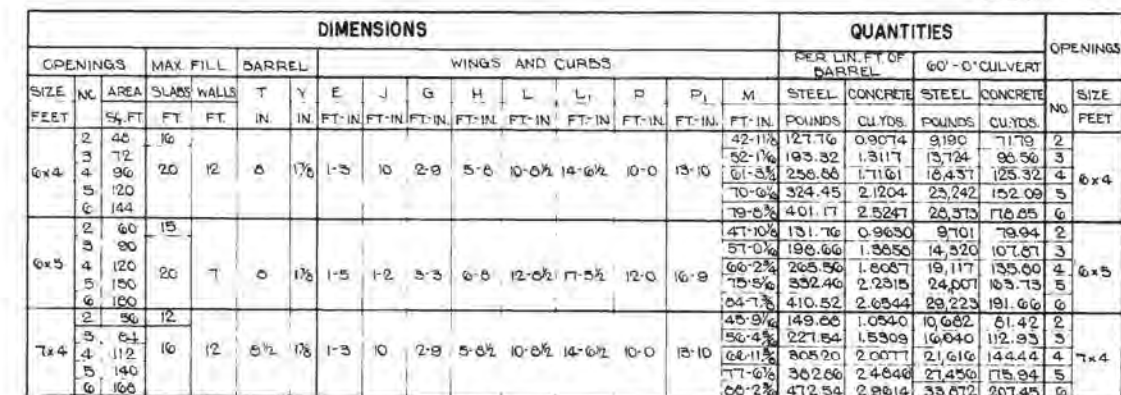
C.C.S.M. 5-R-902-1

STANDARD PLAN
MULTIPLE OPENINGS
REINFORCED CONCRETE BOX CULVERTS
STRAIGHT WINGS 2:1 SPILL SLOPE
2 THRU 6-5' X 4'

DATED Sept. 7, 1965

STATE OF LOUISIANA
DEPARTMENT OF HIGHWAYS

DESIGNED	W.E. Marcum	DETAILED	Edn J. Mortel	TRACED	E.P. Eichmeier
CHECKED	N.K. Brown	CHECKED	W.E. Marcum	CHECKED	Al Shows
IN CHARGE OF					



General Notes:
Construction Specifications: Latest Approved La. Dept.
of Highways Standard Specifications.
Design Specifications: A.A.S.H.O. 1924 as Amended by Int. Specs. 1964.
Live Load: HS 20-44 or Military; Whichever is Greater.
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Steel A.S.T.M. A616 or Axle-Steel A.S.T.M. A617.
Dimensions Relating to Reinforcing Steel are to Bar Centers.
A 1'-6" Square of Plastic Filter Cloth (See Qualified
Products List) shall be placed in contact with Concrete
behind each Weep Hole, in addition to approx. 2 Cu. Ft.
of Concrete Sand.
For Detail of Joints, See Std. Plan C.M. - 49.

STANDARD PLAN
MULTIPLE OPENINGS
REINF. CONCRETE BOX CULVERT
STRAIGHT WINGS 45° CROSSING
2:1 SPILL SLOPE, NORMAL TO CHANNEL

DEPARTMENT OF HIGHWAYS

NEO	DETAILED Exp. Marks	TRACED
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RECEIVED	RECEIVED	RECEIVED
CHECKED	CHECKED W. E. Grice	CHECKED W. E. Grice

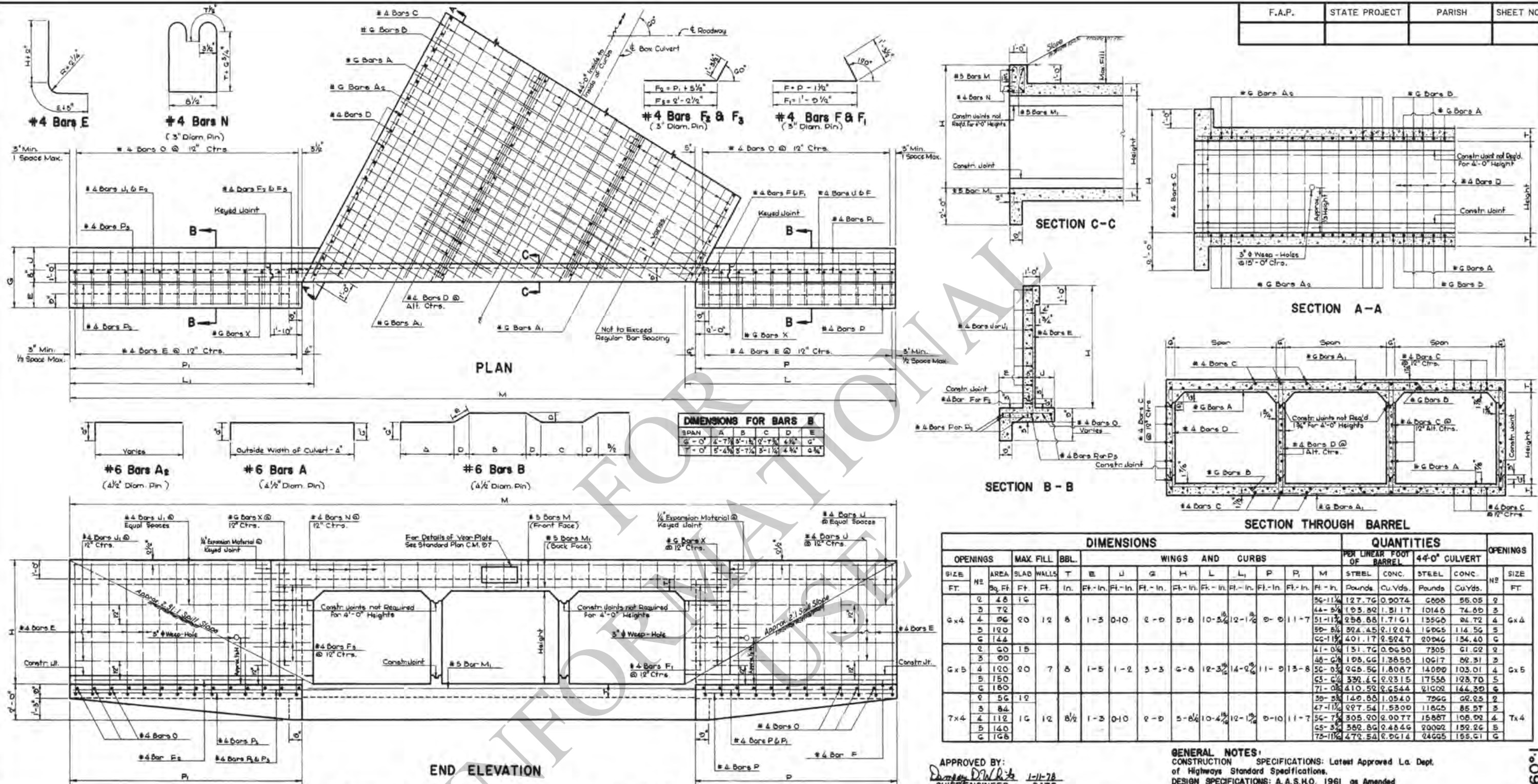
[illegible]

- ① Incl. One 1'-6" Lap Splice.
- ② Incl. One 2'-2" Lap Splice.
- ③ Does Not Incl. Lap Splice. When Bar Length Exceeds 40'-0" Add One 2'-2" Lap Splice.

④ 4 @ Bars X to be $\frac{3}{4}$ " ϕ Smooth and Greased for 1'-0" of Length

APPROVED BY: Dennis D. White 1-5-78
CHIEF ENGINEER DATE

1-5-79	Rev. Weap Hole Note	W.T.
6-10-75	Rev. Slope Intercept	W.T.
6-8-72	Rev. General Notes, Fly. Steel	W.E.
4-27-51	Added Asb. Steel	W.E.
DATE	DESCRIPTION	BY
REVISIONS		



APPROVED BY:
[Signature]
 CHIEF ENGINEER DATE 1-11-78

GENERAL NOTES:
 CONSTRUCTION SPECIFICATIONS: Latest Approved La. Dept. of Highways Standard Specifications.
 DESIGN SPECIFICATIONS: A.A.S.H.O. 1961 as Amended by Int. Spec. 1964
 LIVE LOAD: HS20-44 or Military, Whichever is Greater.
 All Concrete to be Class "A".
 All Exposed Corners to have 3/4" Chamfer, Unless Otherwise Noted.
 Reinforcement Shall be Billet-Steel A.S.T.M. A615 or Rail-Steel A.S.T.M. A616 or Axle-Steel A.S.T.M. A617.
 Dimensions Relating to Reinforcing Steel are to Bar Centers.
 Place about 2 Cu. Ft. of Large Size Gravel or Loose Rock A1'-6" Square of Plastic Filter Cloth (See Qualified Products List) shall be placed in contact with Concrete behind each Weep Hole, in addition to approx. 2 Cu. Ft. of Concrete Sand.
 For Detail of Joints, See Std. Plan C.M.-49.

④ Does not include Lap Splice. When Bar Length Exceeds 40'-0", Add 1'-2" Lap Splice.

BILL OF REINFORCING STEEL FOR 44'-0" CULVERT

BARREL REINFORCEMENT												WINGS AND CURBS REINFORCEMENT											
SIZE	NO.	Length	Spec.	NO.	Length	Spec.	NO.	Length	Spec.	NO.	Length	NO.	Length	Spec.	NO.	Length	Spec.	NO.	Length	Spec.	NO.	Length	Spec.
FT.		FT.-In.		FT.	FT.-In.		FT.	FT.-In.		FT.	FT.-In.	FT.	FT.-In.		FT.	FT.-In.		FT.	FT.-In.		FT.	FT.-In.	
G x 4	2	66	14-2	14	80	5-2	1	40	2-3	12	118	13-4	7	60	14-5 1/2	14	42	47-5	130	5-0	12		
	3	60	20-5	14	176	5-2	1	70	2-3	11	116	15-5	7	60	21-3	14	42	47-5	184	5-0	12		
	4	52	27-2	14	184	5-2	1	100	2-3	12	118	16-5	7	64	28-0 1/2	14	42	47-5	230	5-0	12		
	5	46	33-6	14	400	5-2	1	124	2-3	12	118	18-5	7	64	34-10	14	42	47-5	276	5-0	12		
	6	40	39-2	14	544	5-2	1	148	2-3	12	118	20-5	7	64	40-3 1/2	14	42	47-5	322	5-0	12		
G x 5	2	66	14-2	14	80	5-2	1	40	2-3	12	118	13-4	7	60	14-5 1/2	14	42	47-5	130	5-0	12		
	3	60	20-5	14	176	5-2	1	70	2-3	11	116	15-5	7	60	21-3	14	42	47-5	184	5-0	12		
	4	52	27-2	14	184	5-2	1	100	2-3	12	118	16-5	7	64	28-0 1/2	14	42	47-5	230	5-0	12		
	5	46	33-6	14	400	5-2	1	124	2-3	12	118	18-5	7	64	34-10	14	42	47-5	276	5-0	12		
	6	40	39-2	14	544	5-2	1	148	2-3	12	118	20-5	7	64	40-3 1/2	14	42	47-5	322	5-0	12		
T x 4	2	66	14-2	14	80	5-2	1	40	2-3	12	118	13-4	7	60	14-5 1/2	14	42	47-5	130	5-1	12		
	3	60	20-5	14	176	5-2	1	70	2-3	11	116	15-5	7	60	21-3	14	42	47-5	184	5-1	12		
	4	52	27-2	14	184	5-2	1	100	2-3	12	118	16-5	7	64	28-0 1/2	14	42	47-5	230	5-1	12		
	5	46	31-8	14	310	5-2	1	124	2-3	12	118	18-5	7	64	34-10	14	42	47-5	280	5-1	12		
	6	40	36-6	14	440	5-2	1	148	2-3	12	118	20-5	7	64	40-3 1/2	14	42	47-5	330	5-1	12		

① Includes 1'-1"-0" Lap Splice
 ② Includes 1'-2"-0" Lap Splice
 ③ Includes 1'-1"-10" Lap Splice
 ④ #6 Bars X to be 3/8" # Smooth and Greased For 1'-0" of Length

STANDARD PLAN
MULTIPLE OPENINGS
REINFORCED CONCRETE BOX CULVERTS
STRAIGHT WINGS
80° CROSSING
2:1 SPILL SLOPE NORMAL TO CHANNEL
 DATED DEC. 5, 1964
STATE OF LOUISIANA
DEPARTMENT OF HIGHWAYS

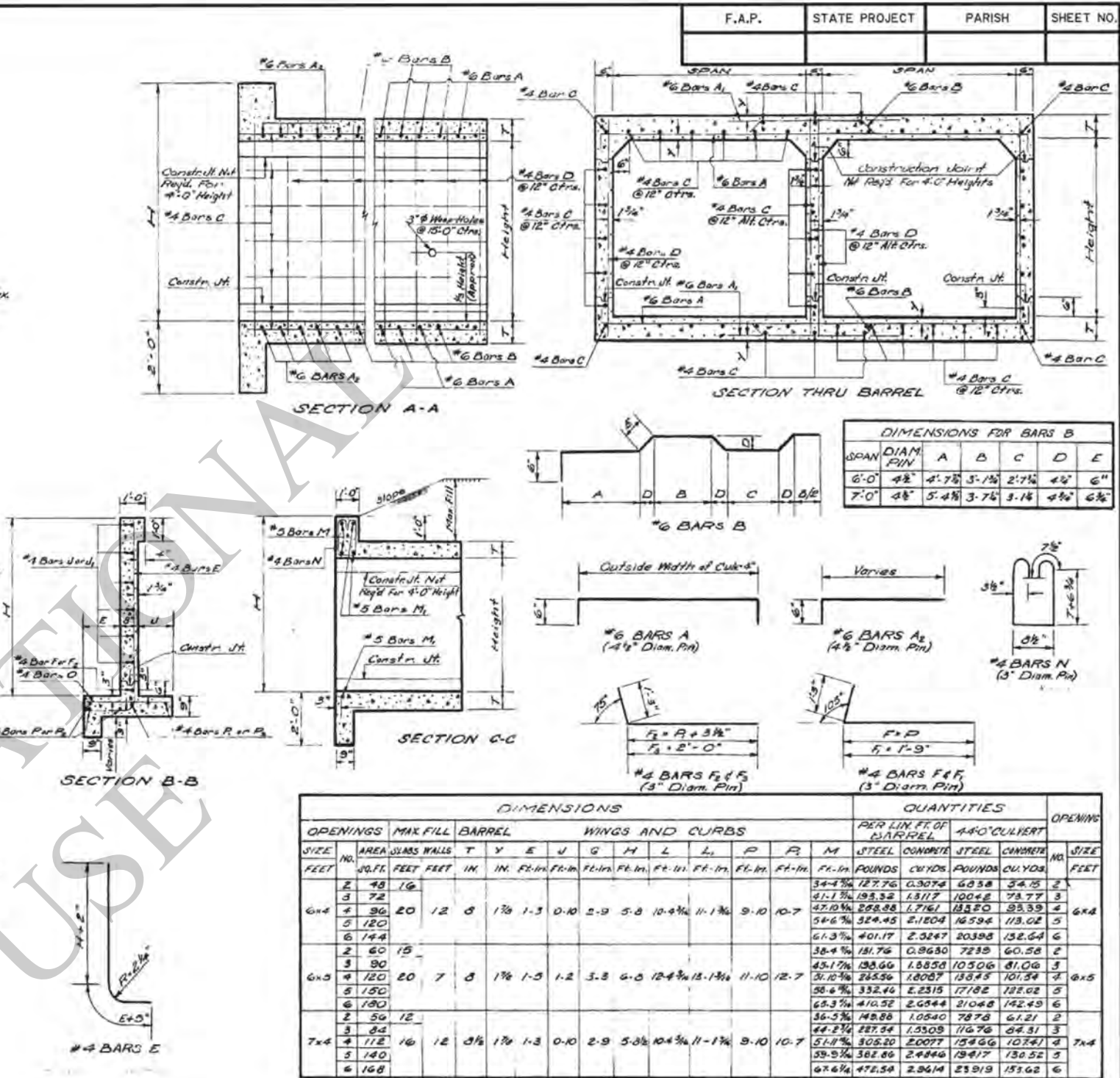
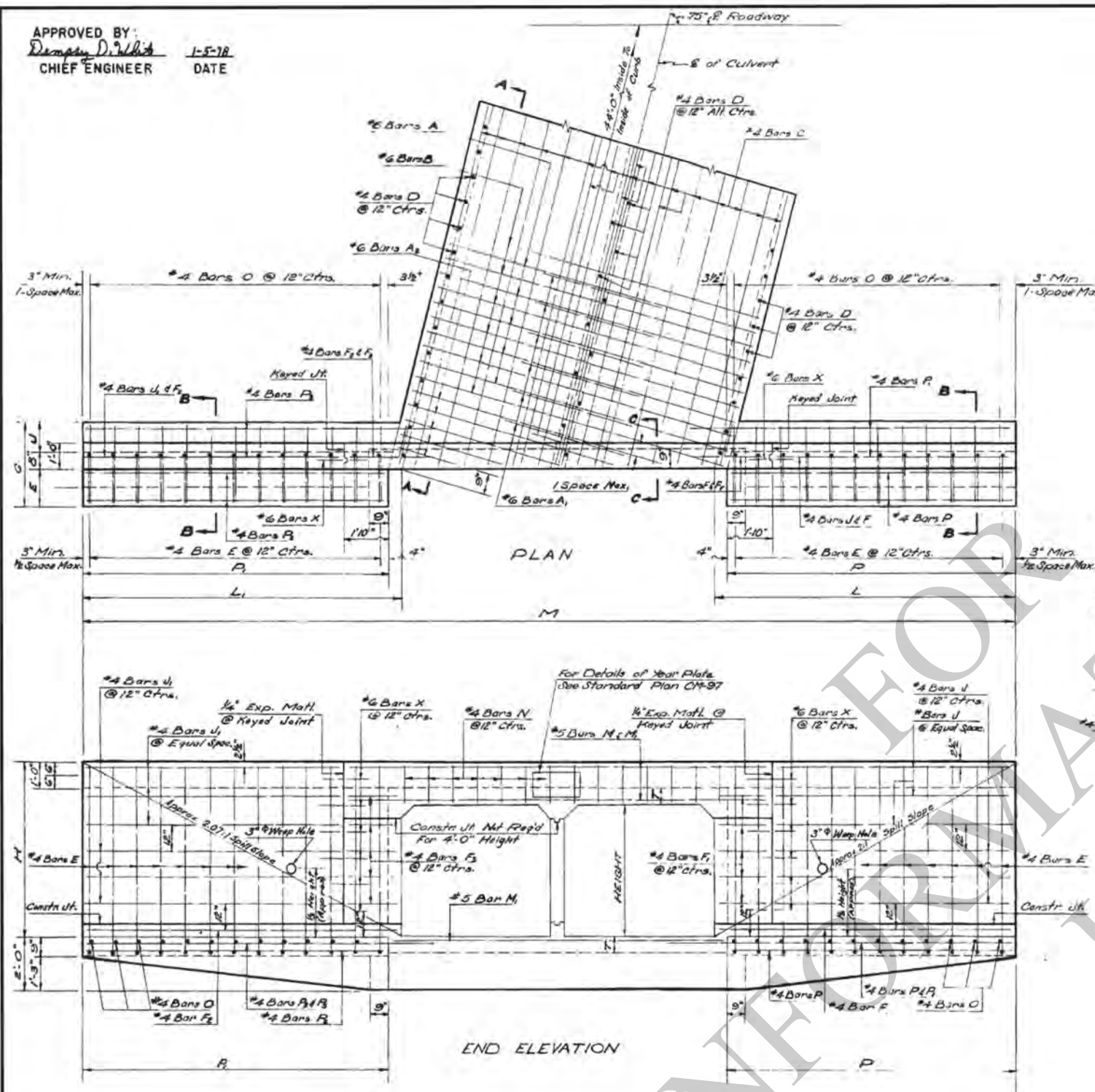
DESIGNED N.K.D.
 CHECKED W.E.M.
 IN CHARGE OF

DATE DESCRIPTION BY

REVISIONS

APPROVED BY:
Dempsey D. White
 CHIEF ENGINEER
 DATE: 1-5-78

F.A.P. STATE PROJECT PARISH SHEET NO.



DIMENSIONS										QUANTITIES				OPENING
SIZE	NO.	AREA	MAX FILL	BARREL	WINGS	AND CURBS	PER LIN. FT. OF	44'-0" CULVERT	STEEL CONCRETE	STEEL CONCRETE	STEEL CONCRETE	STEEL CONCRETE	STEEL CONCRETE	
FEET	NO.	FEET	FEET	FEET	FEET	FEET	FEET	FEET	FEET	FEET	FEET	FEET	FEET	FEET
2	48	16	12	8	17 1/2	1-3	0-10	2-9	5-8	10-4 1/2	11-1 1/2	9-10	10-7	6x4
3	72	20	12	8	17 1/2	1-3	0-10	2-9	5-8	10-4 1/2	11-1 1/2	9-10	10-7	6x4
4	96	20	12	8	17 1/2	1-3	0-10	2-9	5-8	10-4 1/2	11-1 1/2	9-10	10-7	6x4
5	120	20	12	8	17 1/2	1-3	0-10	2-9	5-8	10-4 1/2	11-1 1/2	9-10	10-7	6x4
6	144	20	12	8	17 1/2	1-3	0-10	2-9	5-8	10-4 1/2	11-1 1/2	9-10	10-7	6x4
7	168	20	12	8	17 1/2	1-3	0-10	2-9	5-8	10-4 1/2	11-1 1/2	9-10	10-7	6x4
8	192	20	12	8	17 1/2	1-3	0-10	2-9	5-8	10-4 1/2	11-1 1/2	9-10	10-7	6x4
9	216	20	12	8	17 1/2	1-3	0-10	2-9	5-8	10-4 1/2	11-1 1/2	9-10	10-7	6x4
10	240	20	12	8	17 1/2	1-3	0-10	2-9	5-8	10-4 1/2	11-1 1/2	9-10	10-7	6x4
11	264	20	12	8	17 1/2	1-3	0-10	2-9	5-8	10-4 1/2	11-1 1/2	9-10	10-7	6x4
12	288	20	12	8	17 1/2	1-3	0-10	2-9	5-8	10-4 1/2	11-1 1/2	9-10	10-7	6x4
13	312	20	12	8	17 1/2	1-3	0-10	2-9	5-8	10-4 1/2	11-1 1/2	9-10	10-7	6x4
14	336	20	12	8	17 1/2	1-3	0-10	2-9	5-8	10-4 1/2	11-1 1/2	9-10	10-7	6x4
15	360	20	12	8	17 1/2	1-3	0-10	2-9	5-8	10-4 1/2	11-1 1/2	9-10	10-7	6x4
16	384	20	12	8	17 1/2	1-3	0-10	2-9	5-8	10-4 1/2	11-1 1/2	9-10	10-7	6x4
17	408	20	12	8	17 1/2	1-3	0-10	2-9	5-8	10-4 1/2	11-1 1/2	9-10	10-7	6x4
18	432	20	12	8	17 1/2	1-3	0-10	2-9	5-8	10-4 1/2	11-1 1/2	9-10	10-7	6x4
19	456	20	12	8	17 1/2	1-3	0-10	2-9	5-8	10-4 1/2	11-1 1/2	9-10	10-7	6x4
20	480	20	12	8	17 1/2	1-3	0-10	2-9	5-8	10-4 1/2	11-1 1/2	9-10	10-7	6x4
21	504	20	12	8	17 1/2	1-3	0-10	2-9	5-8	10-4 1/2	11-1 1/2	9-10	10-7	6x4
22	528	20	12	8	17 1/2	1-3	0-10	2-9	5-8	10-4 1/2	11-1 1/2	9-10	10-7	6x4
23	552	20	12	8	17 1/2	1-3	0-10	2-9	5-8	10-4 1/2	11-1 1/2	9-10	10-7	6x4
24	576	20	12	8	17 1/2	1-3	0-10	2-9	5-8	10-4 1/2	11-1 1/2	9-10	10-7	6x4
25	600	20	12	8	17 1/2	1-3	0-10	2-9	5-8	10-4 1/2	11-1 1/2	9-10	10-7	6x4
26	624	20	12	8	17 1/2	1-3	0-10	2-9	5-8	10-4 1/2	11-1 1/2	9-10	10-7	6x4
27	648	20	12	8	17 1/2	1-3	0-10	2-9	5-8	10-4 1/2	11-1 1/2	9-10	10-7	6x4
28	672	20	12	8	17 1/2	1-3	0-10	2-9	5-8	10-4 1/2	11-1 1/2	9-10	10-7	6x4
29	696	20	12	8	17 1/2	1-3	0-10	2-9	5-8	10-4 1/2	11-1 1/2	9-10	10-7	6x4
30	720	20	12	8	17 1/2	1-3	0-10	2-9	5-8	10-4 1/2	11-1 1/2	9-10	10-7	6x4
31	744	20	12	8	17 1/2	1-3	0-10	2-9	5-8	10-4 1/2	11-1 1/2	9-10	10-7	6x4
32	768	20	12	8	17 1/2	1-3	0-10	2-9	5-8	10-4 1/2	11-1 1/2	9-10	10-7	6x4
33	792	20	12	8	17 1/2	1-3	0-10	2-9	5-8	10-4 1/2	11-1 1/2	9-10	10-7	6x4
34	816	20	12	8	17 1/2	1-3	0-10	2-9	5-8	10-4 1/2	11-1 1/2	9-10	10-7	6x4
35	840	20	12	8	17 1/2	1-3	0-10	2-9	5-8	10-4 1/2	11-1 1/2	9-10	10-7	6x4
36	864	20	12	8	17 1/2	1-3	0-10	2-9	5-8	10-4 1/2	11-1 1/2	9-10	10-7	6x4
37	888	20	12	8	17 1/2	1-3	0-10	2-9	5-8	10-4 1/2	11-1 1/2	9-10	10-7	6x4
38	912	20	12	8	17 1/2	1-3	0-10	2-9	5-8	10-4 1/2	11-1 1/2	9-10	10-7	6x4
39	936	20	12	8	17 1/2	1-3	0-10	2-9	5-8	10-4 1/2	11-1 1/2	9-10	10-7	6x4
40	960	20	12	8	17 1/2	1-3	0-10	2-9	5-8	10-4 1/2	11-1 1/2	9-10	10-7	6x4
41	984	20	12	8	17 1/2	1-3	0-10	2-9	5-8	10-4 1/2	11-1 1/2	9-10	10-7	6x4
42	1008	20	12	8	17 1/2	1-3	0-10	2-9	5-8	10-4 1/2	11-1 1/2	9-10	10-7	6x4
43	1032	20	12	8	17 1/2	1-3	0-10	2-9	5-8	10-4 1/2	11-1 1/2	9-10	10-7	6x4
44	1056	20	12	8	17 1/2	1-3	0-10	2-9	5-8	10-4 1/2	11-1 1/2	9-10	10-7	6x4
45	1080	20	12	8	17 1/2	1-3	0-10	2-9	5-8	10-4 1/2	11-1 1/2	9-10	10-7	6x4
46	1104	20	12	8	17 1/2	1-3	0-10	2-9	5-8	10-4 1/2	11-1 1/2	9-10	10-7	6x4
47	1128	20	12	8	17 1/2	1-3	0-10	2-9	5-8	10-4 1/2	11-1 1/2	9-10	10-7	6x4
48	1152	20	12	8	17 1/2	1-3	0-10	2-9	5-8	10-4 1/2	11-1 1/2	9-10	10-7	6x4
49	1176	20	12	8	17 1/2	1-3	0-10	2-9	5-8	10-4 1/2	11-1 1/2	9-10	10-7	6x4
50	1200	20	12	8	17 1/2	1-3	0-10	2-9	5-8	10-4 1/2	11-1 1/2	9-10	10-7	6x4

BILL OF REINFORCING STEEL FOR 44'-0" CULVERT

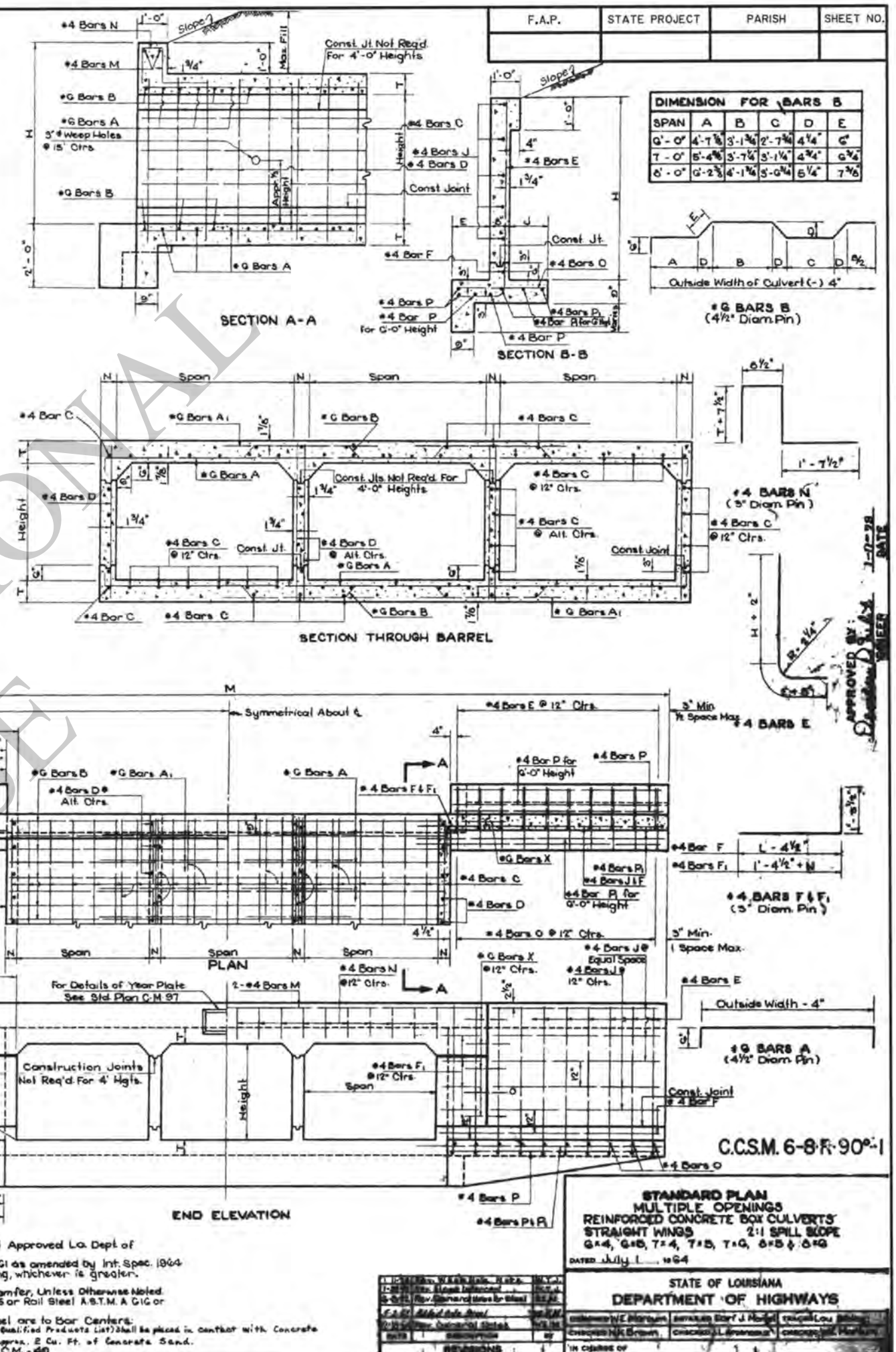
BARREL REINFORCEMENT																CURBS AND WINGS REINFORCEMENT																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																				
OPENINGS		#6 BARS A				#6 BARS A ₁				#6 BARS A ₂				#6 BARS B				#4 BARS C		#4 BARS D		#4 BARS E		#4 BARS F		#4 BARS F ₁		#4 BARS F ₂		#4 BARS F ₃		#4 BARS J		#4 BARS J ₁		#4 BARS J ₂		#4 BARS P		#4 BARS P ₁		#4 BARS P ₂		#4 BARS P ₃		#4 BARS N		#5 BARS M		#5 BARS P ₄		#6 BARS K																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																
SIZE	NO.	NO.	Length	Spac.	NO.	Length	Spac.	NO.	Length	Spac.	NO.	Length	Spac.	NO.	Length	Spac.	NO.	Length	NO.	Length	NO.	Length	NO.	Length	NO.	Length	NO.	Length	NO.	Length	NO.	Length	NO.	Length	NO.	Length	NO.	Length	NO.	Length	NO.	Length	NO.	Length	NO.	Length	NO.	Length																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																				
FEET			FT.-IN.	IN.		FT.-IN.	IN.		FT.-IN.	IN.		FT.-IN.	IN.		FT.-IN.	IN.		FT.-IN.		FT.-IN.		FT.-IN.		FT.-IN.		FT.-IN.		FT.-IN.		FT.-IN.		FT.-IN.		FT.-IN.		FT.-IN.		FT.-IN.		FT.-IN.		FT.-IN.		FT.-IN.		FT.-IN.		FT.-IN.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																				
6x4	2	74	14-2	14	32	5-2	14	20	3-0	26	2500	11-9	7	74	14-2	14	46	47-2	188	5-0																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																

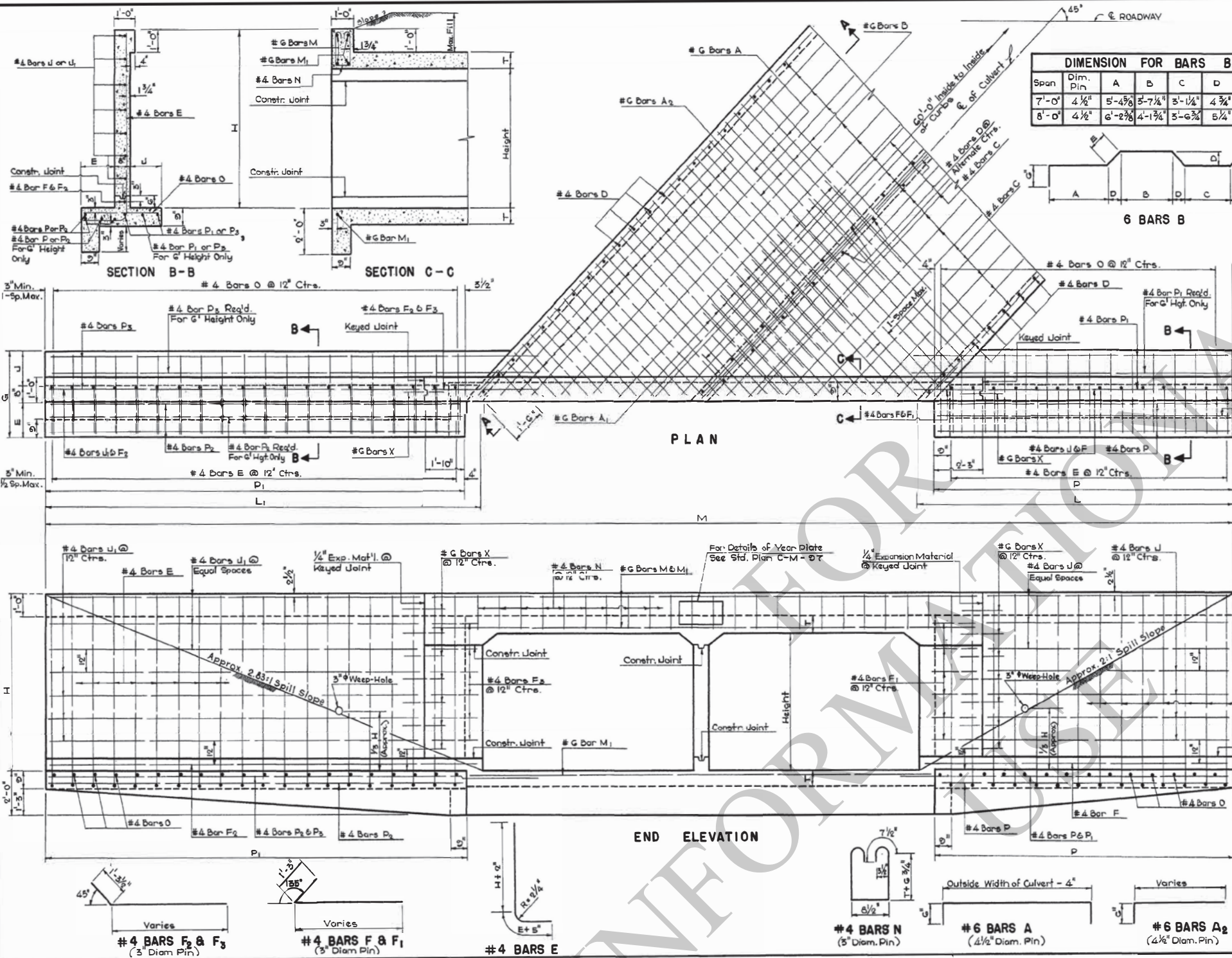
BILL OF REINFORCING STEEL FOR 44'-0" CULVERT

OPENINGS			BARREL												WINGS AND CURBS																						
SIZE	No.	*G BARS A			*G BARS A ₁			*G BARS B			*4 BARS C			*4 BARS D			*4 BARS E			*4 BARS F			*4 BARS F ₁			*4 BARS J			*4 BARS M	*4 BARS N	*4 BARS O	*4 BARS P	*4 BARS P ₁	*4 BARS X			
		No.	Length Ft.-In.	Spc. In.	No.	Length Ft.-In.	Spc. In.	No.	Length Ft.-In.	Spc. In.	No.	Length Ft.-In.	Spc. In.	No.	Length Ft.-In.	Spc. In.	No.	Length Ft.-In.	Spc. In.	No.	Length Ft.-In.	Spc. In.	No.	Length Ft.-In.	Spc. In.	No.	Length Ft.-In.	Spc. In.	No.	Length Ft.-In.	Spc. In.	No.	Length Ft.-In.	Spc. In.	No.	Length Ft.-In.	
6 x 4	2	78	14-2	14	76	5-2	14	80	14-5 1/2	14	46	47-2	138	5-0	12																						
	3	78	20-8	14	156	5-2	14	80	21-3	14	98	47-2	184	5-0	12																						
	4	78	27-2	14	234	5-2	14	80	28-0 1/2	14	90	47-2	230	5-0	12																						
	5	78	33-8	14	312	5-2	14	80	34-10	14	112	47-2	272	5-0	12																						
	6	78	42-4	14	390	5-2	14	80	43-9 1/2	14	134	47-2	322	5-0	12																						
6 x 5	2	78	14-2	14	78	5-2	14	80	14-5 1/2	14	49	47-2	138	G-0	12																						
	3	78	20-8	14	156	5-2	14	80	21-3	14	72	47-2	184	G-0	12																						
	4	78	27-2	14	234	5-2	14	80	28-0 1/2	14	95	47-2	230	G-0	12																						
	5	78	33-8	14	312	5-2	14	80	34-10	14	116	47-2	276	G-0	12																						
	6	78	42-4	14	390	5-2	14	80	43-9 1/2	14	141	47-2	322	G-0	12																						
7 x 4	2	84	16-2	13	84	5-8	13	86	16-G	13	50	47-2	138	5-1	12																						
	3	84	23-8	13	168	5-8	13	86	24-4	13	74	47-2	164	5-1	12																						
	4	84	31-2	13	252	5-8	13	86	32-2	13	98	47-2	230	5-1	12																						
	5	84	38-8	13	336	5-8	13	86	40-0	13	122	47-2	276	5-1	12																						
	6	84	46-4	13	420	5-8	13	86	50-0	13	146	47-2	322	5-1	12																						
7 x 5	2	84	16-2	13	84	5-8	13	86	16-G	13	53	47-2	138	G-1	12																						
	3	84	23-8	13	168	5-8	13	86	24-4	13	78	47-2	164	G-1	12																						
	4	84	31-2	13	252	5-8	13	86	32-2	13	105	47-2	230	G-1	12																						
	5	84	38-8	13	336	5-8	13	86	40-0	13	126	47-2	276	G-1	12																						
	6	84	46-4	13	420	5-8	13	86	50-0	13	153	47-2	322	G-1	12																						
7 x 6	2	84	16-2	13	84	5-8	13	86	16-G	13	56	47-2	166	7-1	10																						
	3	84	23-8	13	168	5-8	13	86	24-4	13	82	47-2	224	7-1	10																						
	4	84	31-2	13	252	5-8	13	86	32-2	13	108	47-2	260	7-1	10																						
	5	84	38-8	13	336	5-8	13	86	40-0	13	134	47-2	336	7-1	10																						
	6	84	46-4	13	420	5-8	13	86	50-0	13	160	47-2	392	7-1	10																						
8 x 5	2	92	18-5	12	92	G-2	12	92	18-9 1/4	12	57	47-2	138	G-2	12																						
	3	92	27-0	12	104	G-2	12	92	27-8 1/2	12	84	47-2	164	G-2	12																						
	4	92	35-7	12	276	G-2	12	92	36-7 1/4	12	111	47-2	230	G-2	12																						
	5	92	44-4	12	368	G-2	12	92	47-9	12	138	47-2	276	G-2	12																						
	6	92	54-11	12	460	G-2	12	92	56-8 1/4	12	165	47-2	322	G-2	12																						
8 x 6	2	92	18-5	12	92	G-2	12	92	18-9 1/4	12	60	47-2	138	7-2	12																						
	3	92	27-0	12	164	G-2	12	92	27-8 1/2	12	88	47-2	164	7-2	12																						
	4	92	35-7	12	276	G-2	12	92	36-7 1/4	12	116	47-2	230	7-2	12																						
	5	92	44-4	12	368	G-2	12	92	47-9	12	144	47-2	276	7-2	12																						
	6	92	54-11	12	460	G-2	12	92	56-8 1/4	12	172	47-2	322	7-2	12																						

① Includes One 1'-6" Lap Splice. ② Includes One 2'-2" Lap Splice. ③ #6 Bars 'X' to be $\frac{3}{4}$ " ϕ Smooth & Greased for 1'-0" of Length.

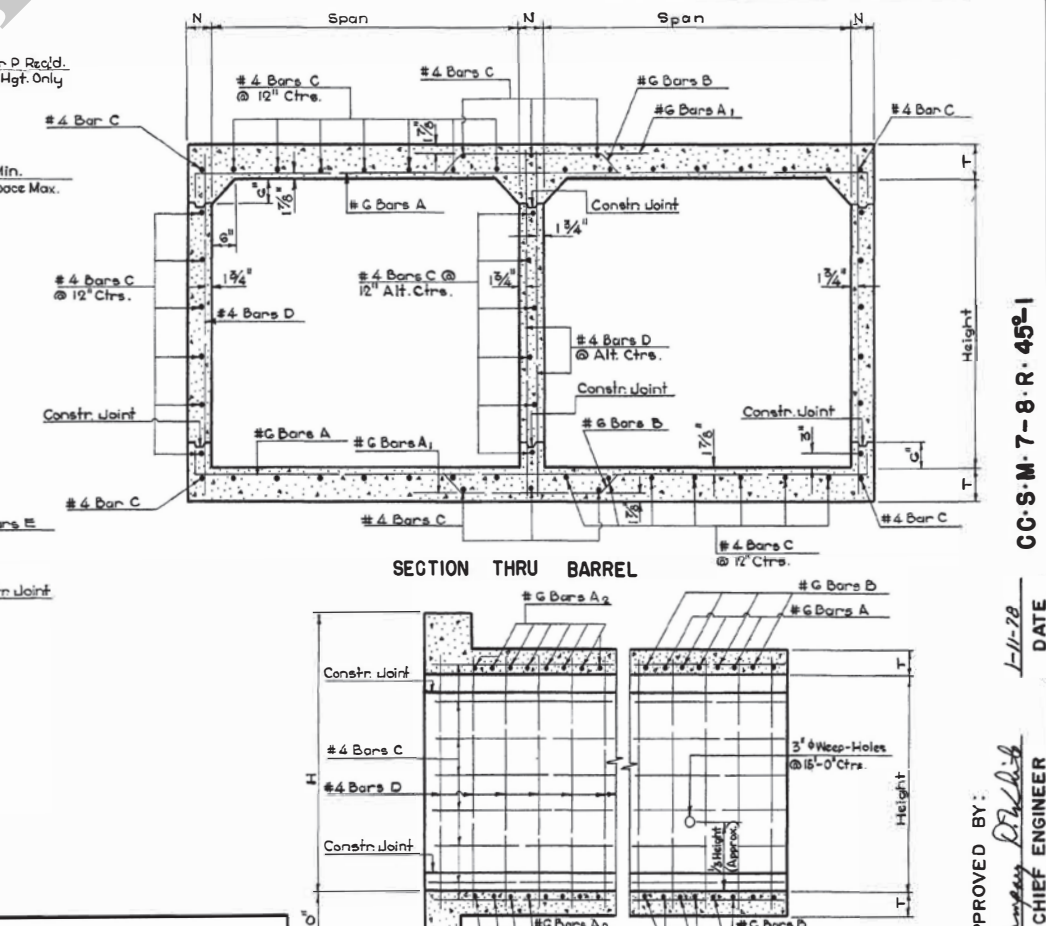
DIMENSIONS														QUANTITIES				OPENINGS	
OPENINGS		MAX. FILL		BARREL										WINGS AND CURBS		PER LIN. FOOT OF BARREL			
SIZE	No.	AREA	SLAB	WALL	T	N	E	J	G	H	L	P	M	STEEL	CONCRETE	STEEL	CONCRETE	No.	SIZE
FEET		Sq. Ft.	Feet	Feet	In.	In.	Feet-In.	Feet-In.	Feet-In.	Feet-In.	Feet-In.	Feet-In.	Feet-In.	Pounds	Cu. Yds.	Pounds	Cu. Yds.		Feet
6' x 4'	2	46	16											33-2	127.76	0.9074	GG74	53.64	2
	3	72												39-8	125.32	1.3117	9760	73.20	3
	4	96	20	12	8	G	1-3	10	2-9	5-8	10-4	9-10		46-2	258.65	1.7161	12,653	92.77	4
	5	120												52-8	324.45	2.1204	15,940	112.33	5
	6	144												59-2	401.17	2.5247	19,551	131.89	6
6' x 5'	2	60	15											37-2	131.76	0.9630	7072	60.02	2
	3	90												43-8	198.66	1.3858	10,220	80.43	3
	4	120	20	7	8	G	1-5	1-2	3-3	G-8	12-4	11-10		51-2	265.56	1.8067	13,376	100.64	4
	5	150												56-8	332.46	2.2315	16,524	121.26	5
	6	180												63-2	410.52	2.6544	20,196	141.67	6
7' x 4'	2	56	12											35-2	149.68	1.0540	7713	60.69	2
	3	84												42-8	227.54	1.5309	11,372	83.72	3
	4	112	16	12	8 1/2	G	1-3	10	2-9	5-8 1/2	10-4	9-10		50-2	305.20	2.0077	15,024	106.75	4
	5	140												57-8	352.56	2.4646	16,607	129.76	5
	6	168												65-2	472.54	2.9614	22,692	152.60	6
7' x 5'	2	70	12											39-2	153.69	1.1096	8111	67.07	2
	3	105												46-8	232.88	1.6049	11,832	90.95	3
	4	140	16	7	8 1/2	G	1-5	1-2	3-3	G-2 1/2	12-4	11-10		54-2	311.88	2.1003	15,546	114.63	4
	5	175												61-8	390.68	2.5957	19,272	136.71	5
	6	210												69-2	481.69	3.0910	23,539	162.59	6
7' x 6'	2	84	11											43-2	160.74	1.1651	8,756	74.07	2
	3	126												50-2	242.02	1.6790	12,566	96.80	3
	4	168	16	5	8 1/2	G	1-7	1-6	3-9	7-8 1/2	14-4	13-10		58-2	323.29	2.1929	16,410	123.53	4
	5	210												65-8	404.57	2.7068	20,245	146.27	5
	6	252												73-2	487.66	3.2207	24,622	173.00	6
8' x 5'	2	80	10											41-5	180.67	1.3287	9373	77.48	2
	3	120												50-0	273.96	1.9228	13771	106.05	3
	4	160	14	9	9	7	1-5	1-2	3-3	G-9	12-5	11-10		58-7	367.30	2.5170	18,166	134.61	4
	5	200												67-2	473.63	3.1111	23,162	163.17	5
	6	240												75-9	566.04	3.7053	27,559	191.73	6
8' x 6'	2	96	9											45-5	184.65	1.3935	9,677	84.92	2
	3	144												54-0	279.33	2.0092	14,366	114.47	3
	4	192	13	5	9	7	1-7	1-6	3-9	7-9	14-5	13-10		62-7	373.96	2.6250	18,796	144.03	4
	5	240												71-2	481.64	3.2407	23,652	173.59	5
	6	288												79-9	576.29	3.6565	26,312	203.14	6





DIMENSION FOR BARS B					
Span	Dim. Pin	A	B	C	D
7'-0"	4 1/2"	5'-4 5/8"	5'-7 1/4"	5'-1 1/2"	4 3/4"
8'-0"	4 1/2"	6'-2 3/8"	4'-1 1/4"	3'-6 3/8"	5 1/4"

DIMENSIONS															QUANTITIES				
OPENINGS			MAX. FILL	BARREL		WINGS AND CURBS										PER LIN. FT. OF		60'-0" CULVERT	
SIZE	N ^o	AREA	SLABS	WALLS	T	N	E	W	G	H	L	L ₁	P	R	M	STEEL	CONCRETE	STEEL	CONCRETE
Feet		Sq. Ft.	Feet		In.	In.	Ft.-In.	Ft.-In.	Ft.-In.	Ft.-In.	Ft.-In.	Ft.-In.	Ft.-In.	Ft.-In.	Ft.-In.	Pounds	Cu. Yds.	Pounds	Cu. Yds.
7x5	2	70	1G	7	6½	C	1-5	1-2	3-3	6-6½	12-8½	17-6½	12-0	16-10	50-9¼	153.88	1.1096	111.24	82.62
	3	105													61-4½	232.80	1.6040	166.37	122.30
	4	140													71-1½	311.88	2.1035	222.95	154.27
	5	175													82-6¾	390.88	2.8957	282.23	187.64
	6	210													93-2½	481.80	3.6910	347.24	220.31
7x6	2	84	1G	5	8½	C	1-7	1-6	3-2	7-6½	14-8½	20-5½	14-0	19-2	55-8¼	160.74	1.1681	120.00	26.56
	3	126													66-3¾	242.02	1.6760	176.10	132.28
	4	168													76-10¼	323.20	2.1920	234.16	166.22
	5	210													87-5¼	404.57	2.7068	296.87	200.06
	6	252													98-1¼	497.66	3.2207	361.35	235.89
8x5	2	80	1D	9	9	7	1-5	1-2	3-3	6-2	12-2¾	17-7¾	12-0	16-10	53-11¼	160.67	1.3287	122.55	103.56
	3	120													66-0¼	273.06	1.9228	195.62	142.28
	4	160													76-2¾	367.30	2.5170	262.03	182.00
	5	200													86-4¾	473.65	3.1111	337.17	221.07
	6	240													96-5¾	566.94	3.7053	412.77	260.14
8x6	2	96	5	2	7	1-7	1-6	3-2	7-2	14-2¾	20-5¾	14-0	19-8	56-9¼	164.68	1.3955	135.76	113.33	
	3	144												70-10¼	279.33	2.0092	201.14	153.75	
	4	192												83-0¾	373.06	2.6250	270.93	194.18	
	5	240												95-2¼	461.64	3.2407	346.12	234.61	
	6	288												107-3¾	576.20	3.8565	422.07	275.04	



BILL OF REINFORCING STEEL FOR 60'-0" CULVERT																								
BARREL REINFORCEMENT										CURBS AND WINGS REINFORCEMENT														
OPENING	#4 BARS A	#4 BARS A ₁	#4 BARS A ₂	#4 BARS B	#4 BARS C	#4 BARS D	#4 BARS E	#4 BARS F	#4 BARS F ₁	#4 BARS F ₂	#4 BARS F ₃	#4 BARS J	#4 BARS J ₁	#4 BARS O	#4 BARS P	#4 BARS P ₁	#4 BARS P ₂	#4 BARS P ₃	#4 BARS N	#4 BARS M	#4 BARS M ₁	#4 BARS X	#4 BARS X ₁	#4 BARS X ₂
SIZE	Length	Length	Length	Length	Length	Length	Length	Length	Length	Length	Length	Length	Length	Length	Length	Length	Length	Length	Length	Length	Length	Length	Length	Length
Feet	Feet	Feet	Feet	Feet	Feet	Feet	Feet	Feet	Feet	Feet	Feet	Feet	Feet	Feet	Feet	Feet	Feet	Feet	Feet	Feet	Feet	Feet	Feet	Feet
7x5	2 86	16-2	13 122	5-8	104	2-1	6.4800	15-7	6 1/2	86	16-2	13 53	104	2-1	6.4800	15-7	6 1/2	86	16-2	13 53	104	2-1	6.4800	15-7
	3 74	23-8	13 265	5-8	104	2-1	6.4800	15-7	6 1/2	86	16-2	13 53	104	2-1	6.4800	15-7	6 1/2	86	16-2	13 53	104	2-1	6.4800	15-7
	4 60	31-2	13 448	5-8	104	2-1	6.4800	15-7	6 1/2	86	16-2	13 53	104	2-1	6.4800	15-7	6 1/2	86	16-2	13 53	104	2-1	6.4800	15-7
	5 46	38-8	13 652	5-8	104	2-1	6.4800	15-7	6 1/2	86	16-2	13 53	104	2-1	6.4800	15-7	6 1/2	86	16-2	13 53	104	2-1	6.4800	15-7
	6 32	45-4	13 892	5-8	104	2-1	6.4800	15-7	6 1/2	86	16-2	13 53	104	2-1	6.4800	15-7	6 1/2	86	16-2	13 53	104	2-1	6.4800	15-7
7x6	2 86	16-2	13 122	5-8	104	2-1	6.4800	15-7	6 1/2	86	16-2	13 53	104	2-1	6.4800	15-7	6 1/2	86	16-2	13 53	104	2-1	6.4800	15-7
	3 74	23-8	13 265	5-8	104	2-1	6.4800	15-7	6 1/2	86	16-2	13 53	104	2-1	6.4800	15-7	6 1/2	86	16-2	13 53	104	2-1	6.4800	15-7
	4 60	31-2	13 448	5-8	104	2-1	6.4800	15-7	6 1/2	86	16-2	13 53	104	2-1	6.4800	15-7	6 1/2	86	16-2	13 53	104	2-1	6.4800	15-7
	5 46	38-8	13 652	5-8	104	2-1	6.4800	15-7	6 1/2	86	16-2	13 53	104	2-1	6.4800	15-7	6 1/2	86	16-2	13 53	104	2-1	6.4800	15-7
	6 32	45-4	13 892	5-8	104	2-1	6.4800	15-7	6 1/2	86	16-2	13 53	104	2-1	6.4800	15-7	6 1/2	86	16-2	13 53	104	2-1	6.4800	15-7
8x5	2 90	18-5	12 134	6-2	118	2-2	6.0000	17-8	6	90	18-5	12 57	118	2-2	6.0000	17-8	6	90	18-5	12 57	118	2-2	6.0000	17-8
	3 76	27-0	12 300	6-2	118	2-2	6.0000	17-8	6	90	18-5	12 57	118	2-2	6.0000	17-8	6	90	18-5	12 57	118	2-2	6.0000	17-8
	4 56	35-7	12 504	6-2	118	2-2	6.0000	17-8	6	90	18-5	12 57	118	2-2	6.0000	17-8	6	90	18-5	12 57	118	2-2	6.0000	17-8
	5 40	44-0	12 744	6-2	118	2-2	6.0000	17-8	6	90	18-5	12 57	118	2-2	6.0000	17-8	6	90	18-5	12 57	118	2-2	6.0000	17-8
	6 20	54-11	12 1020	6-2	118	2-2	6.0000	17-8	6	90	18-5	12 57	118	2-2	6.0000	17-8	6	90	18-5	12 57	118	2-2	6.0000	17-8
8x6	2 90	18-5	12 134	6-2	118	2-2	6.0000	17-8	6	90	18-5	12 57	118	2-2	6.0000	17-8	6	90	18-5	12 57	118	2-2	6.0000	17-8
	3 76	27-0	12 300	6-2	118	2-2	6.0000	17-8	6	90	18-5	12 57	118	2-2	6.0000	17-8	6	90	18-5	12 57	118	2-2	6.0000	17-8
	4 56	35-7	12 504	6-2	118	2-2	6.0000	17-8	6	90	18-5	12 57	118	2-2	6.0000	17-8	6	90	18-5	12 57	118	2-2	6.0000	17-8
	5 40	44-0	12 744	6-2	118	2-2	6.0000	17-8	6	90	18-5	12 57	118	2-2	6.0000	17-8	6	90	18-5	12 57	118	2-2	6.0000	17-8
	6 20	54-11	12 1020	6-2	118	2-2	6.0000	17-8	6	90	18-5	12 57	118	2-2	6.0000	17-8	6	90	18-5	12 57	118	2-2	6.0000	17-8

GENERAL NOTES:

CONSTRUCTION SPECIFICATIONS: Latest Approved La. Dept. of Hwy. Standard Specifications.

DESIGN SPECIFICATIONS: A.A.S.H.O. 1961 as amended by INT. SPECIFICATIONS 1964.

LIVE LOAD: HS 20-44 or Military; Whichever is Greater.

All Concrete to be Class "A".

All Exposed Corners to have 3/4" Chamfer, Unless Otherwise Noted.

Reinforcement Bars shall be Billet-Steel A.S.T.M. A615 or Rail-Steel A.S.T.M. A616 or A617.

Dimensions Relating to Reinforcing Steel are to Bar Centers.

A 1'-6" Square of Plastic Filter Cloth (See Qualified Products List) shall be placed in contact with concrete behind each Weep Hole, in addition to approx. 2 Cu. Ft. of Concrete Sand.

For Detail of Joints See Std. Plan C.M.-49.

STANDARD PLAN

MULTIPLE OPENINGS

REINFORCED CONCRETE BOX CULVERT

STRAIGHT SLOPE

2:1 SPILL SLOPE NORMAL TO CHANNEL

7'x5' 7'x6' 8'x5' 8'x6'

DATED: JANUARY 20, 1966

STATE OF LOUISIANA
DEPARTMENT OF HIGHWAYS

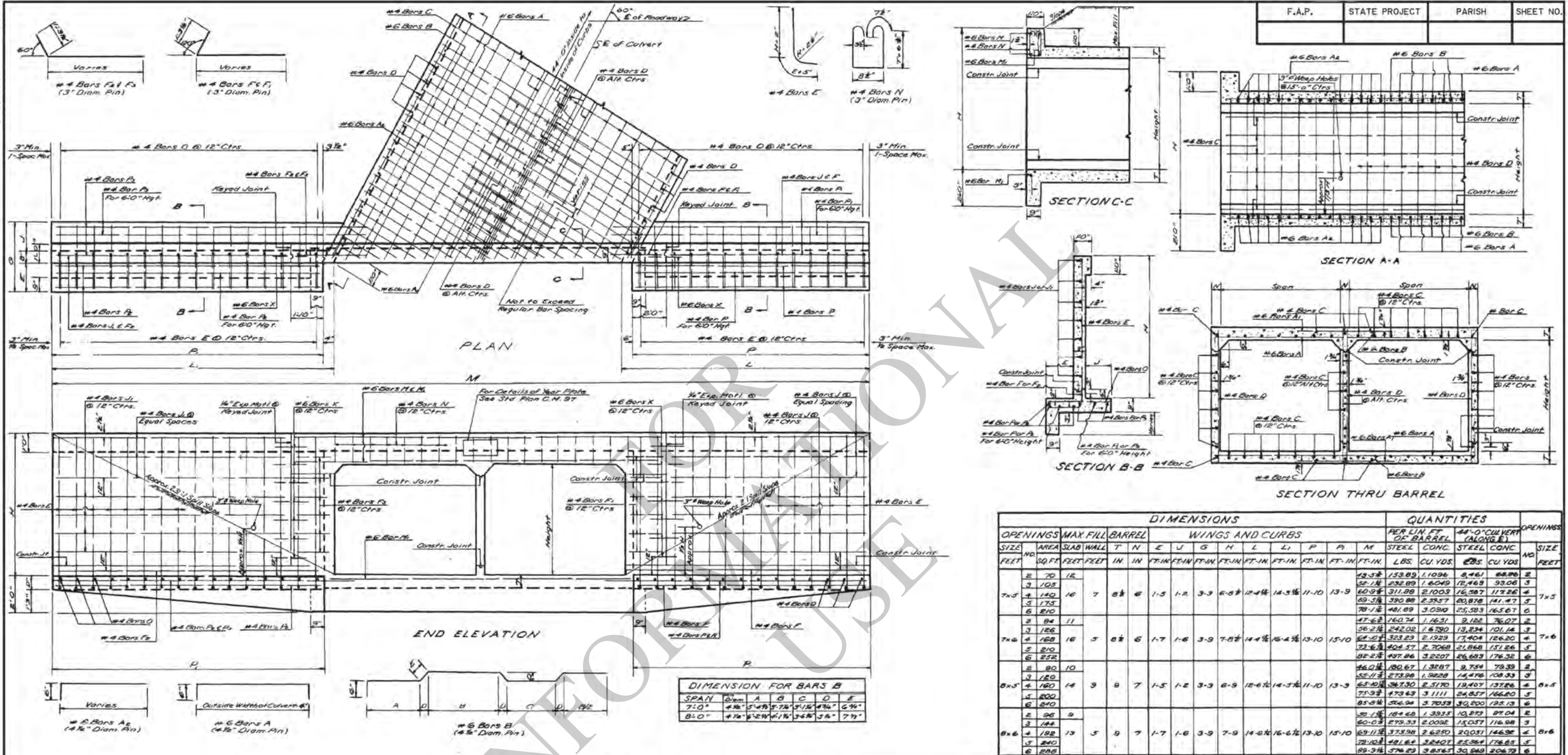
DESIGNED: W.E.M. CHECKED: N.K.B. IN CHARGE OF: W.E.M.

DATE: 5-2-61

REVISIONS

APPROVED BY: *[Signature]* CHIEF ENGINEER

DATE: 1-11-78



BILL OF REINFORCING STEEL FOR 44'-0" CULVERT																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																											
BARREL REINFORCEMENT																				WINGS AND CURBS REINFORCEMENT																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																							
OPENINGS	#6 BARS A	#6 BARS A ₁	#6 BARS A ₂	#6 BARS B	#6 BARS C	#6 BARS D	#6 BARS E	#6 BARS F	#6 BARS G	#6 BARS H	#6 BARS I	#6 BARS J	#6 BARS K	#6 BARS L	#6 BARS M	#6 BARS N	#6 BARS O	#6 BARS P	#6 BARS Q	#6 BARS R	#6 BARS S	#6 BARS T	#6 BARS U	#6 BARS V	#6 BARS W	#6 BARS X	#6 BARS Y	#6 BARS Z	#6 BARS AA	#6 BARS AB	#6 BARS AC	#6 BARS AD	#6 BARS AE	#6 BARS AF	#6 BARS AG	#6 BARS AH	#6 BARS AI																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																						
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GENERAL NOTES:

CONSTRUCTION SPECIFICATIONS: LATEST APPROVED LA DEPT OF HIGHWAY STANDARD SPECIFICATIONS.

DESIGN SPECIFICATIONS: A.S.H.O. 1961 AS AMENDED BY INT. SPEC. 1964.

LIVE LOAD: H.S. 20-44 OR MILITARY, WHICHEVER IS GREATER.

ALL CONCRETE TO BE CLASS "A".

ALL EXPOSED CORNERS TO HAVE 3/4" CHAMFER UNLESS OTHERWISE NOTED.

REINFORCEMENT SHALL BE BILLET-STEEL A.S.T.M. A 615 OR RAIL-STEEL A.S.T.M. A 615.

DIMENSIONS RELATING TO REINFORCING STEEL ARE TO BAR CENTERS.

A 1'-0" Square of Plastic Filter Cloth (See Qualified Products List) shall be placed in contact with the concrete behind each Weep Hole, in addition to approx. 2 Cu. Ft. of Concrete Sand.

For Detail of Joints, See Std. Plan C.M.-49.

APPROVED BY: *[Signature]* 5-78

CC-SM-7-8-R-60°-1

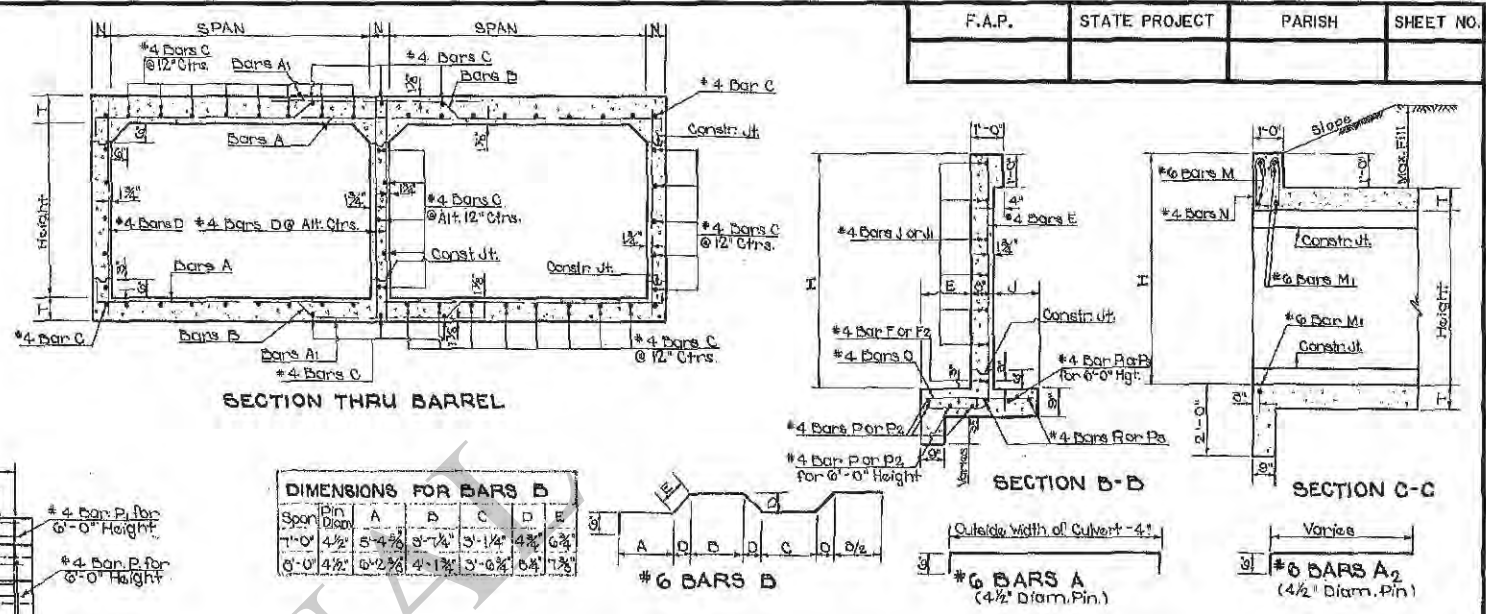
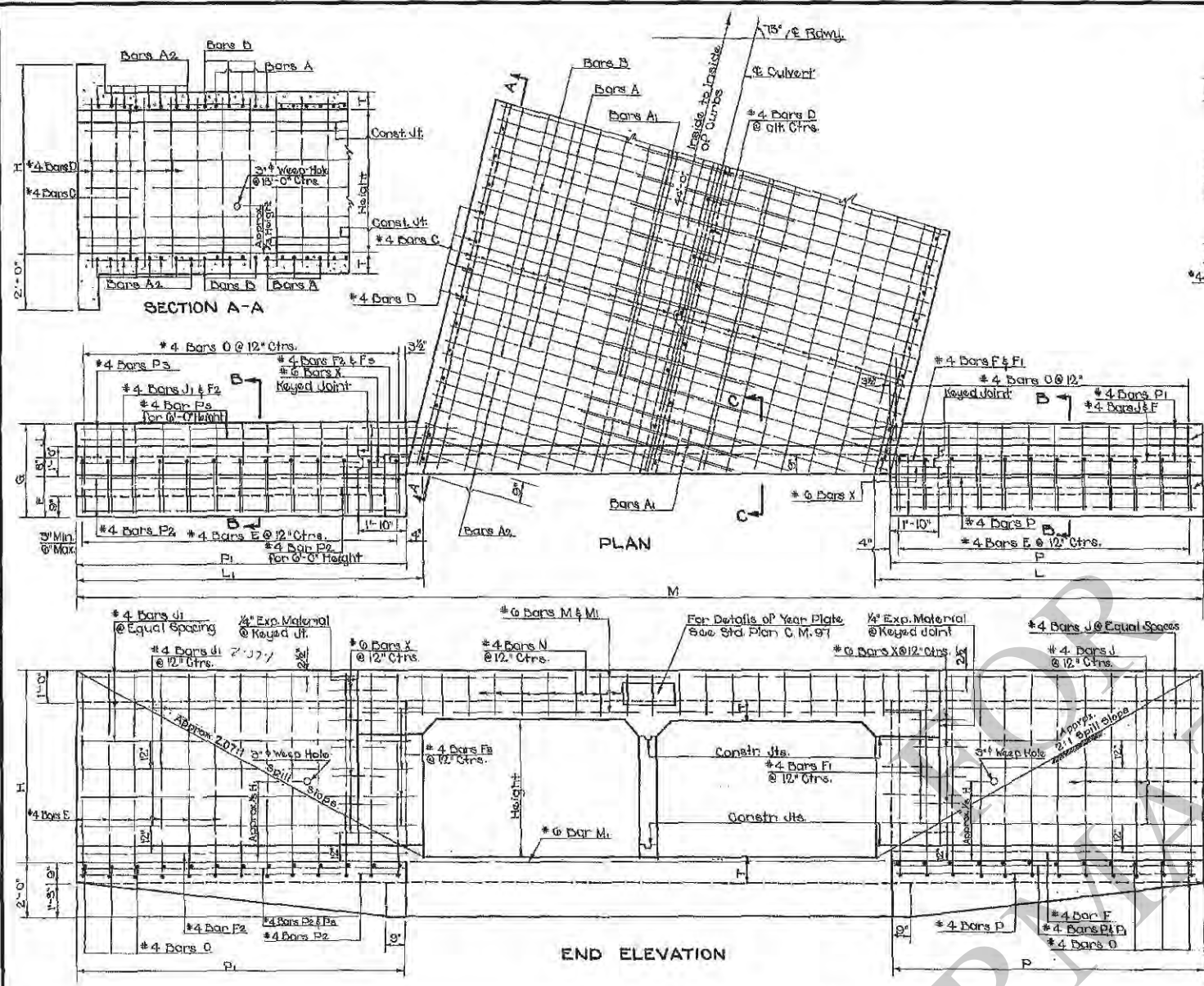
CHIEF ENGINEER DATE

STANDARD PLAN
MULTIPLE OPENINGS
REINFORCED CONCRETE BOX CULVERT
STRAIGHT WINGS
60° CROSSING
7'x5' 7'x6' 8'x5' 8'x6'

DATED May 26, 1965

STATE OF LOUISIANA
DEPARTMENT OF HIGHWAYS

DESIGNED	Marcum	DETAILED	Marcum	TRACED	Dunnin
CHECKED	Brown	CHECKED	Brown	CHECKED	A.R. Berg
DATE	DESCRIPTION	BY	DATE	DESCRIPTION	BY
	REVISIONS			REVISIONS	



DIMENSIONS FOR BARS B

Span	Pin	A	B	C	D	E
7'-0"	4 1/2"	5'-4 1/2"	3'-7 1/2"	3'-1 1/2"	4'	6 1/2"
0'-0"	4 1/2"	0'-2 1/2"	4'-1 1/2"	3'-6 1/2"	6 1/2"	7 1/2"

DIMENSIONS															QUANTITIES				OPENINGS	
OPENINGS		MAX. FILL		BARREL		WINGS AND CURBS									PER LIN. FT. OF BARREL		44'-6" CULVERT (ALONG C)		OPENINGS	
SIZE	NO.	AREA	SLAB WALL	T	N	E	J	G	H	L	L ₁	P	P ₁	M	STEEL	CONC.	STEEL	CONC.	NO.	FEET
FEET		SQ. FT.	FEET	IN.	IN.	FT.-IN.	FT.-IN.	FT.-IN.	FT.-IN.	FT.-IN.	FT.-IN.	FT.-IN.	FT.-IN.	FT.-IN.	LBS.	CY. YDS.	LBS.	CY. YDS.		
7x5	2	70	12											40-5 9/16	153.09	1.1086	0.350	67.66	2	
	3	105												46-2 3/4	232.89	1.6049	12.264	91.01	3	
	4	140	16	7	8 1/2	6	1-5	1-2	3-3	6-8 1/2	12-4 1/2	13-1 1/2	11-10	55-11 1/2	511.66	2.1003	16.142	115.56	4	7x5
	5	175												63-9 1/16	590.66	2.5587	20.196	139.51	5	
	6	210												71-8 1/4	481.89	3.0910	24.774	163.46	6	
7x6	2	84	11											44-5 9/16	160.74	1.1651	9.009	74.72	2	
	3	126												52-2 3/4	242.02	1.6790	13.014	99.53	3	
	4	168	16	5	8 1/2	6	1-7	1-6	3-8	7-8 1/2	14-4 1/2	15-1 1/2	13-10	59-11 1/2	323.29	2.1929	16.949	124.34	4	7x6
	5	210												67-9 1/16	404.87	2.7065	21.175	149.14	5	
	6	252												75-0 1/2	497.66	3.2207	25.683	173.98	6	
8x5	2	80	10											42-9 1/2	160.67	1.3267	9.884	76.10	2	
	3	120												51-0 1/2	275.90	1.9228	14.246	106.75	3	
	4	160	14	9	9	7	1-5	1-2	3-3	6-9	12-5 1/2	13-2 1/2	11-10	60-0 1/2	367.30	2.5170	19.954	135.39	4	8x5
	5	200												69-5 1/16	473.63	3.1111	24.079	164.04	5	
	6	240												76-4 1/2	566.84	3.7053	29.028	192.89	6	
8x6	2	96	9											40-9 1/2	164.66	1.3935	10.194	85.60	2	
	3	144												55-0 1/2	279.55	2.0092	14.820	115.84	3	
	4	192	13	5	9	7	1-7	1-6	3-9	7-9	14-5 1/2	15-2 1/2	13-10	64-0 1/2	373.93	2.6250	19.567	144.68	4	8x6
	5	240												73-5 1/16	481.64	3.2407	24.775	174.53	5	
	6	288												82-4 1/2	576.29	3.6565	29.767	204.17	6	

OPENINGS		BARREL REINFORCEMENT										WINGS AND CURBS REINFORCEMENT									
SIZE	NO.	SIZE	NO.	SIZE	NO.	SIZE	NO.	SIZE	NO.	SIZE	NO.	SIZE	NO.	SIZE	NO.	SIZE	NO.	SIZE	NO.	SIZE	NO.
7x5	2	7x5	3	7x5	4	7x5	5	7x5	6	7x5	7	7x5	8	7x5	9	7x5	10	7x5	11	7x5	12
7x6	2	7x6	3	7x6	4	7x6	5	7x6	6	7x6	7	7x6	8	7x6	9	7x6	10	7x6	11	7x6	12
8x5	2	8x5	3	8x5	4	8x5	5	8x5	6	8x5	7	8x5	8	8x5	9	8x5	10	8x5	11	8x5	12
8x6	2	8x6	3	8x6	4	8x6	5	8x6	6	8x6	7	8x6	8	8x6	9	8x6	10	8x6	11	8x6	12

GENERAL NOTES:
Construction Specifications: Latest Approved La. Dept. of Highways Standard Specifications.
Design Specifications: A.A.S.H.O. 1961 as Amended by Int. Spec. 1964.
Live Load: HS 20-44 on Military; Whichever is Greater.
All Concrete to be Class 'A'.
All Exposed Corners to have 3/4" Chamfer, Unless Otherwise Noted.
Reinforcement shall be Billed - Steel A.S.T.M. A615 or Bar Steel A.S.T.M. A616 in A.S.T.M. A617.
Dimensions Relating to Reinforcing Steel are to Bar Centers.
A 1'-6" Square of Plastic Filter Cloth (See Qualified Products List) shall be placed in contact with concrete behind each Weep Hole; in addition to approx. 3 Cu. Ft. of Concrete Sand. For Detail of Joints, See Std. Plan C.M.-83.

**STANDARD PLAN
MULTIPLE OPENINGS
REINFORCED CONCRETE BOX CULVERTS
STRAIGHT WINGS 75° CROSSING
7'x5' 7'x6' 8'x5' 8'x6'**

DATED Nov. 24, 1964

STATE OF LOUISIANA
DEPARTMENT OF HIGHWAYS

DESIGNED BY: M. J. McLaughlin
CHECKED BY: N. K. Brown
IN CHARGE OF:

DETAILED BY: N. Knapp
CHECKED BY: W. E. Giles
IN CHARGE OF:

TRACED BY: J. L. Read
CHECKED BY: W. E. Marcum
IN CHARGE OF:

APPROVED BY: *[Signature]*
CHIEF ENGINEER

DATE: 1-11-78

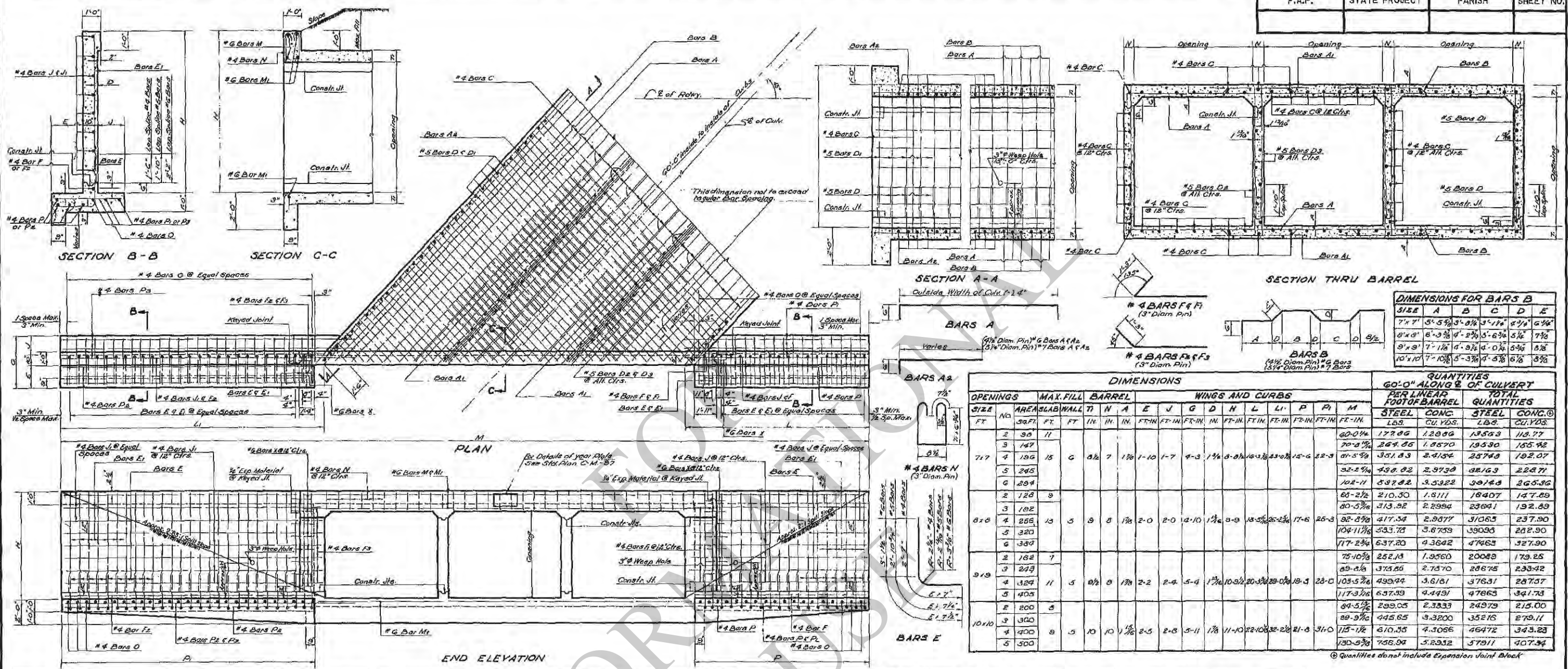
REVISIONS

NO.	DESCRIPTION	BY
1-11-78	Rev. Weep Hole Detail	W.T.J.
5-30-78	Revised Spill Slope	W.T.J.
8-6-78	Rev. Gen. Notes for Steel	W.T.J.
5-2-81	Added Auto. Steel	W.T.J.

CO-S-M-7-8-R-75-1

Varies
#4 BARS F & F1
(3" Dia. Pin)

Varies
#4 BARS F2 & F3
(3" Dia. Pin)



BILL OF REINFORCING STEEL FOR 60'-0" CULVERT																			
BARREL REINFORCEMENT										WINGS AND CURBS REINFORCEMENT									
OPENING	BAR A	BAR B	BAR C	BAR D	BAR E	BAR F	BAR G	BAR H	BAR I	BAR J	BAR K	BAR L	BAR M	BAR N	BAR O	BAR P	BAR Q	BAR R	BAR S
SIZE	NO.	SIZE	NO.	SIZE	NO.	SIZE	NO.	SIZE	NO.	SIZE	NO.	SIZE	NO.	SIZE	NO.	SIZE	NO.	SIZE	NO.
7x7	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
8x8	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
9x9	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
10x10	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1

GENERAL NOTES:
CONSTRUCTION SPECIFICATIONS: Latest Approved L.A. Dept. of Highways Std. Specs.
DESIGN SPECIFICATIONS: A.A.S.H.O. 1961 as amended by
LIVE LOAD: HS 20-44, or Military Loading, whichever is Greater.
All concrete to be Class 75.
All exposed corners to have 4" chamfer, unless otherwise noted.
Reinforcement shall be Bar-Close.
For detail of joints, see Std. Plan 6-10-48.
Dimensions relating to reinforcing steel are to Bar-Close.
A 1'-6" square of Plastic Filter Cloth (See Qualified Products List) shall be placed in contact with concrete behind each Weep Hole, in addition to approx. 2 Cu. Ft. of Concrete Sand.

CC-S-M-7-10-S-45°-1

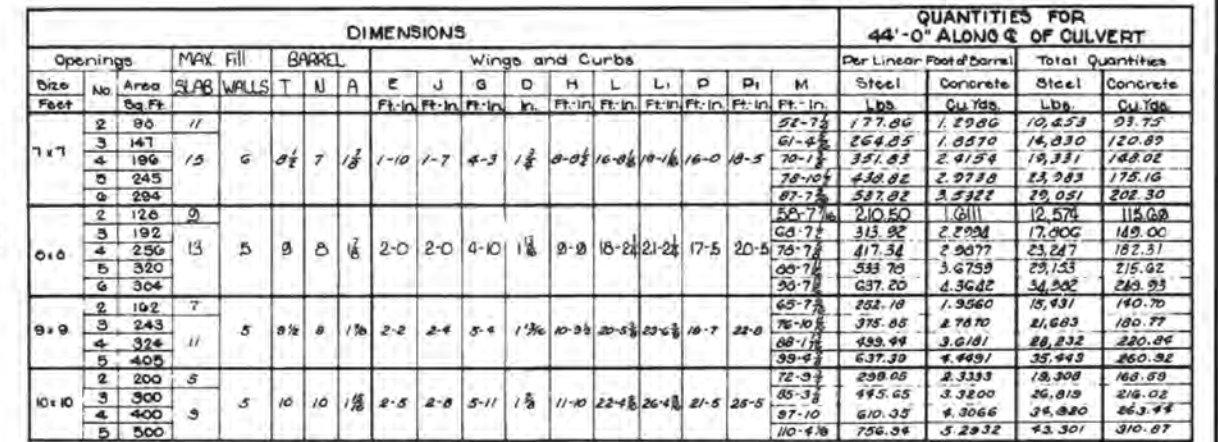
STANDARD PLAN
MULTIPLE OPENINGS
REINFORCED CONCRETE BOX CULVERTS
STRAIGHT WINGS 45° CROSSING
2:1 SPILL SLOPE NORMAL TO CHANNEL
DATED: 11-1-78

STATE OF LOUISIANA
DEPARTMENT OF HIGHWAYS

DESIGNED BY: [Signature] CHECKED BY: [Signature]
DATE: 11-1-78

APPROVED BY:
[Signature]
CHIEF ENGINEER

11-1-78
DATE

[illegible]

- ① Includes 1-1'-6" Lap Splice.
- ② Includes 1-2'-2" Lap Splice.
- ③ Does not include Lap Splice.
- ④ When Bar Length Exceeds 60'-0" Add 1-2'-2" Lap Splice
- ⑤ Includes one 2'-7" Lap Splice

① Does not include Lap Splice when Bar Length Exceeds 40'-0", Add 2'-7" Lap Splice

General Notes Cont'd
For Detail of Joints, See Std. Plan
C.M. - 4B.

(A) *G Bars X to be $\frac{3}{4}$ "^Ø Smooth and Greased for 1' 0" of Length

APPROVED BY: Dempsey D. White 1-5-78
CHIEF ENGINEER DATE

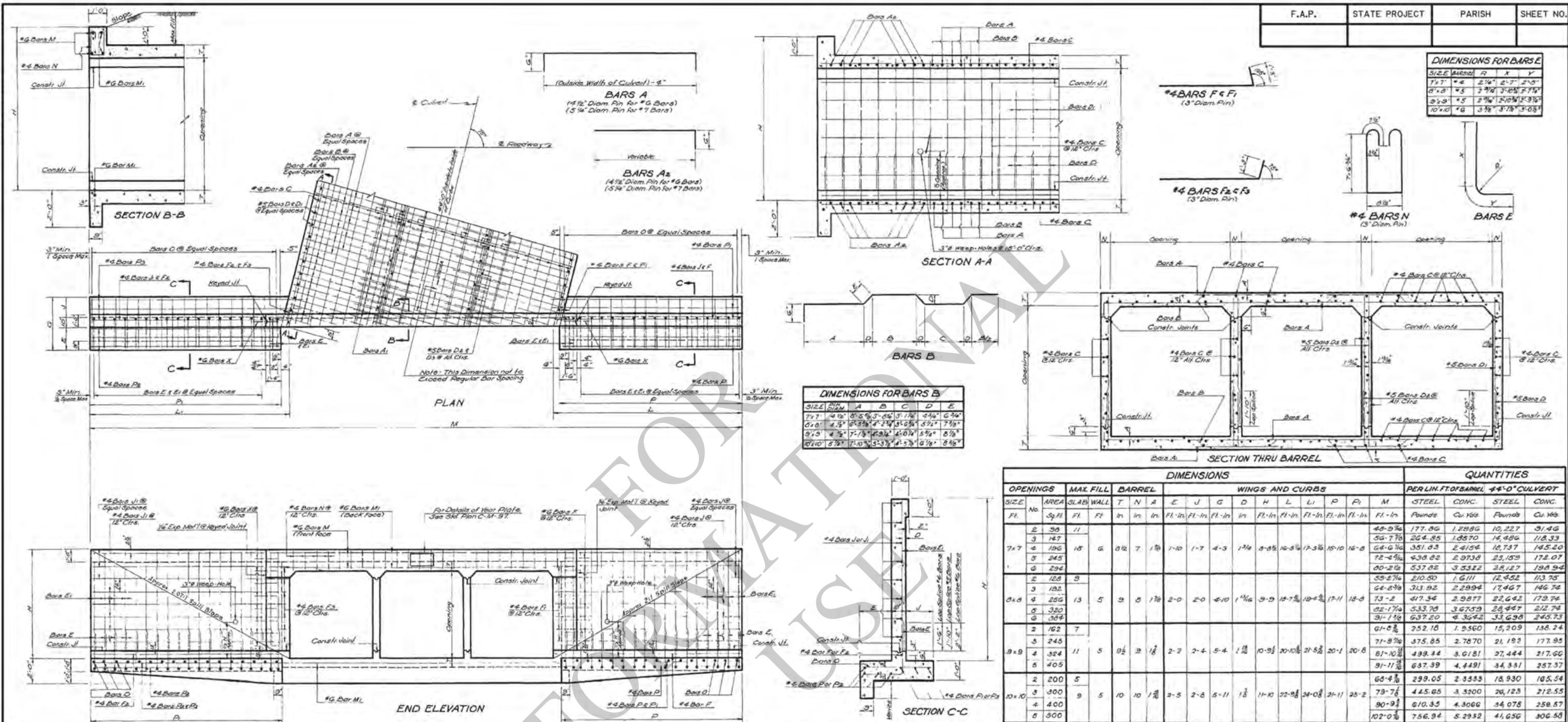
For 1' 0" of Length		2'-5 3/4"	Rev 5/26/2011 Notes	W
1-5 7/8"	Rev. Weap Hole Note	9 2-48	Added 3/54 2011/11/10	W
1-5 7/8"	Rev Steel Gun Quid	10 1-34	DICTIONED DIMS TO MATCH	W
2-20 1/2"	Rev Slope Intercept	6 1-45	Added 3-G no d's	W
6-8 1/2"	Rev General Notes for Steel	5 29 65	7 x 7 Added	W
5-8 1/2"	Added Acly Steel			
		DATE	DESCRIPTION	
			REVISIONS	

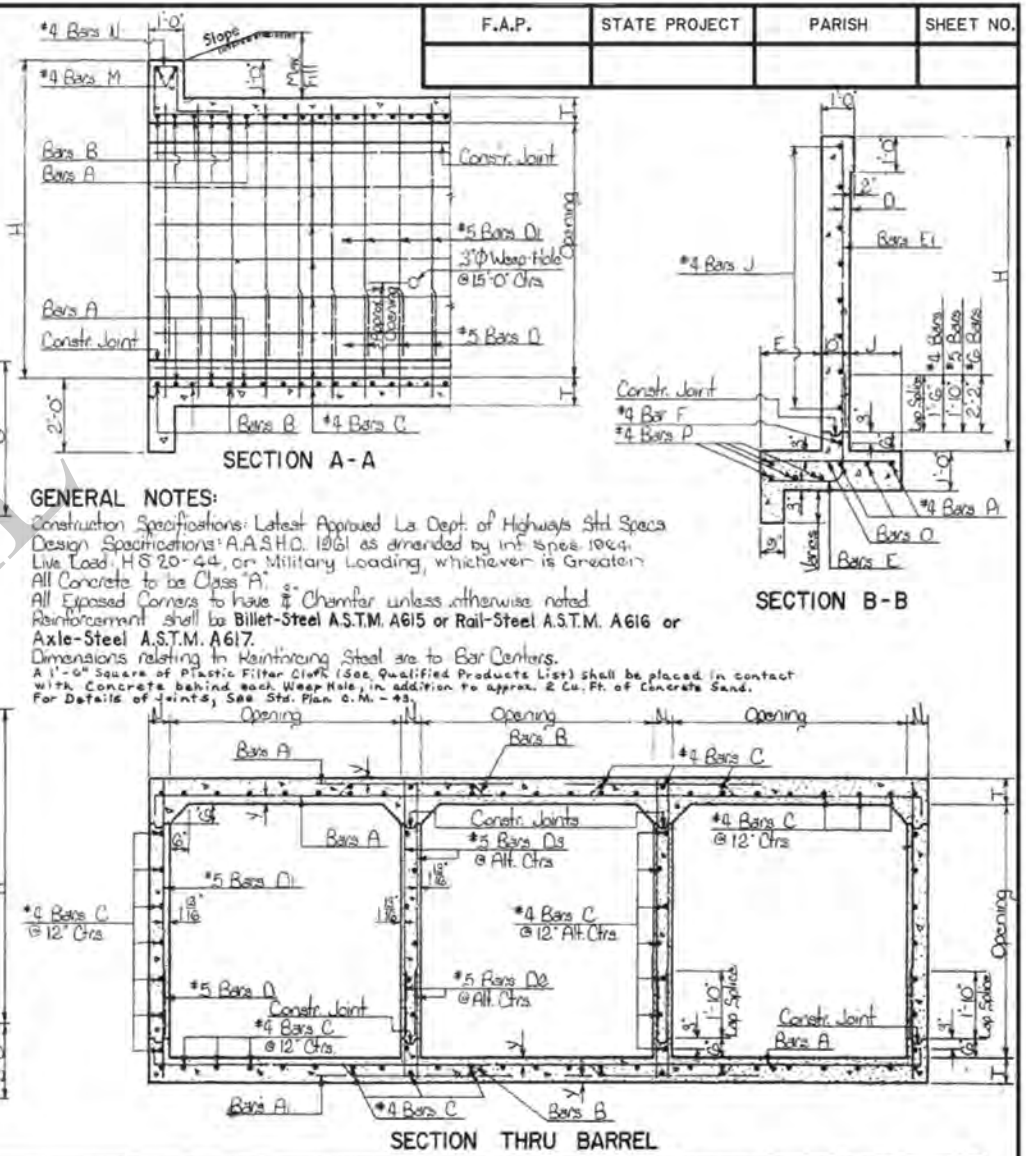
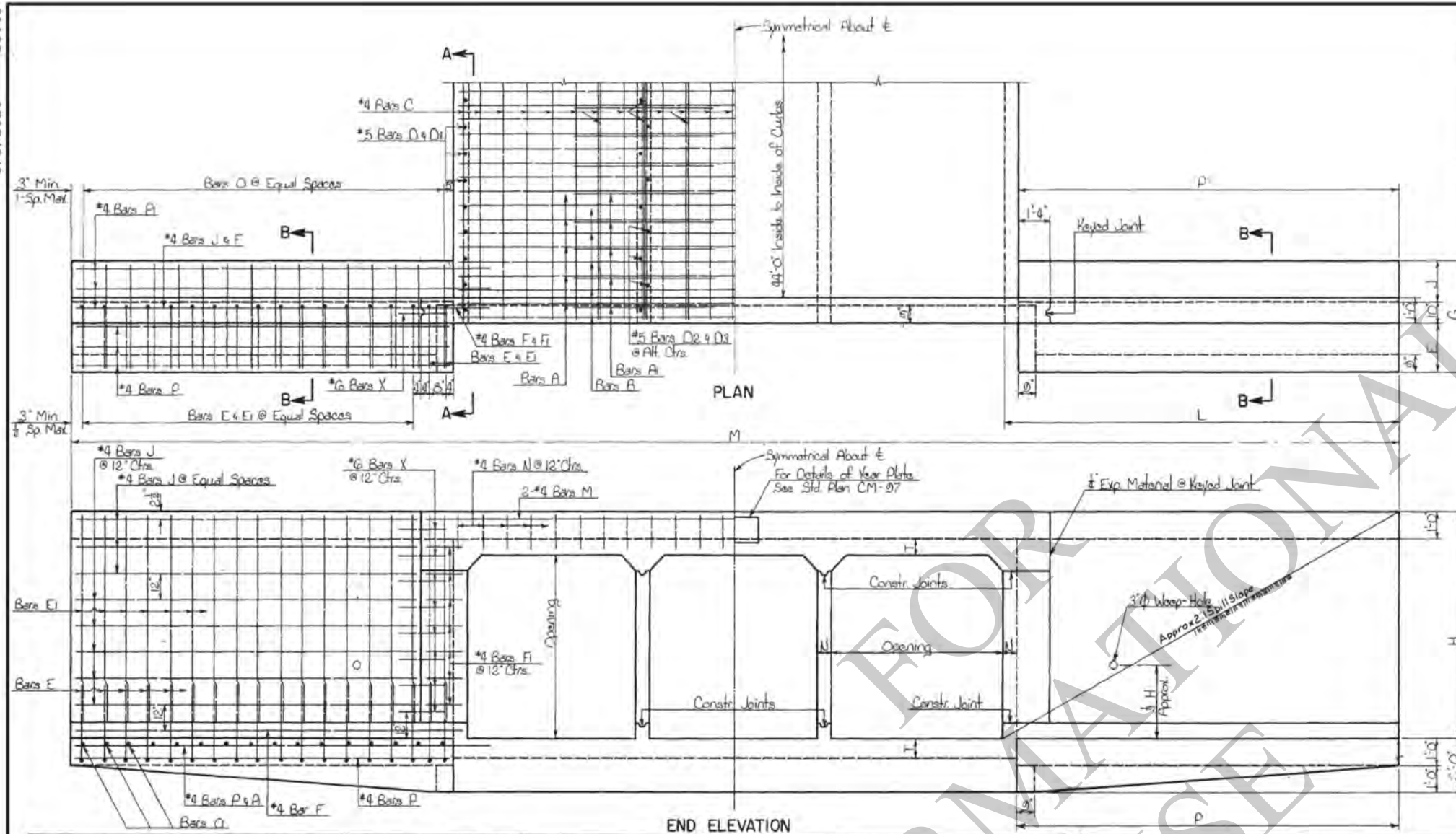
General Notes:
Construction Specifications: Latest Approved La Dept.
of Highways Standard Specifications.
Design Specifications A. A. S. H. O. (1961) as Amended by
Int. Spec. 1964.
Live Load H-20-44, or Military Loading, whichever is Greater.
All Concrete to be Class "A".
All Exposed Corners to have 3/4" Chamfer, unless
otherwise noted.
Reinforcement shall be Miller-Steel A. S. T. M.
A 615 or Roll-Steel A. S. T. M. A 616 or
Axle-Steel A. S. T. M. A 617.
Dimensions Relating to Reinforcing Steel are to Bar
Centers.
A 1'-6" Square of Plastic Filter Cloth (See Qualified
Products List) shall be placed in contact with Concrete
behind each Weep Hole, in addition to approx. 2 Cu. Ft.
of Concrete Sand.

Opening	Bar Size	R	X	Y
7' x 7'	#4	2'-2"	2'-7"	2'-5"
8' x 8'	#5	2'-10"	2'-10"	2'-7"
9' x 9'	#5	2'-11"	2'-10"	2'-9"
10' x 10'	#6	3'-8"	3'-12"	3'-0"

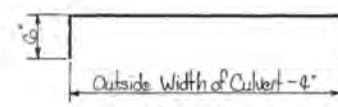
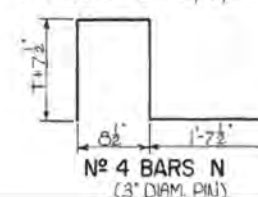
DARS E
 STANDARD PLAN
 MULTIPLE OPENINGS
 REINFORCED CONCRETE BOX CULVERTS
 STRAIGHT WINGS 60' CROSSING
 2:1 SPILL SLOPE NORMAL TO CHANNEL
 DATED October 25, 1968 7' x 7' TO 10' x 10'

STATE OF LOUISIANA		
DEPARTMENT OF HIGHWAYS		
DESIGNED <u>G.A.M.Y.Y.</u>	DETAILED <u>P.R. - 4</u>	TRACED <u>C. J. J.</u>
CHECKED <u>P.C. Mawmon</u>	CHECKED <u>P.C. Mawmon</u>	CHECKED <u>P.C. Mawmon</u>
BRIDGE DESIGN SECTION		

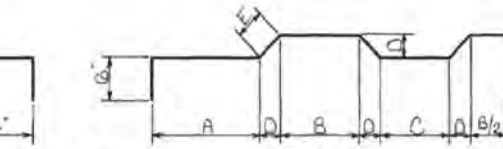


[illegible]

- ① Includes 1-1'-6" Lap Splice
- ② Includes 1-2'-2" Lap Splice
- ③ Includes 1-2'-7" Lap Splice



BARS A



Approved by _____

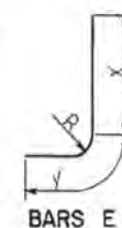
Approved by Dennis D.
Chief Engineer

B

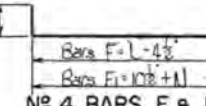
1-5-71
Date

DIMENSIONS FOR BARS B						DIMENSIONS FOR BARS E					
SIZE	PLATE THICKNESS	A	B	C	D	E	SIZE	PLATE THICKNESS	R	X	Y
7 x 7	4 1/2"	5-5/8"	3-0"	3-1/4"	4 1/2"	6 1/2"	7 x 7	4	2 1/2"	2-7/8"	2-5/8"
8 x 8	5"	6-3/8"	4-0"	3-5/8"	5"	7"	8 x 8	5	2"	2-1/2"	2-5/8"
9 x 9	5 1/2"	7-1/8"	4-3/4"	4-0"	5 1/2"	8 1/2"	9 x 9	5 1/2	2 1/8"	2-1/2"	2-5/8"
10 x 10	5 3/4"	7-13/16"	5-0"	4-5"	6"	9"	10 x 10	5 3/4	3"	3-1/8"	3-0"

CC-S-M-7-10-S-90°. I



BARS



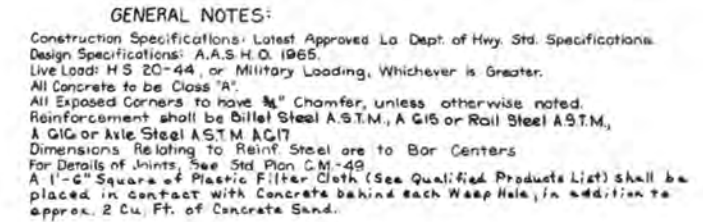
N-4 BARS 1 @
(3" PIN DIAM) 1-21
G-0

5-7	Rev. Weap Hole Note
1-25-76	Rev. Slope Intercept
6-7-78	Rev. General Notes for Steep
6-27-79	Added Axis Steel
12-16-84	Rev. General Notes
4-3-84	DEFORMED DIMELS "X" TO SMOOTH
DATE	DESCRIPTION
REVISIONS	

STANDARD PLAN
MULTIPLE OPENINGS
REINF. CONCRETE BOX CULVERTS
STRAIGHT HDWLS. 2:1 SPILL SLOPE
7'x7' TO 10'x10'

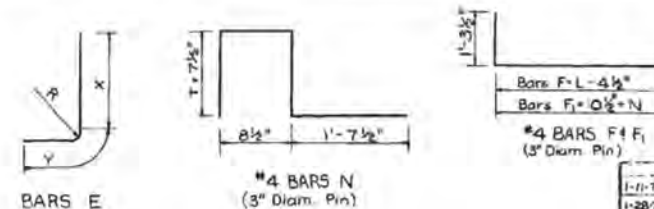
DATED Sept. 13, 1960

STATE OF LOUISIANA		
DEPARTMENT OF HIGHWAYS		
DESIGNED <i>M. Yoshie</i>	DETAILED <i>H. Allen</i>	TRACED <i>C. Jol</i>
CHECKED <i>P. C. Maran</i>	CHECKED <i>P. C. Maran</i>	CHECKED <i>M. Yoshie</i>
BRIDGE DESIGN SECTION		

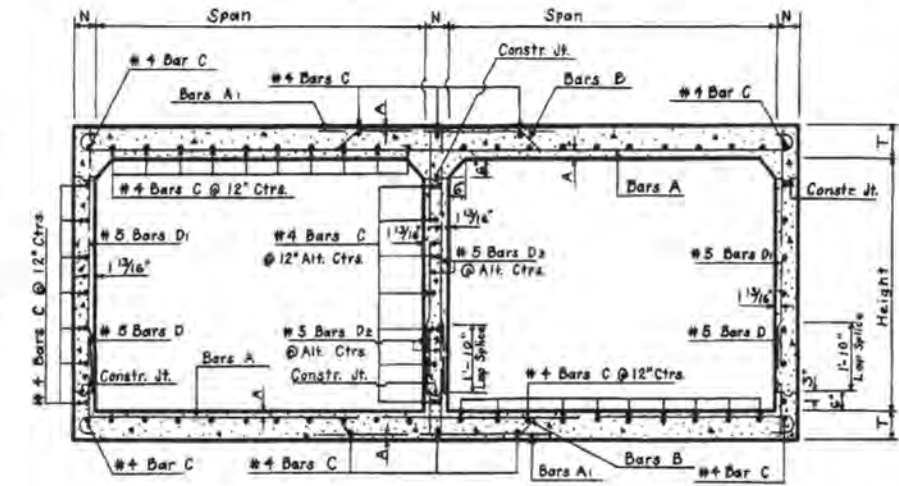
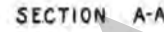
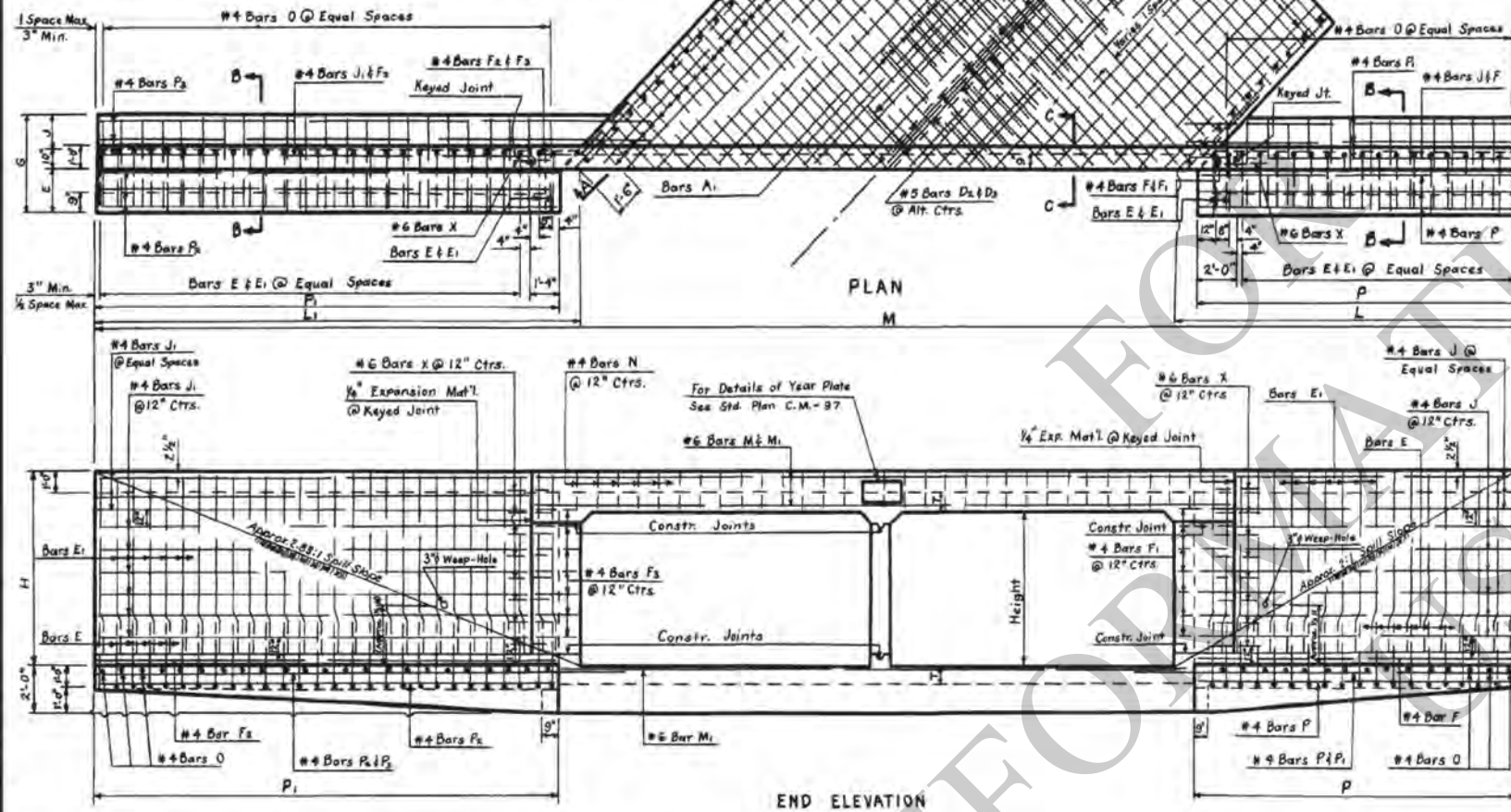
[illegible]

Technical drawings of two reinforcement bar configurations, #6 BARS A and #6 BARS B, for a culvert. Bar A is a single continuous bar with a U-shaped end, showing dimensions for lap splices (1'-10" and 1'-2"), a 5 1/4" width, and a 1" thickness. Bar B is a bent-up bar with a U-shaped end, showing dimensions for lap splices (1'-10" and 1'-2"), a 5 1/4" width, a 1" thickness, and a 1/2" width. The drawings are labeled "Outside Width of Culvert - 5 1/4\"" and "1\"".

SIZE	BAR SIZE	R	X	V
8'x7'	*4	2'4"	2'-7"	2'-5"
9'x7'	*4	2'4"	2'-7"	2'-5"
9'x8'	*5	2'4"	2'-10"	2'-7"



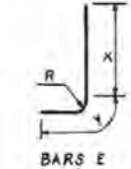
STATE OF LOUISIANA		
DEPARTMENT OF HIGHWAYS		
DESIGNED W. E. M.	DETAILED J. R.	TRACED M. B. R.
CHECKED N. K. B.	CHECKED C. D. J.	CHECKED <i>W. E. M.</i>
IN CHARGE OF		



SECTION THRU BARREL



#4 BARS F#



BARS

Opening	Bar Size	R	X	Y
10'x 7'	#4	2'4"	2'7"	2'6"
10'x 8'	#5	2'3 ¹¹ / ₁₆ "	2'10 ¹ / ₁₆ "	2'7 ¹ / ₁₆ "
10'x 9'	#5	2'3 ¹ / ₁₆ "	2'10 ¹ / ₁₆ "	2'9 ¹ / ₁₆ "

SIZE	A	B	C	D	E
10"x7"	7'-5 1/2"	5'-1 1/2"	4'-5 3/4"	6 1/8"	8 3/8"
10"x8"	7'-6 1/2"	5'-2 1/2"	4'-5 3/4"	6 1/8"	8 3/8"
10"x9"	7'-6 1/2"	5'-2 1/2"	4'-5 3/4"	6 1/8"	8 3/8"

DIMENSIONS																		QUANTITIES FOR 60'-0" ALONG 1' OF CULVERT				
OPENINGS			MAX. FILL	BARREL		WINGS AND CURBS												PER LINEAR FOOT OF BARREL		TOTAL QUANTITIES		
SIZE	NO	AREA	SLAB	WALL	T	N	A	E	J	G	D	H	L	Li	P	Pi	M	STEEL	CONC.	STEEL	CONC. #	
FT.		SQ. FT.	FT.	IN.	IN.	IN.	FT-IN	FT-IN	FT-IN	IN.	FT-IN	FT-IN	FT-IN	FT-IN	FT-IN	FT-IN	FT-IN	LBS.	CU. YDS.	LBS.	CU. YDS.	
10x7	2	140	6															69-9 3/4	270.30	4.8951	19816	156.92
	3	210		8	10	8	1 1/4	1-11	1-8	4-5	1 3/4	8-10	16-10 1/2	23-8 1/2	15-11	22-9		84-10 7/8	405.93	2.7386	29456	213.83
	4	280	10															99-11 3/8	559.47	3.5761	39925	268.73
	5	350																115-0 3/8	694.30	4.4167	50713	323.64
	2	160	5															74-7 7/8	277.38	2.0586	20841	177.36
10x8	3	240	10	6	10	9	1 1/4	2-0	2-0	4-10	1 1/4	8-10	18-5 1/2	26-9 1/2	17-5	25-9		83-10 1/4	415.11	2.9537	30477	235.71
	4	320																108-0 1/2	570.94	3.8488	41164	294.06
	5	400																120-2 7/8	708.67	4.7438	52143	352.40
10x9	2	180	5															78-9 3/4	287.96	2.1420	22449	191.48
	3	270	10	5	10	9	1 1/4	2-2	2-4	5-4	1 1/4	10-10	20-4 1/2	29-0 1/2	19-4	28-0		94-0 1/4	423.21	3.0648	32307	251.57
	4	360																109-2 1/8	588.56	3.9877	43216	311.67
	5	450																124-4 7/8	729.81	4.9105	54424	371.76

④ Quantities do not include Expansion Joint Block.

General Notes:

CONSTRUCTION SPECIFICATIONS: Latest Approved L.A. Dept. of Highways 3rd. Specs.

DESIGN SPECIFICATIONS: A.A.S.H.O. 1969 as amended by
Int. Spec. 1971.

LIVE LOAD: HS 20-44 or Military Loading Whichever is Great
All Concrete to be Class "A"
All Exposed Surfaces to have 3/8" Chempur Unless Otherwise Noted

Reinforcement Shall Be Billet Steel A.S.T.M.
A615 or Rail-Steel A.S.T.M. A616 or

7 Axle-Steel A.S.T.M. A 617.
Dimensions relating to Reinforcing Steel are to Bar Ctrs.

Products List) shall be placed in contact with Concrete Weep Hole, in addition to approx. 2 Cu. Ft. of Concrete Weep Hole.

STANDARD PLAN

REINFORCED CONCRETE BOX CULVERTS

STRAIGHT WINGS 45° CROSSING
2:1 SPILL SLOPE NORMAL TO CHANNEL

DATE: March 20, 1972 10'x 7' TO 10'x 9'

STATE OF LOUISIANA
DEPARTMENT OF HIGHWAYS

DESIGNED	DETAILED J.D. BACCI	TRACED E.B.
----------	---------------------	-------------

Y	CHECKED	CHECKED H. BAROUSSE	CHECKED J. L.

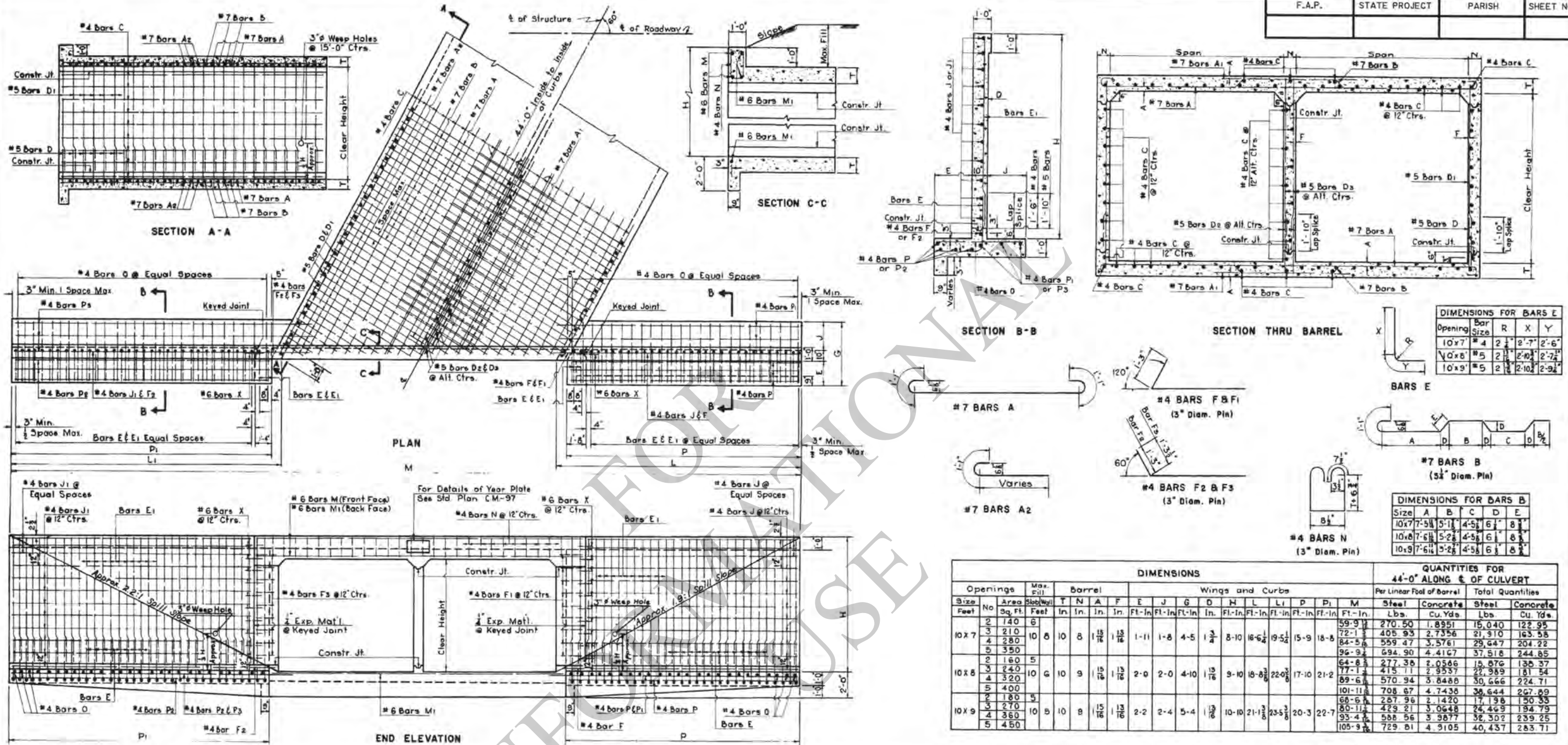
[illegible]

① Includes one 1'-6" Lap Splice.
 ② Includes one 2'-7" Lap Splice.
 ③ Includes one 2'-2" Lap Splice.
 ④ Does not include Lap Splice. When Length of Bar Exceeds 40'-0" add 2'-7" Lap Splice.

(A) * 6 Bars 1 to be $\frac{3}{4}$ " ϕ Smooth and Greased for 1'-0" of Length.

APPROVED BY: Dennis D. White 1-11-78
CHIEF ENGINEER DATE

1-11-78 Rev. Weep Hole Note		W.T.J.	STATE OF LOUISIANA		
G-10-75 Revised Slope Intercept		H.T.J.	DEPARTMENT OF HIGHWAYS		
G-8-72 Rev General Notes for Steel		W.E.M.	DESIGNED	DETAILED J.D. BACCI	TRACED E.B. ALLEN
DATE	DESCRIPTION	BY	CHECKED	CHECKED H. BAROUSSE	CHECKED J.D. BACCI
REVISIONS					



DIMENSIONS																				QUANTITIES FOR 44'-0" ALONG & OF CULVERT				
Openings			Max. Fill	Barrel			Wings and Curbs														Per Linear Foot of Barrel		Total Quantities	
Size	No.	Area	Vol.	T	N	A	F	E	J	G	D	H	L	I	P	M	Steel	Concrete	Steel	Concrete				
Feet		Sq. Ft.	Feet	In.	In.	In.	In.	Fl.-In.	Fl.-In.	Fl.-In.	In.	Fl.-In.	Fl.-In.	Fl.-In.	Fl.-In.	Fl.-In.	Lbs.	Cu. Yds.	Lbs.	Cu. Yds.				
10x7	2	140	6	10	8	10	8	1-11	1-8	4-5	1-3	8-10	16-6	19-5	15-9	18-8	59-9	270.50	1.8551	15,040	122.95			
	3	210															72-1	405.93	2.7356	21,310	163.58			
	4	280															84-5	559.47	3.5761	29,447	204.22			
	5	350															96-9	694.90	4.4167	37,518	244.85			
10x8	2	160	5	10	9	10	9	2-0	2-0	4-10	1-3	9-10	18-8	22-0	17-10	21-2	64-8	277.38	2.0566	15,876	135.37			
	3	240															77-1	435.11	2.9537	22,989	181.54			
	4	320															89-6	570.94	3.8488	30,666	224.71			
	5	400															101-11	708.67	4.7438	36,644	267.69			
10x9	2	180	5	10	10	10	10	2-2	2-4	5-4	1-3	10-10	21-3	23-3	20-3	22-7	68-6	287.96	2.1420	17,196	150.33			
	3	270															80-11	429.21	3.0648	24,469	194.79			
	4	360															93-4	588.56	3.9877	32,302	239.25			
	5	450															105-9	729.81	4.9105	40,437	283.71			

BARREL REINFORCEMENT																								WINGS AND CURBS REINFORCEMENT																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																	
OPENINGS		# 7 BARS A				# 7 BARS A1				# 7 BARS A2				# 7 BARS B				# 5 BARS D1				# 5 BARS D2				# 5 BARS D3				# 5 BARS D4				# 5 BARS D5				# 5 BARS D6				# 5 BARS D7				# 5 BARS D8				# 5 BARS D9				# 5 BARS D10				# 5 BARS D11				# 5 BARS D12				# 5 BARS D13				# 5 BARS D14				# 5 BARS D15				# 5 BARS D16				# 5 BARS D17				# 5 BARS D18				# 5 BARS D19				# 5 BARS D20				# 5 BARS D21				# 5 BARS D22				# 5 BARS D23				# 5 BARS D24				# 5 BARS D25				# 5 BARS D26				# 5 BARS D27				# 5 BARS D28				# 5 BARS D29				# 5 BARS D30				# 5 BARS D31				# 5 BARS D32				# 5 BARS D33				# 5 BARS D34				# 5 BARS D35				# 5 BARS D36				# 5 BARS D37				# 5 BARS D38				# 5 BARS D39				# 5 BARS D40				# 5 BARS D41				# 5 BARS D42				# 5 BARS D43				# 5 BARS D44				# 5 BARS D45				# 5 BARS D46				# 5 BARS D47				# 5 BARS D48				# 5 BARS D49				# 5 BARS D50				# 5 BARS D51				# 5 BARS D52				# 5 BARS D53				# 5 BARS D54				# 5 BARS D55				# 5 BARS D56				# 5 BARS D57				# 5 BARS D58				# 5 BARS D59				# 5 BARS D60				# 5 BARS D61				# 5 BARS D62				# 5 BARS D63				# 5 BARS D64				# 5 BARS D65				# 5 BARS D66				# 5 BARS D67				# 5 BARS D68				# 5 BARS D69				# 5 BARS D70				# 5 BARS D71				# 5 BARS D72				# 5 BARS D73				# 5 BARS D74				# 5 BARS D75				# 5 BARS D76				# 5 BARS D77				# 5 BARS D78				# 5 BARS D79				# 5 BARS D80				# 5 BARS D81				# 5 BARS D82				# 5 BARS D83				# 5 BARS D84				# 5 BARS D85				# 5 BARS D86				# 5 BARS D87				# 5 BARS D88				# 5 BARS D89				# 5 BARS D90				# 5 BARS D91				# 5 BARS D92				# 5 BARS D93				# 5 BARS D94				# 5 BARS D95				# 5 BARS D96				# 5 BARS D97				# 5 BARS D98				# 5 BARS D99				# 5 BARS D100				# 5 BARS D101				# 5 BARS D102				# 5 BARS D103				# 5 BARS D104				# 5 BARS D105				# 5 BARS D106				# 5 BARS D107				# 5 BARS D108				# 5 BARS D109				# 5 BARS D110				# 5 BARS D111				# 5 BARS D112				# 5 BARS D113				# 5 BARS D114				# 5 BARS D115				# 5 BARS D116				# 5 BARS D117				# 5 BARS D118				# 5 BARS D119				# 5 BARS D120				# 5 BARS D121				# 5 BARS D122				# 5 BARS D123				# 5 BARS D124				# 5 BARS D125				# 5 BARS D126				# 5 BARS D127				# 5 BARS D128				# 5 BARS D129				# 5 BARS D130				# 5 BARS D131				# 5 BARS D132				# 5 BARS D133				# 5 BARS D134				# 5 BARS D135				# 5 BARS D136				# 5 BARS D137				# 5 BARS D138				# 5 BARS D139				# 5 BARS D140				# 5 BARS D141				# 5 BARS D142				# 5 BARS D143				# 5 BARS D144				# 5 BARS D145				# 5 BARS D146				# 5 BARS D147				# 5 BARS D148				# 5 BARS D149				# 5 BARS D150				# 5 BARS D151				# 5 BARS D152				# 5 BARS D153				# 5 BARS D154				# 5 BARS D155				# 5 BARS D156				# 5 BARS D157				# 5 BARS D158				# 5 BARS D159				# 5 BARS D160				# 5 BARS D161				# 5 BARS D162				# 5 BARS D163				# 5 BARS D164				# 5 BARS D165				# 5 BARS D166				# 5 BARS D167				# 5 BARS D168				# 5 BARS D169				# 5 BARS D170				# 5 BARS D171				# 5 BARS D172				# 5 BARS D173				# 5 BARS D174				# 5 BARS D175				# 5 BARS D176				# 5 BARS D177				# 5 BARS D178				# 5 BARS D179				# 5 BARS D180				# 5 BARS D181				# 5 BARS D182				# 5 BARS D183				# 5 BARS D184				# 5 BARS D185				# 5 BARS D186				# 5 BARS D187				# 5 BARS D188				# 5 BARS D189				# 5 BARS D190				# 5 BARS D191				# 5 BARS D192				# 5 BARS D193				# 5 BARS D194				# 5 BARS D195				# 5 BARS D196				# 5 BARS D197				# 5 BARS D198				# 5 BARS D199				# 5 BARS D200				# 5 BARS D201				# 5 BARS D202				# 5 BARS D203				# 5 BARS D204				# 5 BARS D205				# 5 BARS D206				# 5 BARS D207				# 5 BARS D208				# 5 BARS D209				# 5 BARS D210				# 5 BARS D211				# 5 BARS D212				# 5 BARS D213				# 5 BARS D214				# 5 BARS D215				# 5 BARS D216				# 5 BARS D217				# 5 BARS D218				# 5 BARS D219				# 5 BARS D220				# 5 BARS D221				# 5 BARS D222				# 5 BARS D223				# 5 BARS D224				# 5 BARS D225				# 5 BARS D226				# 5 BARS D227				# 5 BARS D228				# 5 BARS D229				# 5 BARS D230				# 5 BARS D231				# 5 BARS D232				# 5 BARS D233				# 5 BARS D234				# 5 BARS D235				# 5 BARS D236				# 5 BARS D237				# 5 BARS D238				# 5 BARS D239				# 5 BARS D240				# 5 BARS D241				# 5 BARS D242				# 5 BARS D243				# 5 BARS D244				# 5 BARS D245				# 5 BARS D246				# 5 BARS D247				# 5 BARS D248				# 5 BARS D249				# 5 BARS D250				# 5 BARS D251				# 5 BARS D252				# 5 BARS D253				# 5 BARS D254				# 5 BARS D255				# 5 BARS D256				# 5 BARS D257				# 5 BARS D258				# 5 BARS D259				# 5 BARS D260				# 5 BARS D261				# 5 BARS D262				# 5 BARS D263				# 5 BARS D264				# 5 BARS D265				# 5 BARS D266				# 5 BARS D267				# 5 BARS D268				# 5 BARS D269				# 5 BARS D270				# 5 BARS D271				# 5 BARS D272				# 5 BARS D273				# 5 BARS D274				# 5 BARS D275				# 5 BARS D276				# 5 BARS D277				# 5 BARS D278				# 5 BARS D279				# 5 BARS D280				# 5 BARS D281				# 5 BARS D282				# 5 BARS D283				# 5 BARS D284				# 5 BARS D285				# 5 BARS D286				# 5 BARS D287				# 5 BARS D288				# 5 BARS D289				# 5 BARS D290				# 5 BARS D291				# 5 BARS D292				# 5 BARS D293				# 5 BARS D294				# 5 BARS D295				# 5 BARS 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5 BARS D414				# 5 BARS D415				# 5 BARS D416				# 5 BARS D417				# 5 BARS D418				# 5 BARS D419				# 5 BARS D420				# 5 BARS D421				# 5 BARS D422				# 5 BARS D423				# 5 BARS D424				# 5 BARS D425				# 5 BARS D426				# 5 BARS D427				# 5 BARS D428				# 5 BARS D429				# 5 BARS D430				# 5 BARS D431				# 5 BARS D432				# 5 BARS D433				# 5 BARS D434				# 5 BARS D435				# 5 BARS D436				# 5 BARS D437				# 5 BARS D438				# 5 BARS D439				# 5 BARS D440				# 5 BARS D441				# 5 BARS D442				# 5 BARS D443				# 5 BARS D444				# 5 BARS D445				# 5 BARS D446				# 5 BARS D447				# 5 BARS D448				# 5 BARS D449				# 5 BARS D450				# 5 BARS D451				# 5 BARS D452				# 5 BARS D453				# 5 BARS D454				# 5 BARS D455				# 5 BARS D456				# 5 BARS D457				# 5 BARS D458				# 5 BARS D459				# 5 BARS D460				# 5 BARS D461				# 5 BARS D462				# 5 BARS D463				# 5 BARS D464				# 5 BARS D465				# 5 BARS D466				# 5 BARS D467				# 5 BARS D468				# 5 BARS D469				# 5 BARS D470				# 5 BARS D471				# 5 BARS 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BARS D531				# 5 BARS D532				# 5 BARS D533				# 5 BARS D534				# 5 BARS D535				# 5 BARS D536				# 5 BARS D537				# 5 BARS D538				# 5 BARS D539				# 5 BARS D540				# 5 BARS D541				# 5 BARS D542				# 5 BARS D543				# 5 BARS D544				# 5 BARS D545				# 5 BARS D546				# 5 BARS D547				# 5 BARS D548				# 5 BARS D549				# 5 BARS D550				# 5 BARS D551				# 5 BARS D552				# 5 BARS D553				# 5 BARS D554				# 5 BARS D555				# 5 BARS D556				# 5 BARS D557				# 5 BARS D558				# 5 BARS D559				# 5 BARS D560				# 5 BARS D561				# 5 BARS D562				# 5 BARS D563				# 5 BARS D564				# 5 BARS D565				# 5 BARS D566				# 5 BARS D567				# 5 BARS D568				# 5 BARS D569				# 5 BARS D570				# 5 BARS D571				# 5 BARS D572				# 5 BARS D573				# 5 BARS D574				# 5 BARS D575				# 5 BARS D576				# 5 BARS D577				# 5 BARS D578				# 5 BARS D579				# 5 BARS D580				# 5 BARS D581				# 5 BARS D582				# 5 BARS D583				# 5 BARS D584				# 5 BARS D585				# 5 BARS D586				# 5 BARS D587				# 5 BARS D588				# 5 BARS D589				# 5 BARS D590				# 5 BARS D591				# 5 BARS D592				# 5 BARS D593				# 5 BARS D594				# 5 BARS D595				# 5 BARS D596				# 5 BARS D597				# 5 BARS D598				# 5 BARS D599				# 5 BARS D600				# 5 BARS D601				# 5 BARS D602				# 5 BARS D603				# 5 BARS D604				# 5 BARS D605				# 5 BARS D606				# 5 BARS D607				# 5 BARS D608				# 5 BARS D609				# 5 BARS D610				# 5 BARS D611				# 5 BARS D612				# 5 BARS D613				# 5 BARS D614				# 5 BARS D615				# 5 BARS D616				# 5 BARS D617				# 5 BARS D618				# 5 BARS D619				# 5 BARS D620				# 5 BARS D621				# 5 BARS D622				# 5 BARS D623				# 5 BARS D624				# 5 BARS D625				# 5 BARS D626				# 5 BARS D627				# 5 BARS D628				# 5 BARS D629				# 5 BARS D630				# 5 BARS D631				# 5 BARS D632				# 5 BARS D633				# 5 BARS D634				# 5 BARS D635				# 5 BARS D636				# 5 BARS D637				# 5 BARS D638				# 5 BARS D639				# 5 BARS D640				# 5 BARS D641				# 5 BARS D642				# 5 BARS D643				# 5 BARS D644				# 5 BARS D645				# 5 BARS D646				# 5 BARS D647				# 5 BARS D648				# 5 BARS D649				# 5 BARS D650				# 5 BARS D651				# 5 BARS D652				# 5 BARS D653				# 5 BARS D654				# 5 BARS D655				# 5 BARS D656				# 5 BARS D657				# 5 BARS D658				# 5 BARS D659				# 5 BARS D660				# 5 BARS D661				# 5 BARS D662				# 5 BARS D663				# 5 BARS D664				# 5 BARS D665				# 5 BARS D666				# 5 BARS D667				# 5 BARS D668				# 5 BARS D669				# 5 BARS D670				# 5 BARS D671				# 5 BARS D672				# 5 BARS D673				# 5 BARS D674				# 5 BARS D675				# 5 BARS D676				# 5 BARS D677				# 5 BARS D678				# 5 BARS D679				# 5 BARS D680				# 5 BARS D681				# 5 BARS D682				# 5 BARS D683				# 5 BARS D684				# 5 BARS D685				# 5 BARS D686				# 5 BARS D687				# 5 BARS D688				# 5 BARS D689				# 5 BARS D690				# 5 BARS D691				# 5 BARS D692				# 5 BARS D693				# 5 BARS D694				# 5 BARS D695				# 5 BARS D696				# 5 BARS D697				# 5 BARS D698				# 5 BARS D699				# 5 BARS D700				# 5 BARS D701				# 5 BARS D702				# 5 BARS D703				# 5 BARS D704				# 5 BARS D705				# 5 BARS D706				# 5 BARS D707				# 5 BARS D708				# 5 BARS D709				# 5 BARS D710				# 5 BARS D711				# 5 BARS D712				# 5 BARS D713				# 5 BARS D714				# 5 BARS D715				# 5 BARS D716				# 5 BARS D717				# 5 BARS D718				# 5 BARS D719				# 5 BARS D720				# 5 BARS D721				# 5 BARS D722				# 5 BARS D723				# 5 BARS D724				# 5 BARS D725				# 5 BARS D726				# 5 BARS D727				# 5 BARS D728				# 5 BARS D729				# 5 BARS D730				# 5 BARS D731				# 5 BARS D732				# 5 BARS D733				# 5 BARS D734				# 5 BARS D735				# 5 BARS D736				# 5 BARS D737				# 5 BARS D738				# 5 BARS D739				# 5 BARS D740				# 5 BARS D741				# 5 BARS D742				# 5 BARS D743				# 5 BARS D744				# 5 BARS D745				# 5 BARS D746				# 5 BARS D747				# 5 BARS D748				# 5 BARS D749				# 5 BARS D750				# 5 BARS D751				# 5 BARS D752				# 5 BARS D753				# 5 BARS D754				# 5 BARS D755				# 5 BARS D756				# 5 BARS D757				# 5 BARS D758				# 5 BARS D759				# 5 BARS D760				# 5 BARS D761				# 5 BARS D762				# 5 BARS D763				# 5 BARS D764				# 5 BARS D765				# 5 BARS D766				# 5 BARS D767				# 5 BARS D768				# 5 BARS D769				# 5 BARS D770				# 5 BARS D771				# 5 BARS D772				# 5 BARS D773				# 5 BARS D774			

GENERAL NOTES:

Design Specifications: A.A.S.H.O. 1969 as Amended to 1971.

Construction Specifications: Latest Approved Louisiana Department of Highways Standard Specifications.

All Concrete to be Class "A".

All Exposed Corners to Have $\frac{3}{4}$ " Chamfer Unless Otherwise Noted.

Reinforcement Shall be Intermediate or Hard Grade A.S.T.M. A15, or Axle Steel A.S.T.M. A160, or Rail Steel A.S.T.M. A16, Conforming to A.S.T.M. A305.

Dimensions Relating to Reinforcing Steel are to Bar Centers.

A 1'-6" Square of Plastic Filter Cloth (See Qualified Products List) shall be placed in contact with Concrete behind each Weep Hole, in addition to approx. 2 Cu. Ft. of Concrete Sand.

For Details of Joints, See Standard Plan CM-49.

STANDARD PLAN

MULTIPLE OPENINGS

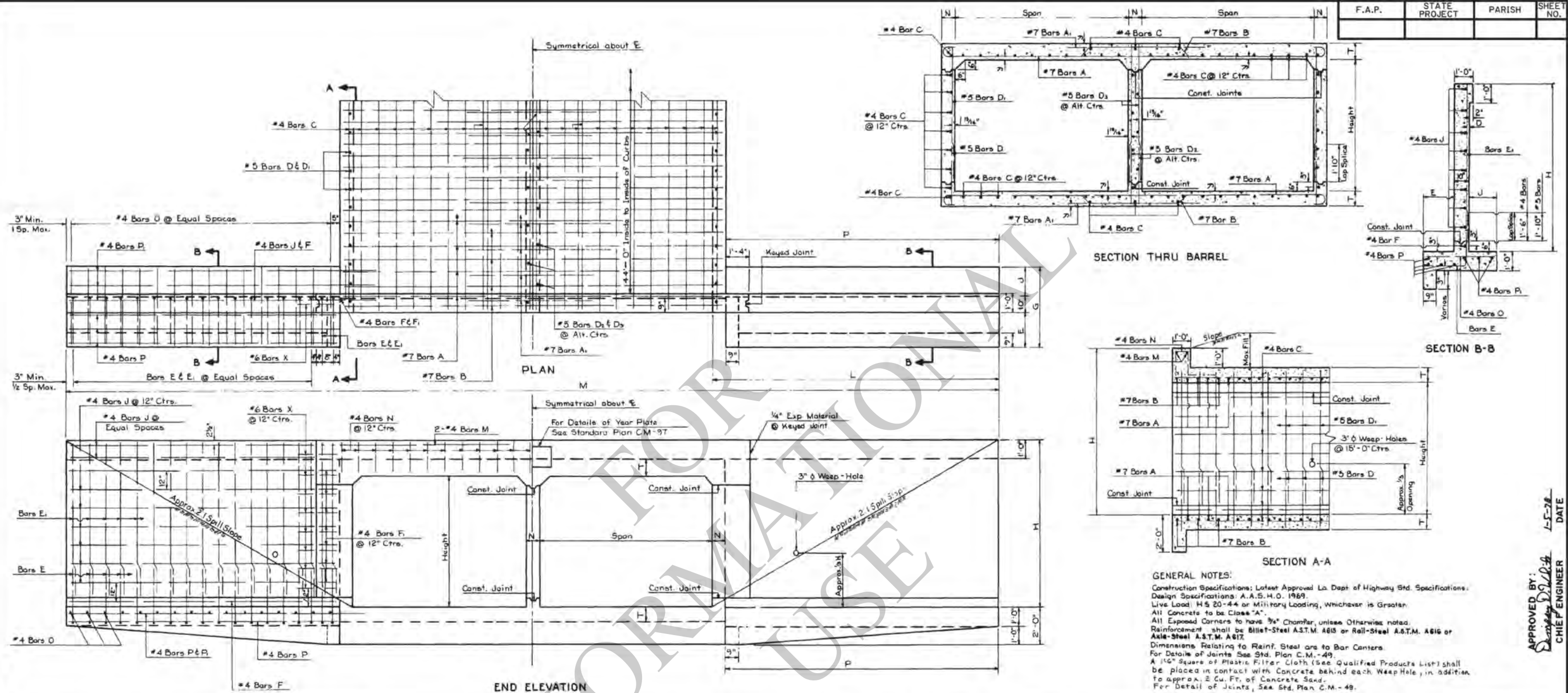
REINFORCED CONCRETE BOX CULVERTS

STRAIGHT WINGS 60° CROSSING

2:1 SPILL SLOPE NORMAL TO CHANNEL

DATED: May 28 1975 10'x7', 10'x8' & 10'x9'

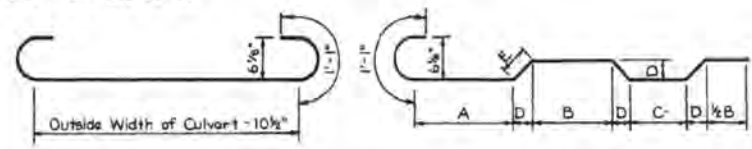
STATE OF LOUISIANA		
DEPARTMENT OF HIGHWAYS		
DESIGNED	DETAILED	TRACED
CHECKED	CHECKED	CHECKED



GENERAL NOTES:
Construction Specifications: Latest Approved La. Dept. of Highway Std. Specifications.
Design Specifications: A.A.S.H.O. 1989.
Live Load: HS 20-44 or Military Loading, whichever is Greater.
All Concrete to be Class "A".
All Exposed Corners to have 3/4" Chamfer, unless Otherwise noted.
Reinforcement shall be Billet-Steel A.S.T.M. A615 or Rail-Steel A.S.T.M. A616 or
Axle-Steel A.S.T.M. A617.
Dimensions Relating to Reinf. Steel are to Bar Centers.
For Details of Joints See Std. Plan C.M.-49.
A 1/4" Square of Plastic Filter Cloth (See Qualified Products List) shall
be placed in contact with Concrete behind each Weep Hole, in addition
to approx. 2 Cu. Ft. of Concrete Sand.
For Detail of Joints, See Std. Plan C.M.-49.

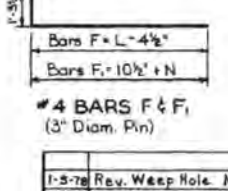
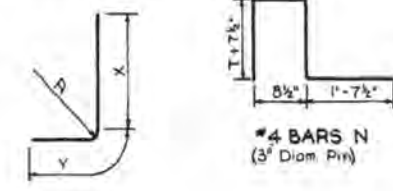
DIMENSIONS															BILL OF REINFORCING STEEL FOR 44'-0" CULVERT																														QUANTITIES				OPEN-																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																														
OPENINGS			MAX.FILL	BARREL											WINGS AND CURBS										BARREL REINFORCEMENT										WINGS AND CURBS REINFORCEMENT										PER LINEAR FOOT OF BARREL		44'-0" CULVERT		INGS																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																														
SIZE	NO.	AREA	SLAB	WALLS	T	N	Y	D	E	J	G	H	L	P	M	BARS A				BARS A ₁				BARS B				BARS C				BARS D & D ₁				BARS D ₂ & D ₃				BARS E				BARS E ₁				BARS F				BARS F ₁				BARS J				BARS O				BARS P				BARS P ₁				BARS N				BARS M				BARS X				REINF. STEEL	CONC.	REINF. STEEL	CONC.	SIZE	NO.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																						
Ft.		Sq.Ft.	Ft.	Ft.	In.	In.	In.	In.	Ft.-In.	Ft.-In.	Ft.-In.	Ft.-In.	Ft.-In.	Ft.-In.	Ft.-In.	Size	No.	Length	Spac.	Size	No.	Length	Spac.	Size	No.	Length	Spac.	Length	No.	Length	Spac.	Length	No.	Length	Spac.	Length	No.	Length	Spac.	Length	No.	Length	Spac.	Length	No.	Length	Spac.	Length	No.	Length	Spac.	Lbs.	Cu.Yds.	Lbs.	Cu.Yds.	Ft.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																							
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#6 Bars "X" to be 3/4" Smooth and Greased for 1'-0" of Length
Includes 1'-6" Lap Splice.
Includes 1'-2" Lap Splice.



DIMENSIONS FOR BARS B						
SIZE	PIN DIAM.	A	B	C	D	E
10'x7'	5/8"	7'-5 1/4"	5'-1 1/4"	4'-5 1/4"	6"	8 1/2"
10'x8'	5/8"	7'-6 1/4"	5'-2 1/4"	4'-5 1/4"	6"	8 1/2"
10'x9'	5/8"	7'-6 1/4"	5'-2 1/4"	4'-5 1/4"	6"	8 1/2"

DIMENSIONS FOR BARS E			
SIZE	BAR SIZE	R	X
10'x7'	#4	2 1/4"	2'-7"
10'x8'	#5	2 3/8"	2'-10"
10'x9'	#5	2 3/8"	2'-10"

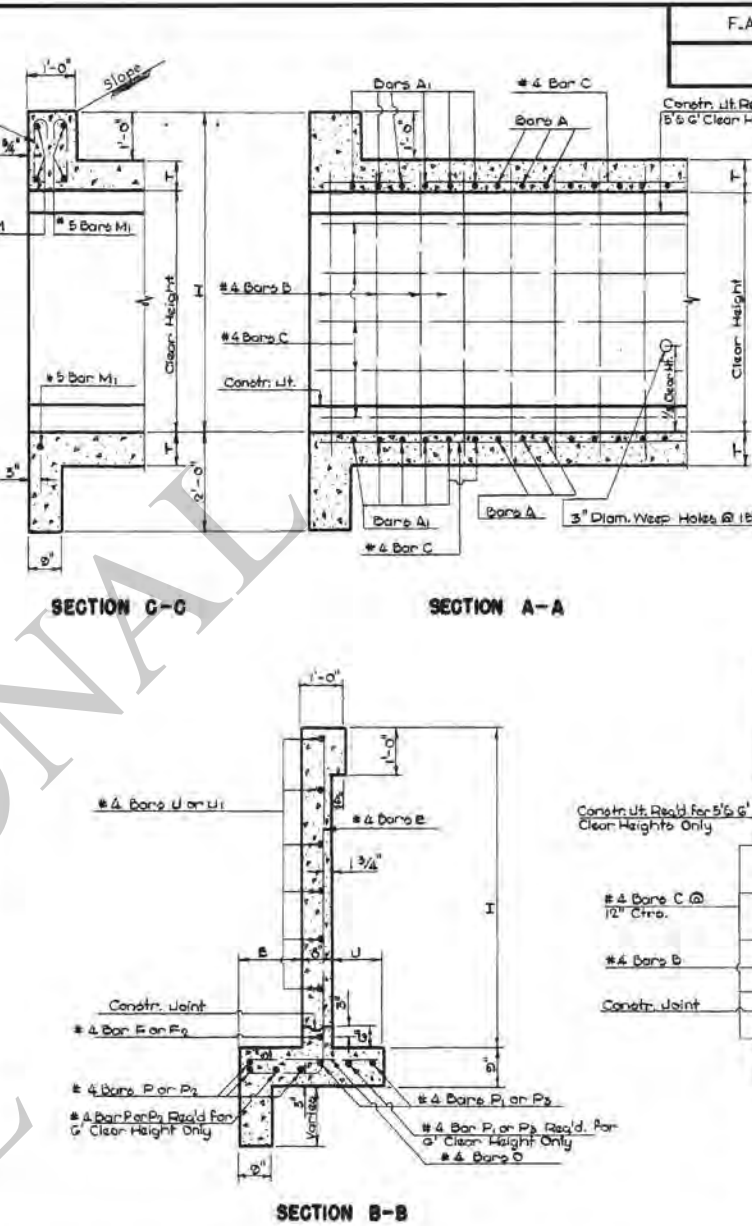
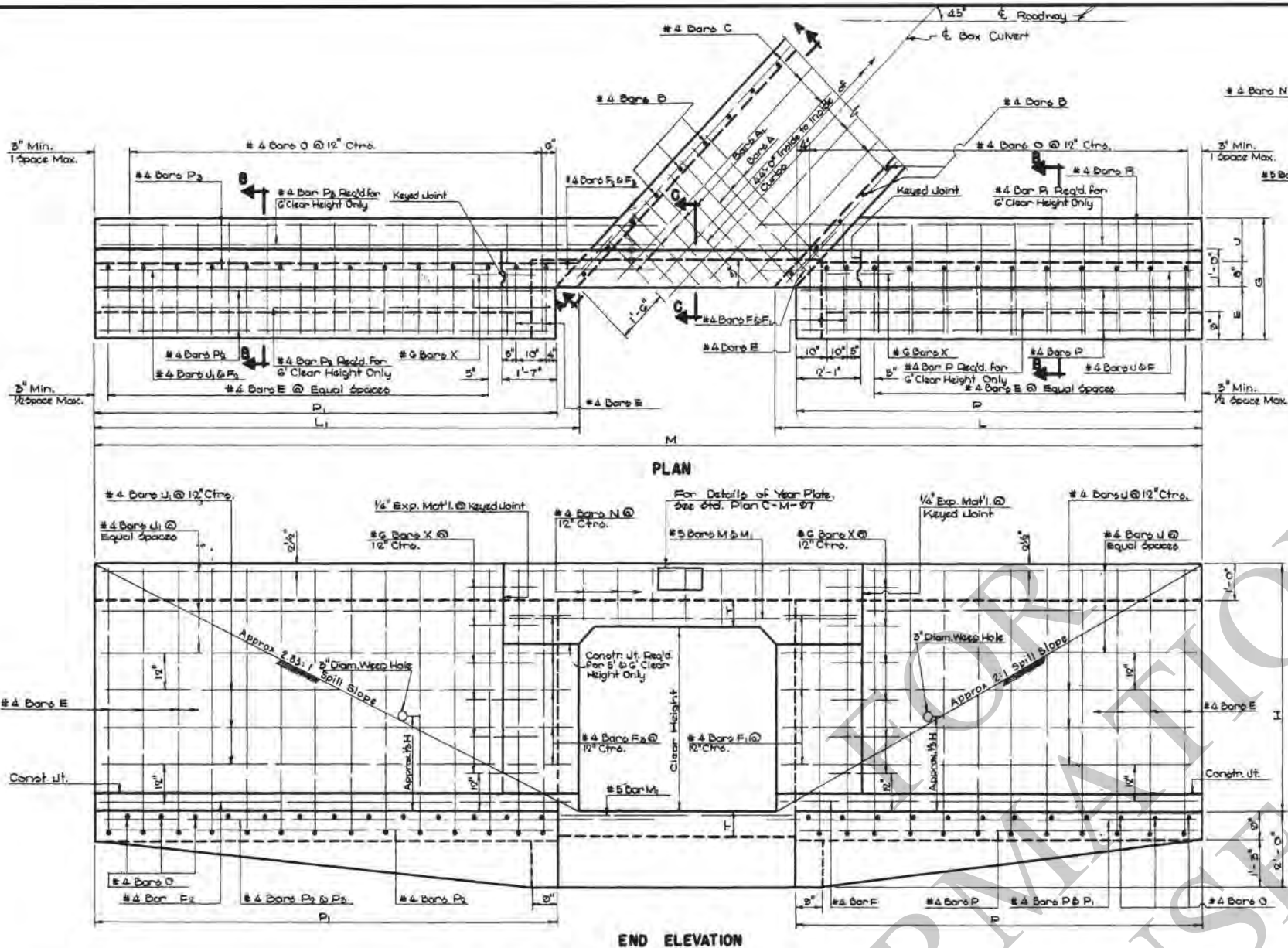


STANDARD PLAN
MULTIPLE OPENINGS
REINF. CONCRETE BOX CULVERT
STRAIGHT HDWLS.
2:1 SPILL SLOPE
10'x7' 10'x8' 10'x9'
DATED Sept. 1, 1971

STATE OF LOUISIANA DEPARTMENT OF HIGHWAYS			
DESIGNED	DETAILED J. D. Bocci	TRACED J. McManus H	
CHECKED	CHECKED J. J. Ribos	CHECKED J. D. Bocci	
IN CHARGE OF			
REVISIONS			
1-5-78	Rev. Weep Hole Note	W.T.J.	
1-28-78	Rev. Slope Intercept	W.T.J.	
6-8-72	Rev. General Notes for Steel	W.E.M.	
DATE	DESCRIPTION	BY	

APPROVED BY: *[Signature]*
DATE: 1-5-78
CHIEF ENGINEER

C.C.S.M-10-R-90-1



GENERAL NOTES:

CONSTRUCTION SPECIFICATIONS: LATEST APPROVED LA. DEPT. OF HIGHWAY STANDARD SPECIFICATIONS.

DESIGN SPECIFICATIONS: A.A.S.H.O. 1961 AS AMENDED BY INT. SPED. 1964 LIVE LOAD HB20-44 OR MILITARY LOADING, WHICHEVER IS GREATER.

ALL CONCRETE TO BE CLASS "A".

ALL EXPOSED CORNERS TO HAVE 3/4" CHAMFER UNLESS OTHERWISE NOTED.

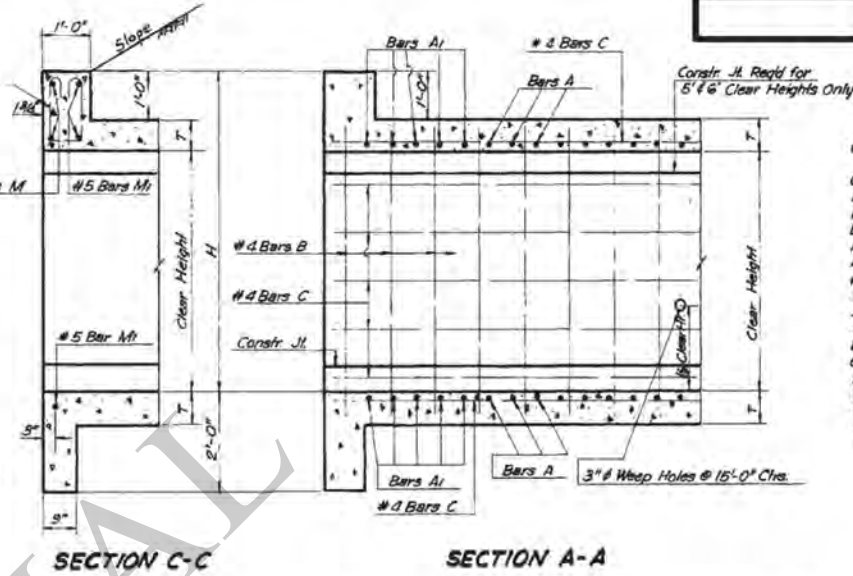
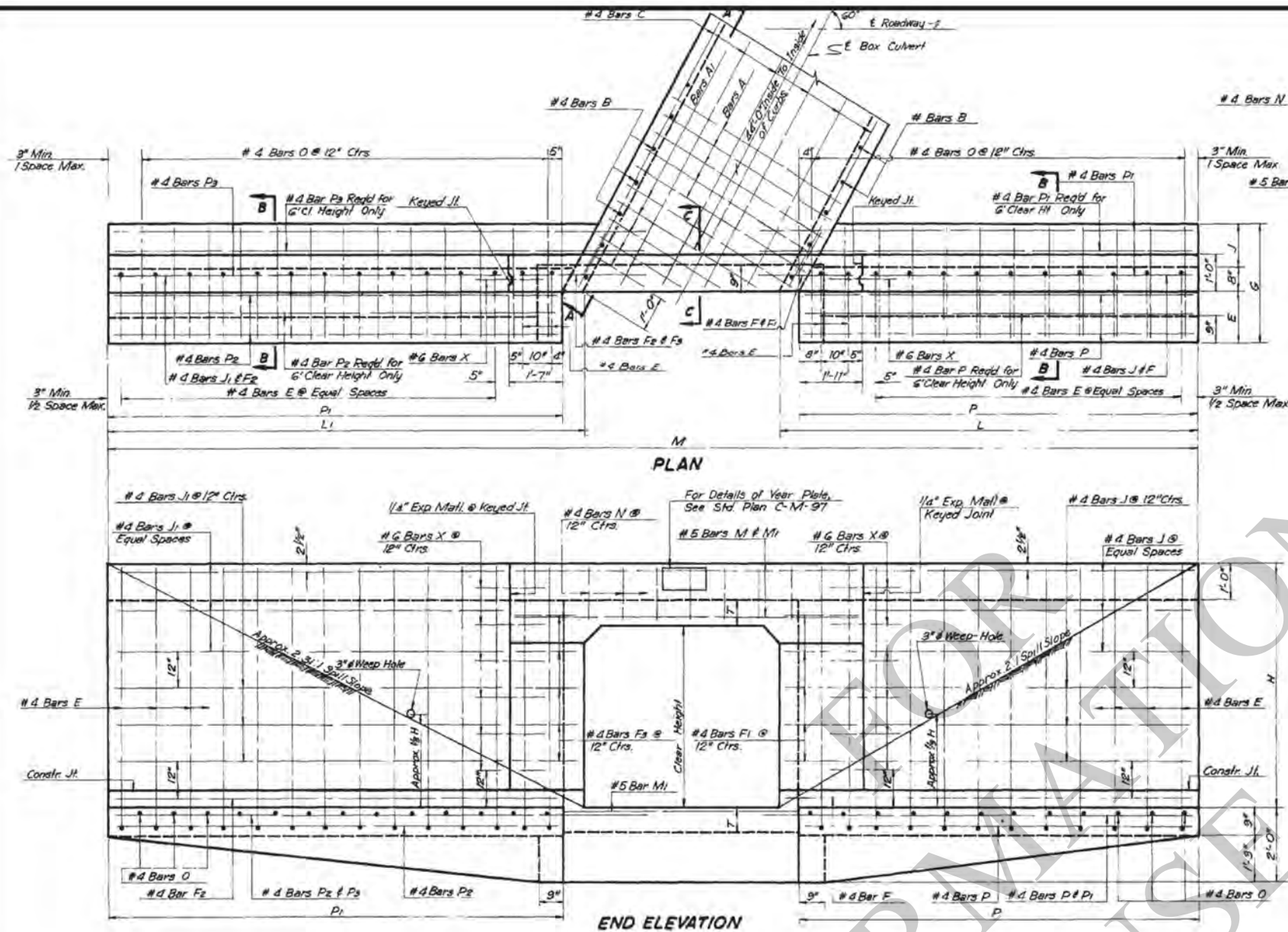
REINFORCEMENT SHALL BE BILLET-STEEL A.S.T.M. A615 OR RAIL-STEEL A.S.T.M. A616 OR AXLE-STEEL A.S.T.M. A617.

DIMENSIONS RELATING TO REINFORCING STEEL ARE TO BAR CENTERS.

A 1'-6" SQUARE OF PLASTIC FILTER CLOTH (SEE QUALIFIED PRODUCTS LIST) SHALL BE PLACED IN CONTACT WITH CONCRETE BEHIND EACH WEIR HOLE, IN ADDITION TO APPROX. 2 CU. FT. OF CONCRETE SAND.

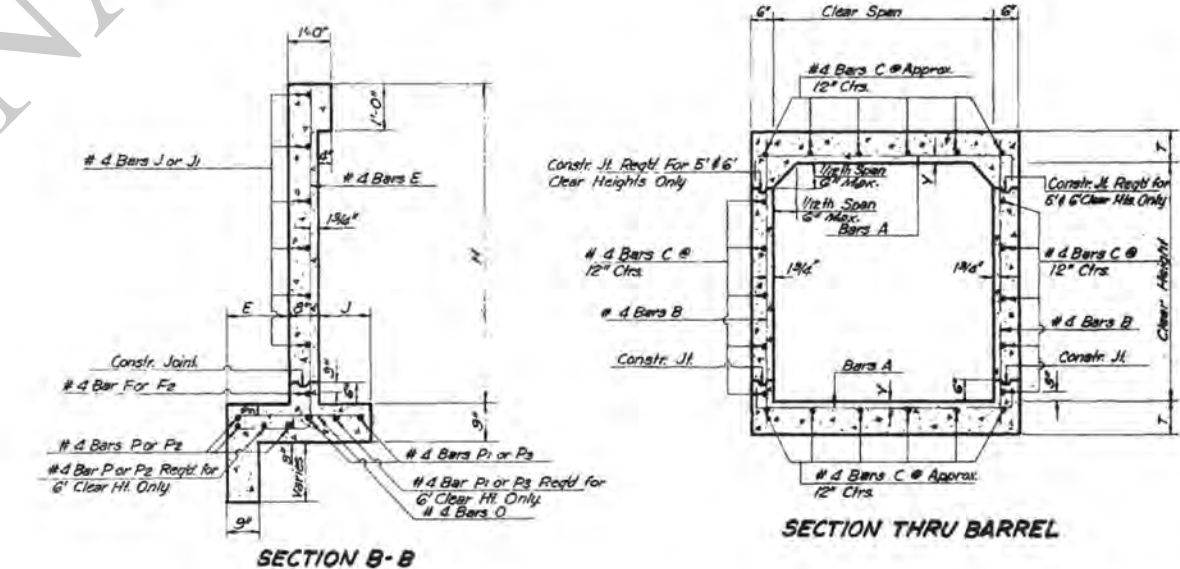
FOR DETAIL OF JOINTS, SEE STD. PLAN C.M.-49.

DIMENSIONS																								BILL OF REINFORCING STEEL FOR 44'-0" CULVERT																																																QUANTITIES				OPENINGS																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																										
OPENINGS			MAX.FILL		BARREL		WINGS AND CURBS																	BARREL REINFORCEMENT																	WINGS AND CURB REINFORCEMENT														PER LINEAR FT. OF BARREL		44'-0" CULVERT																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																													
CLEAR SPAN	CLEAR HEIGHT	AREA	GLAD WALL	A	T	Y	E	U	O	H	L	L	P	D	M	BARS A				BARS A1				#4 BARS B			#4 BARS C			#4 BARS E			#4 BARS F			#4 BARS F2			#4 BARS F3			#4 BARS J			#4 BARS J1			#4 BARS N			#4 BARS O			#4 BARS P			#4 BARS F4			#4 BARS P2			#4 BARS P3			#5 BARS M			#5 BARS M1			#5 BARS X			STEEL	CONC.	STEEL	CONC.	CLEAR SPAN	CLEAR HEIGHT																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																						
FT.	FT.	SQ.FT.	FT.	FT.	IN.	IN.	IN.	FT.-IN.	FT.-IN.	FT.-IN.	FT.-IN.	FT.-IN.	FT.-IN.	FT.-IN.	FT.-IN.	SIZE	NO.	LGTH.	SPAC.	SIZE	NO.	SHORT BAR	VAR.	LONG BAR	SPAC.	NO.	LGTH.	SPAC.	NO.	LGTH.	NO.	LGTH.	SPAC.	NO.	LGTH.	NO.	LGTH.	NO.	LGTH.	NO.	LGTH.	NO.	LGTH.	NO.	LGTH.	NO.	LGTH.	NO.	LGTH.	NO.	LGTH.	NO.	LGTH.	NO.	LGTH.	NO.	LGTH.	NO.	LGTH.	NO.	LGTH.	NO.	LGTH.	NO.	LGTH.	NO.	LGTH.	NO.	LGTH.	NO.	LGTH.	NO.	LGTH.	NO.	LGTH.	NO.	LGTH.	NO.	LGTH.	NO.	LGTH.	NO.	LGTH.	NO.	LGTH.	NO.	LGTH.	NO.	LGTH.	NO.	LGTH.	NO.	LGTH.	NO.	LGTH.	NO.	LGTH.	NO.	LGTH.	NO.	LGTH.	NO.	LGTH.	NO.	LGTH.	NO.	LGTH.	NO.	LGTH.	NO.	LGTH.	NO.	LGTH.	NO.	LGTH.	NO.	LGTH.	NO.	LGTH.	NO.	LGTH.	NO.	LGTH.	NO.	LGTH.	NO.	LGTH.	NO.	LGTH.	NO.	LGTH.	NO.	LGTH.	NO.	LGTH.	NO.	LGTH.	NO.	LGTH.	NO.	LGTH.	NO.	LGTH.	NO.	LGTH.	NO.	LGTH.	NO.	LGTH.	NO.	LGTH.	NO.	LGTH.	NO.	LGTH.	NO.	LGTH.	NO.	LGTH.	NO.	LGTH.	NO.	LGTH.	NO.	LGTH.	NO.	LGTH.	NO.	LGTH.	NO.	LGTH.	NO.	LGTH.	NO.	LGTH.	NO.	LGTH.	NO.	LGTH.	NO.	LGTH.	NO.	LGTH.	NO.	LGTH.	NO.	LGTH.	NO.	LGTH.	NO.	LGTH.	NO.	LGTH.	NO.	LGTH.	NO.	LGTH.	NO.	LGTH.	NO.	LGTH.	NO.	LGTH.	NO.	LGTH.	NO.	LGTH.	NO.	LGTH.	NO.	LGTH.	NO.	LGTH.	NO.	LGTH.	NO.	LGTH.	NO.	LGTH.	NO.	LGTH.	NO.	LGTH.	NO.	LGTH.	NO.	LGTH.	NO.	LGTH.	NO.	LGTH.	NO.	LGTH.	NO.	LGTH.	NO.	LGTH.	NO.	LGTH.	NO.	LGTH.	NO.	LGTH.	NO.	LGTH.	NO.	LGTH.	NO.	LGTH.	NO.	LGTH.	NO.	LGTH.	NO.	LGTH.	NO.	LGTH.	NO.	LGTH.	NO.	LGTH.	NO.	LGTH.	NO.	LGTH.	NO.	LGTH.	NO.	LGTH.	NO.	LGTH.	NO.	LGTH.	NO.	LGTH.	NO.	LGTH.	NO.	LGTH.	NO.	LGTH.	NO.	LGTH.	NO.	LGTH.	NO.	LGTH.	NO.	LGTH.	NO.	LGTH.	NO.	LGTH.	NO.	LGTH.	NO.	LGTH.	NO.	LGTH.	NO.	LGTH.	NO.	LGTH.	NO.	LGTH.	NO.	LGTH.	NO.	LGTH.	NO.	LGTH.	NO.	LGTH.	NO.	LGTH.	NO.	LGTH.	NO.	LGTH.	NO.	LGTH.	NO.	LGTH.	NO.	LGTH.	NO.	LGTH.	NO.	LGTH.	NO.	LGTH.	NO.	LGTH.	NO.	LGTH.	NO.	LGTH.	NO.	LGTH.	NO.	LGTH.	NO.	LGTH.	NO.	LGTH.	NO.	LGTH.	NO.	LGTH.	NO.	LGTH.	NO.	LGTH.	NO.	LGTH.	NO.	LGTH.	NO.	LGTH.	NO.	LGTH.	NO.	LGTH.	NO.	LGTH.	NO.	LGTH.	NO.	LGTH.	NO.	LGTH.	NO.	LGTH.	NO.	LGTH.	NO.	LGTH.	NO.	LGTH.	NO.	LGTH.	NO.	LGTH.	NO.	LGTH.	NO.	LGTH.	NO.	LGTH.	NO.	LGTH.	NO.	LGTH.	NO.	LGTH.	NO.	LGTH.	NO.	LGTH.	NO.	LGTH.	NO.	LGTH.	NO.	LGTH.	NO.	LGTH.	NO.	LGTH.	NO.	LGTH.	NO.	LGTH.	NO.	LGTH.	NO.	LGTH.	NO.	LGTH.	NO.	LGTH.	NO.	LGTH.	NO.	LGTH.	NO.	LGTH.	NO.	LGTH.	NO.	LGTH.	NO.	LGTH.	NO.	LGTH.	NO.	LGTH.	NO.	LGTH.	NO.	LGTH.	NO.	LGTH.	NO.	LGTH.	NO.	LGTH.	NO.	LGTH.	NO.	LGTH.	NO.	LGTH.	NO.	LGTH.	NO.	LGTH.	NO.	LGTH.	NO.	LGTH.	NO.	LGTH.	NO.	LGTH.	NO.	LGTH.	NO.	LGTH.	NO.	LGTH.	NO.	LGTH.	NO.	LGTH.	NO.	LGTH.	NO.	LGTH.	NO.	LGTH.	NO.	LGTH.	NO.	LGTH.	NO.	LGTH.	NO.	LGTH.	NO.	LGTH.	NO.	LGTH.	NO.	LGTH.	NO.	LGTH.	NO.	LGTH.	NO.	LGTH.	NO.	LGTH.	NO.	LGTH.	NO.	LGTH.	NO.	LGTH.	NO.	LGTH.	NO.	LGTH.	NO.	LGTH.	NO.	LGTH.	NO.	LGTH.	NO.	LGTH.	NO.	LGTH.	NO.	LGTH.	NO.	LGTH.	NO.	LGTH.	NO.	LGTH.	NO.	LGTH.	NO.	LGTH.	NO.	LGTH.	NO.	LGTH.	NO.	LGTH.	NO.	LGTH.	NO.	LGTH.	NO.	LGTH.	NO.	LGTH.	NO.	LGTH.	NO.	LGTH.	NO.	LGTH.	NO.	LGTH.	NO.	LGTH.	NO.	LGTH.	NO.	LGTH.	NO.	LGTH.	NO.	LGTH.	NO.	LGTH.	NO.	LGTH.	NO.	LGTH.	NO.	LGTH.	NO.	LGTH.	NO.	LGTH.	NO.	LGTH.	NO.	LGTH.	NO.	LGTH.	NO.	LGTH.	NO.	LGTH.	NO.	LGTH.	NO.	LGTH.	NO.	LGTH.	NO.	LGTH.	NO.	LGTH.	NO.	LGTH.	NO.	LGTH.	NO.	LGTH.	NO.	LGTH.	NO.	LGTH.	NO.	LGTH.	NO.	LGTH.	NO.	LGTH.	NO.	LGTH.	NO.	LGTH.	NO.	LGTH.	NO.	LGTH.	NO.	LGTH.	NO.	LGTH.	NO.	LGTH.	NO.	LGTH.	NO.	LGTH.	NO.	LGTH.	NO.	LGTH.	NO.	LGTH.	NO.	LGTH.	NO.	LGTH.	NO.	LGTH.	NO.	LGTH.	NO.	LGTH.	NO.	LGTH.	NO.	LGTH.	NO.	LGTH.	NO.	LGTH.	NO.	LGTH.	NO.	LGTH.	NO.	LGTH.	NO.	LGTH.	NO.	LGTH.	NO.	LGTH.	NO.	LGTH.	NO.	LGTH.	NO.	LGTH.	NO.	LGTH.	NO.	LGTH.	NO.	LGTH.	NO.	LGTH.	NO.	LGTH.	NO.	LGTH.	NO.	LGTH.	NO.	LGTH.	NO.	LGTH.	NO.	LGTH.	NO.	LGTH.	NO.	LGTH.	NO.	LGTH.	NO.	LGTH.	NO.	LGTH.	NO.	LGTH.	NO.	LGTH.	NO.	LGTH.	NO.	LGTH.	NO.	LGTH.	NO.	LGTH.	NO.	LGTH.	NO.	LGTH.	NO.	LGTH.	NO.	LGTH.	NO.	LGTH.	NO.	LGTH.	NO.	LGTH.	NO.	LGTH.	NO.	LGTH.	NO.	LGTH.	NO.	LGTH.	NO.	LGTH.	NO.	LGTH.	NO.	LGTH.	NO.	LGTH.	NO.	LGTH.	NO.	LGTH.	NO.	LGTH.	NO.	LGTH.	NO.	LGTH.	NO.	LGTH.	NO.	LGTH.	NO.	LGTH.	NO.	LGTH.	NO.	LGTH.	NO.	LGTH.	NO.	LGTH.	NO.	LGTH.	NO.	LGTH.	NO.	LGTH.	NO.	LGTH.	NO.	LGTH.	NO.	LGTH.	NO.	LGTH.	NO.	LGTH.	NO.	LGTH.	NO.	LGTH.	NO.	LGTH.	NO.	LGTH.	NO.	LGTH.	NO.	LGTH.	NO.	LGTH.	NO.	LGTH.	NO.	LGTH.	NO.	LGTH.	NO.	LGTH.	NO.	LGTH.	NO.	LGTH.	NO.	LGTH.	NO.	LGTH.	NO.	LGTH.	NO.	LGTH.	NO.	LGTH.	NO.	LGTH.	NO.	LGTH.	NO.	LGTH.	NO.	LGTH.	NO.	LGTH.	NO.	LGTH.	NO.	LGTH.	NO

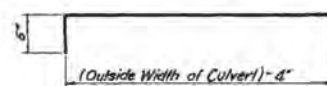


GENERAL NOTES:

Construction Specifications: Latest Approved La. Dept. of
Highways Standard Specifications.
Design Specifications: AASHTO 1961 as Amended by Int. Spec. 1966
Live Load: HS 20-44, or Military Loading, Whichever is Greater.
All Concrete to be Class "A".
All Exposed Corners to Have $3/4"$ Chamfer, Unless Other-
wise Noted.
Reinforcement Shall Be Billet-Steel A.S.T.M.
A615 or Rail-Steel A.S.T.M. A616 or
Axle-Steel A.S.T.M. A 617.
Dimensions Relating to Reinforcing Steel Are To Bar
Centers.
A 1'-6" Square of Plastic Filter Cloth (See Qualified
Products List) shall be placed in contact with
Concrete behind each Weep Hole, in addition to
approx. 2 Cu. Ft. of Concrete Sand.
For Detail of Joints, See Std. Plan C.M.-49.

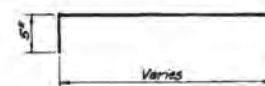
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① Includes 1-1'-6" Lap Splice



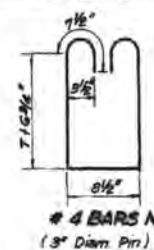
BARS A

(3 3/4" Diam. Pin - #5 Bars)
(4 1/2" Diam. Pin - #6 Bars)

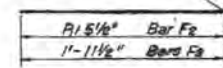


BARS A

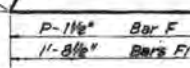
(3 1/4" Diarn. Pin - #5 Bars)
(4 1/2" Diarn. Pin - #6 Bars)



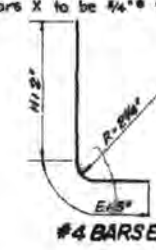
4 BARS M
(3" Diam. Pin)



#4 BARS F_y & F_u
(3" Diam. Pin)



4 BARS F# F#
(3" Diam Pin)



#4 BARSE

(A) *a Bars X to be $\frac{1}{4}$ " Smooth and Greased for 1'-0" of Length

[illegible]

STANDARD PLAN

RETAIN CONCRETE BOX CULVERTS

STRAIGHT WINGS 60° CROSSING

2:1 SPILL SLOPE NORMAL TO CHANNEL

5' TYPICAL SPANS 6' TYPICAL SPANS

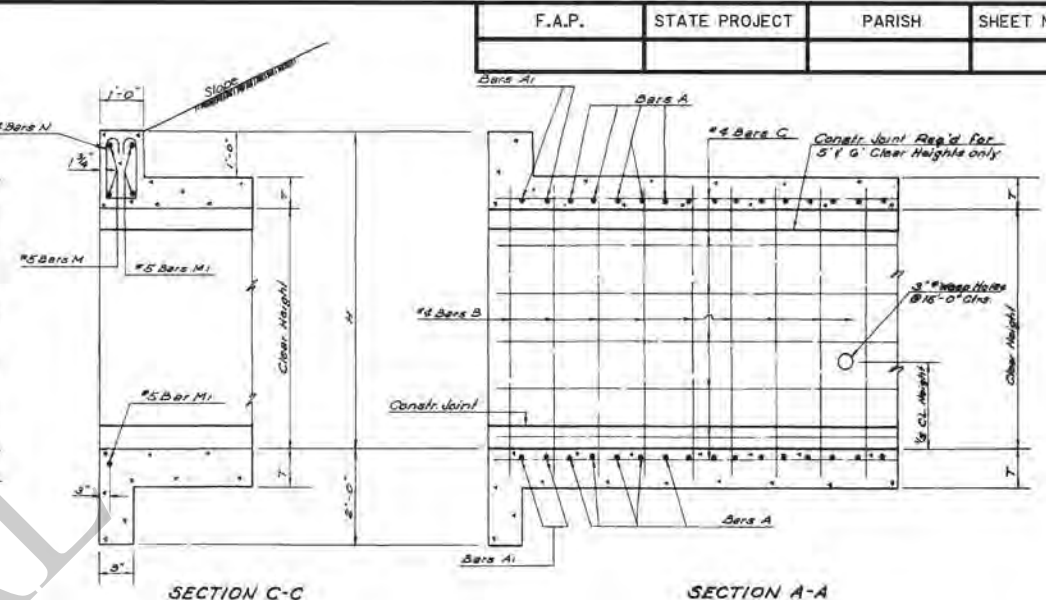
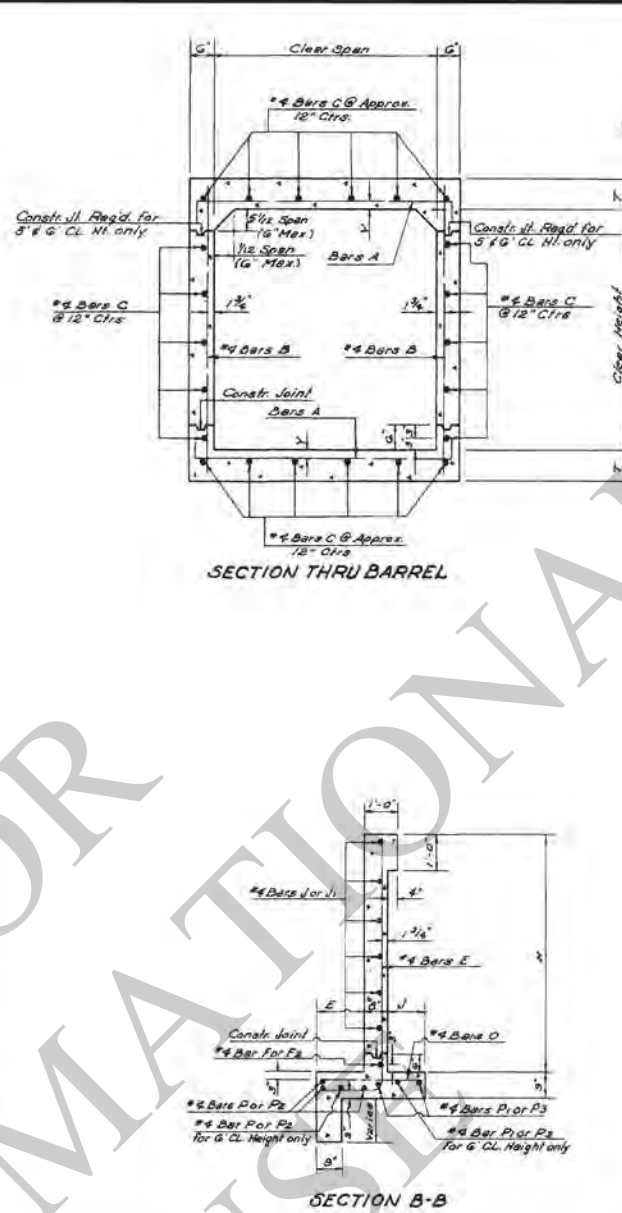
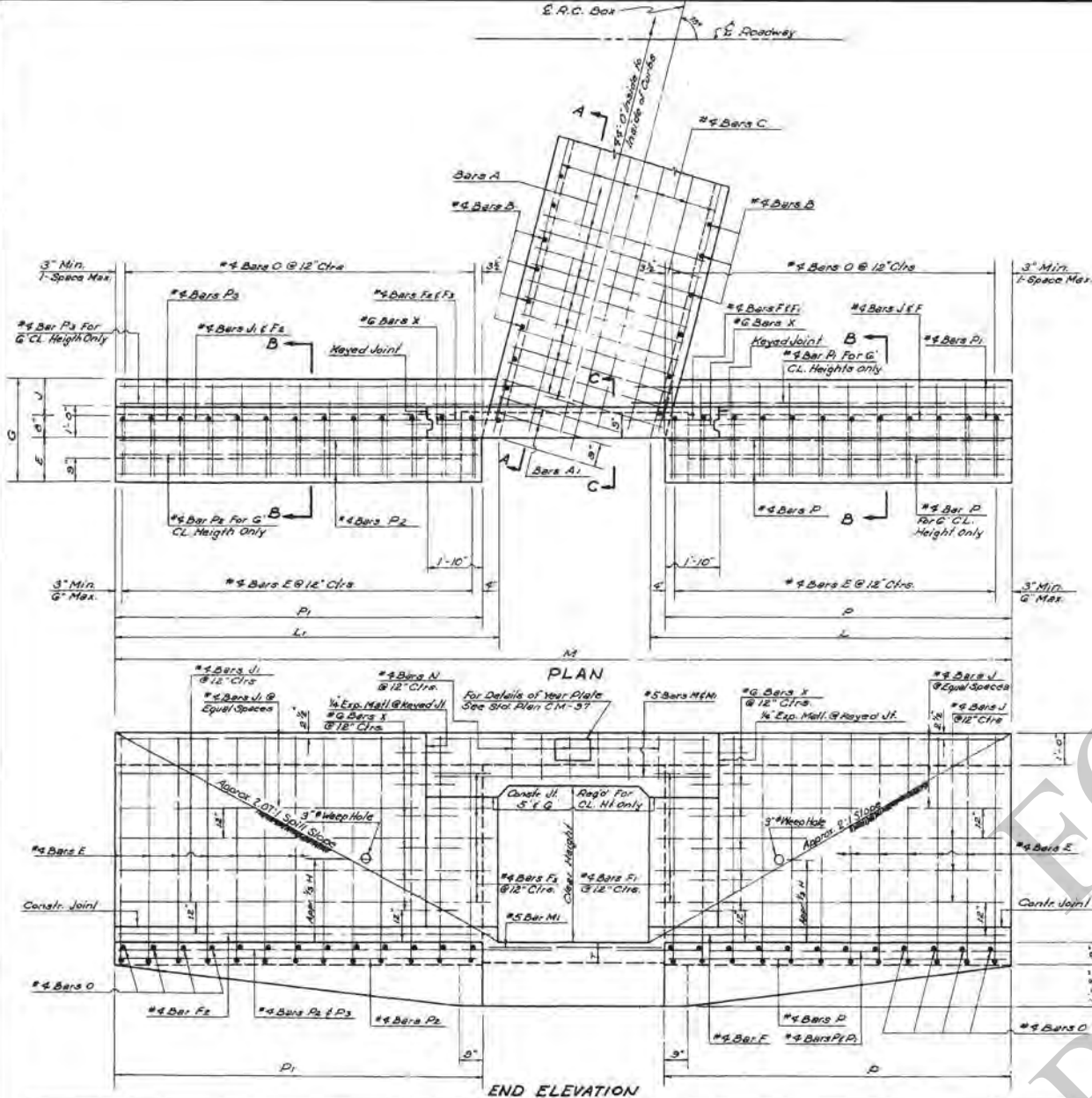
Supers. 01/11 1962

STATE OF LOUISIANA

DEPARTMENT OF HIGHWAYS

DESIGNED BY <u>W. H. HAY</u>	CHECKED BY <u>J. H. ALLEN</u>	IN CHARGE OF <u>W. C. ANDERSON</u>
DRAWN BY <u>W. H. HAY</u>	CHECKED BY <u>W. H. HAY</u>	CHECKED BY <u>W. H. HAY</u>
IN CHARGE OF		

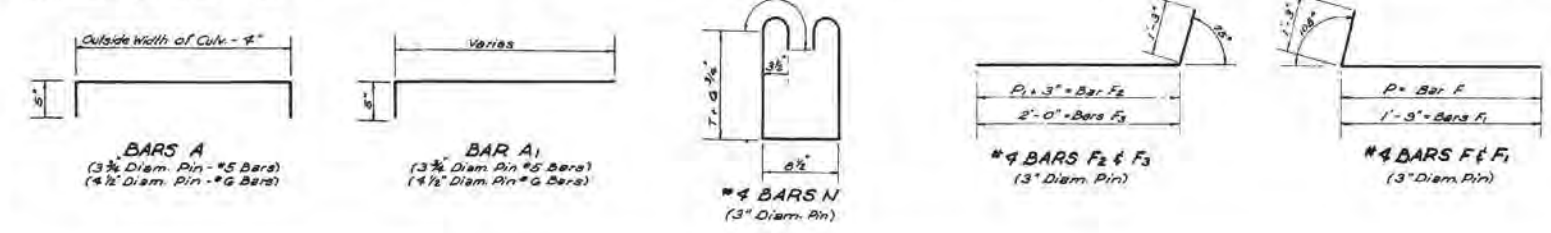
1-11-78
DATE
C.C.S.S. 4-7-R.S. 60°.1
CHIEF ENGINEER



GENERAL NOTES:
Construction Specifications: Latest Approved L.S. Dept. of Highways.
Standard Specifications.
Design Specifications: A.A.S.H.O. 1961 as amended by Int. Spec. 1966
Live Load HS 20-44 or Military Loading, Whichever is Greater.
All Concrete to be Class "A".
All Exposed Corners to have 1/4" Chamfer, Unless Otherwise noted.
Reinforcement Shall be Billet-Steel A.S.T.M. A615 or Rail-Steel
A.S.T.M. A616 or Axle-Steel A.S.T.M. A617.
Dimensions relating to Reinforcing Steel are to Bar Centers.
A 1'-6" Square of Plastic Filter Cloth (See Qualified Products
List) shall be placed in contact with Concrete behind each
Weep Hole, in addition to approx. 2 Cu. Ft. of Concrete Sand.
For Detail of Joints, See Std. Plan C.M.-49.

DIMENSIONS															BILL OF REINFORCING STEEL FOR 4'-0" CULVERT																																QUANTITIES				OPENING																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																										
OPENING		MAX FILL	BARREL	WING AND CURBS												BARREL REINFORCEMENT																WING AND CURB REINFORCEMENT																PER LINEAR FT OF BARREL		4'-0" CULVERT																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																											
CLEAR SPAN	CLEAR WEIR	AREA	SLAB	WALL	T	Y	E	J	G	H	L	L	P	P	M	BARS A				BARS A				4" BARS B				4" BARS C				4" BARS E				4" BARS F				4" BARS F				4" BARS F				4" BARS F				4" BARS J				4" BARS J				4" BARS N				4" BARS O				4" BARS P				4" BARS P				4" BARS P				4" BARS P				4" BARS M				4" BARS M				4" BARS X				STEEL	CONC.	STEEL	CONC.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																										
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Includes One 1'-6" Lap Splice.



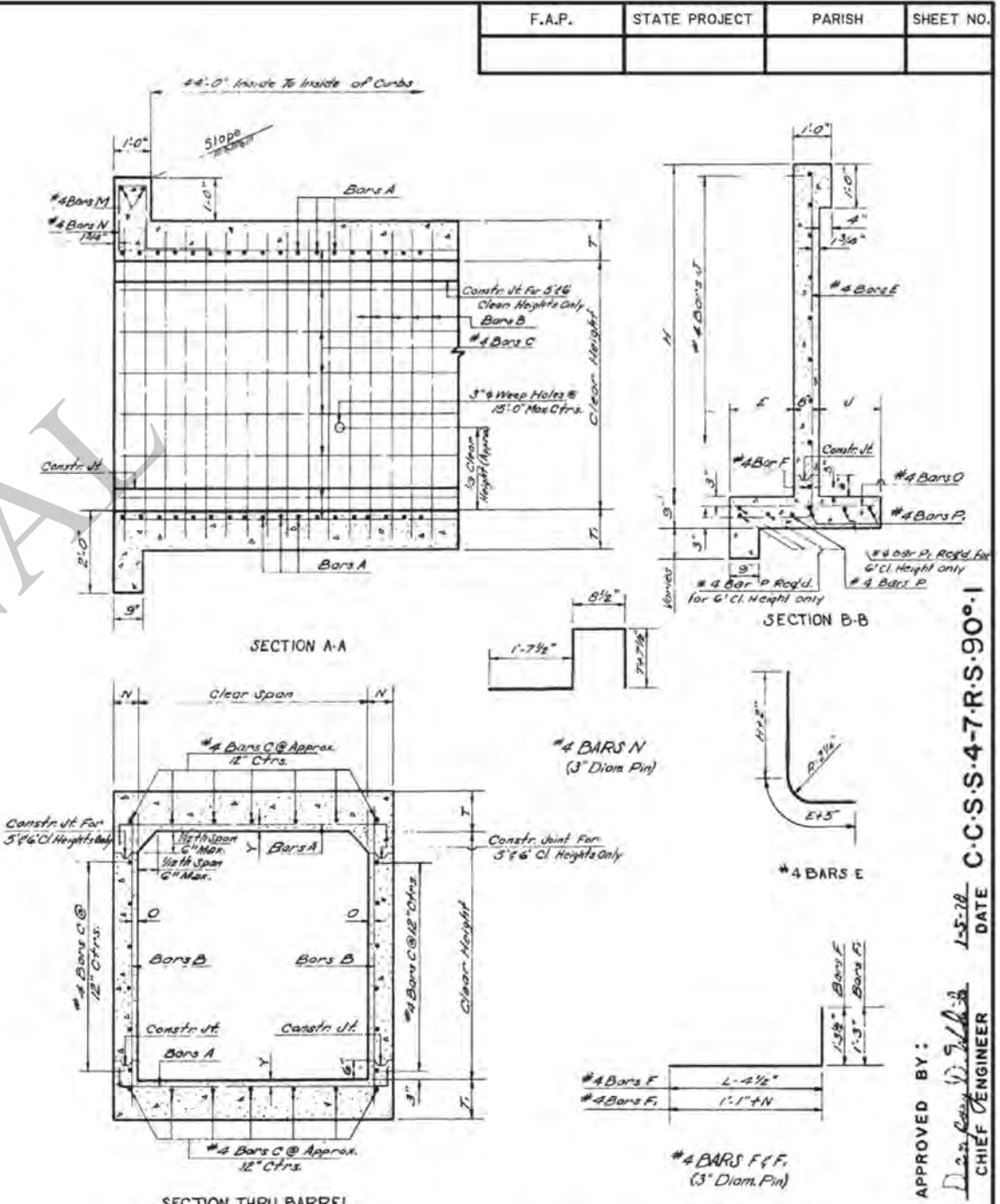
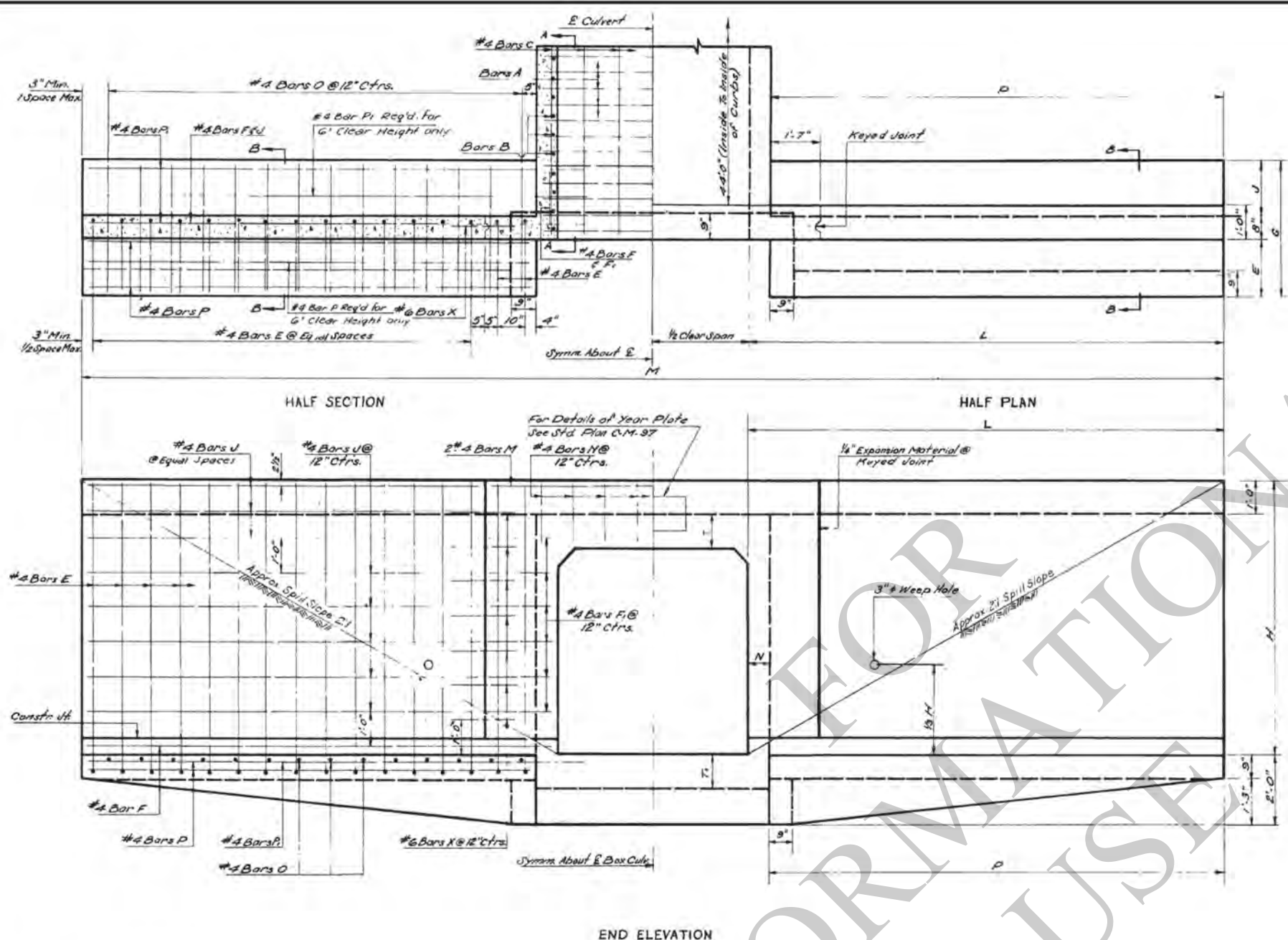
APPROVED BY:
Danney D. White
CHIEF ENGINEER
1-11-78
DATE

1-11-78 Rev. Weep Hole Note			W.T.L.
6-10-78 Rev. Slope Intersect			W.T.L.
6-8-78 Rev. General Notes for Sheet			W.T.L.
4-27-81 Added Aile Steel			W.T.L.
12-14-84 Rev. #4 Bars to Military			W.T.L.
Loading & Protection of Slopes			W.T.L.
DATE	DESCRIPTION	BY	
STATE OF LOUISIANA DEPARTMENT OF HIGHWAYS			
DESIGNED	W. E. M.	DETAILED	E. J. Marfel
CHECKED	N. K. B.	CHECKED	W. E. Marzoum
IN CHARGE OF		TRACED	K. MICHAIL
		CHECKED	W. E. Marzoum

STANDARD PLAN
REINFORCED CONCRETE BOX CULVERT
STRAIGHT WINGS 75° CROSSING
2:1 SPILL SLOPE NORMAL TO CHANNEL
4' THRU 7' SPANS 3' THRU 6' HEIGHTS

DATED Sept. 28, 1964

STATE OF LOUISIANA
DEPARTMENT OF HIGHWAYS



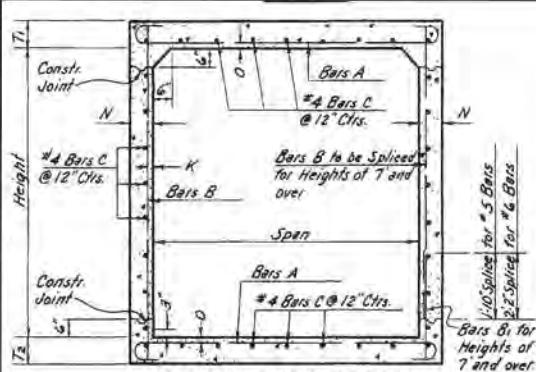
DIMENSIONS															BILL OF REINFORCING STEEL FOR 44'0" CULVERT																				QUANTITIES				OPENINGS																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																									
OPENINGS		MAX. FILL	BARREL			WINGS & CURBS								BARREL REINFORCEMENT					WING & CURB REINFORCEMENT															PER LIN. FT. OF BARREL		44'0" CULVERT		CLEAR SPAN	CLEAR HEIGHT																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																									
CLEAR SPAN	CLEAR HEIGHT	AREA	SLAB	WALL	N	T	T ₁	O	Y	E	U	G	H	L	P	M	BARS A		BARS B		#4 BARS C		#4 BARS E		#4 BARS F		#4 BARS G		#4 BARS H		#4 BARS I		#4 BARS J		#4 BARS K		STEEL	CONC.	STEEL	CONC.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																								
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*Includes One 1'-6" Lap Splice

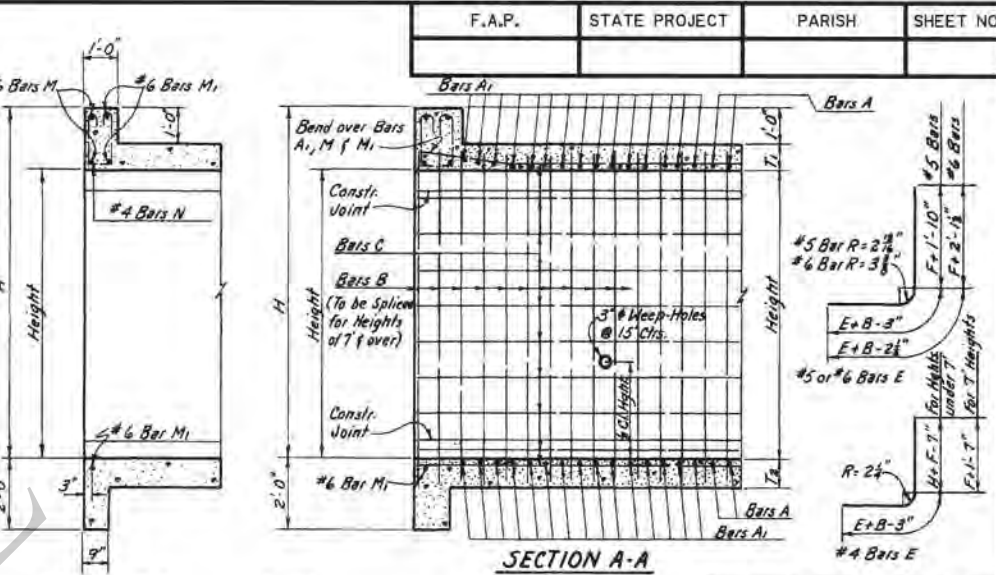
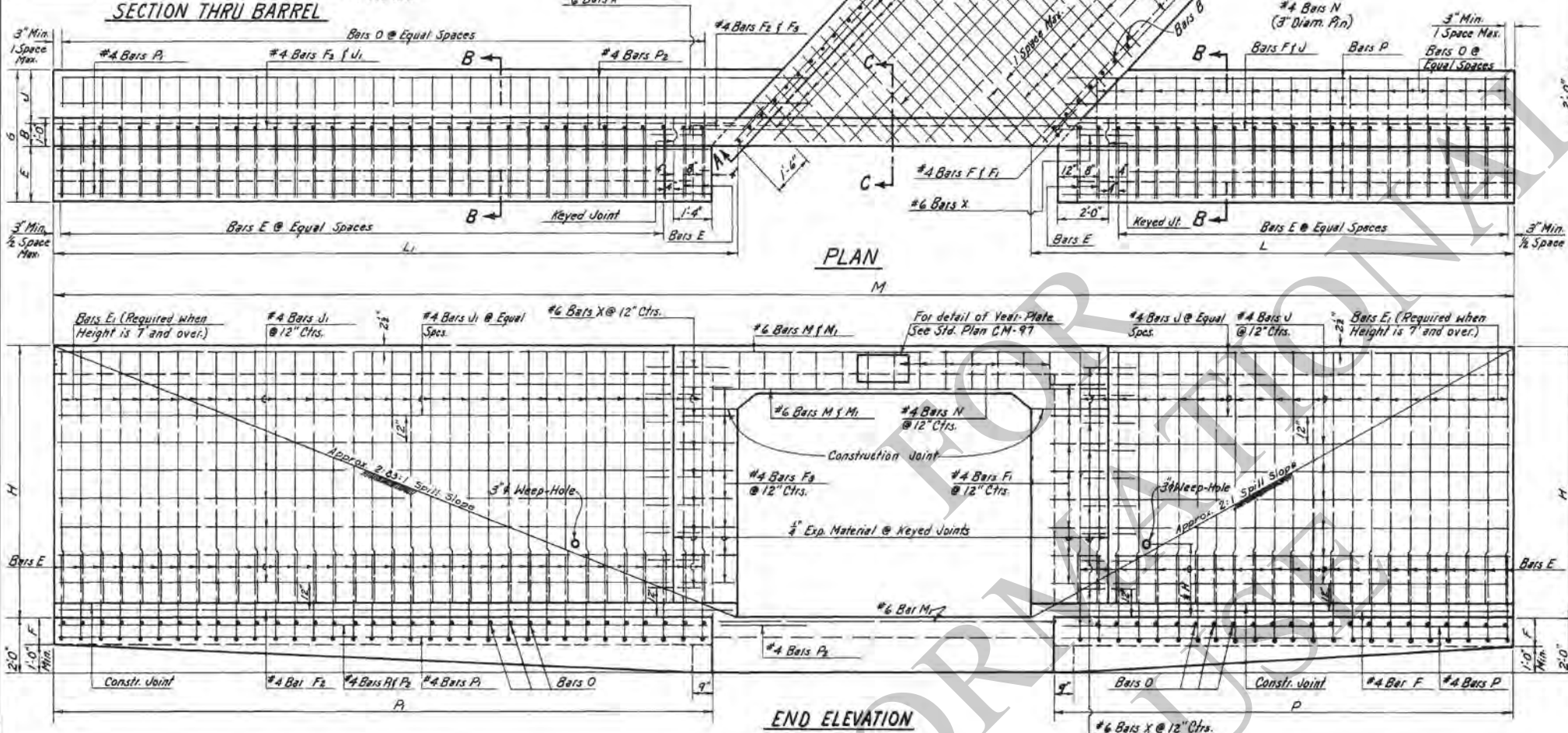
GENERAL NOTES:
Construction Specifications: Latest Approved L.S. Dept. of Highways Standard Specifications.
Design Specifications: A.A.S.H.O. 1961 As Amended by Int. Spec. 1964, Live Load HS 20-44 or Military Load, whichever is greater.
All Concrete to be Class "A".
All Exposed Corners to Have 3/4" Chamfer, Unless Otherwise noted.
Reinforcement Bars shall be Direct Steel ASTM A 615 or E81 Steel ASTM A 615 or E81 Steel ASTM A 615 or E81 Steel.
Dimensions Relating to Reinforcing Steel are to bar centers.
A 1"-6" Square of Plastic Filter Cloth (See Qualified Products List) shall be placed in contact with concrete behind each Weep Hole, in addition to approx. 2 Cu. Ft. of Concrete Sand.
For Detail of Joints, See Std. Plan C.M.-49.

REINFORCING STEEL		QUANTITIES		OPENINGS	
DATE	DESCRIPTION	STEEL	CONC.	CLEAR SPAN	CLEAR HEIGHT
12-14-58	Rev. 1: 1'-6" Spans to 1'-11" Spans	2634	23.08	4	3
1-9-64	Revised 3' Span	2938	27.86	4	4
7-27-62	Revised 4' Span	3274	26.34	5	3
1-1-62	Revised 5' Span	3575	31.12	5	4
1-1-62	Revised 6' Span	3912	36.58	6	3
1-1-62	Revised 7' Span	4352	41.10	6	4
1-1-62	Revised 8' Span	4887	47.45	6	5
1-1-62	Revised 9' Span	5501	51.18	7	3
1-1-62	Revised 10' Span	6019	56.48	7	4
1-1-62	Revised 11' Span	6537	61.76	7	5
1-1-62	Revised 12' Span	7055	67.04	8	3
1-1-62	Revised 13' Span	7573	72.32	8	4
1-1-62	Revised 14' Span	8091	77.60	8	5
1-1-62	Revised 15' Span	8609	82.88	9	3
1-1-62	Revised 16' Span	9127	88.16	9	4
1-1-62	Revised 17' Span	9645	93.44	9	5
1-1-62	Revised 18' Span	10163	98.72	10	3
1-1-62	Revised 19' Span	10681	104.00	10	4
1-1-62	Revised 20' Span	11199	109.28	10	5

APPROVED BY:
DATE: 1-5-18
CHIEF ENGINEER



GENERAL NOTES
Construction Specifications: Latest approved La Dept of Highways
Standard Specifications.
Design Specifications: A.A.S.H.O. 1961 as amended by Int Spec 1966.
Live Load: HS 20-44 or Military; whichever is Greater.
All Concrete to be Class A.
All exposed corners to have 1/4 chamfer, unless otherwise noted.
Reinforcement shall be Billet-Steel A.S.T.M. A615 or Rail-Steel A.S.T.M. A616 or Axle-Steel A.S.T.M. A617.
Dimensions relating to Reinforcing Steel are to bar centers.
A 1" x 6" Square of Plastic Filter Cloth (See Qualified Products List) shall be placed in contact with Concrete behind each Weep Hole, in addition to approx. 2 Cu. Ft. of Concrete Sand.
For details of joints, see Std. Plan CM-49.



F.A.P.		STATE PROJECT		PARISH		SHEET NO.	
OPENING		BARREL		WINGS AND CURBS		DIMENSIONS - BARS A AND A1	
Span in Feet		Height in Feet		T1 T2 N O K B E U G F H L Li P Pi M		Size R S	
				STEEL CONCRETE STEEL CONCRETE			
				Lbs. Cu. Yds. Lbs. Cu. Yds.			
7		4		9 9 6 12 1/2 3 1-3 0-10 2-9 9 5-9 10-6 14-10 8-10 14-2 35-3 30.12 0.6019 50.84 41.94		#6 5 1/2 0'-11"	
		5		9 9 6 12 1/2 3 1-5 1-2 3-3 9 6-9 12-6 17-6 11-10 17-0 40 1/2 90.79 0.6309 54.00 40.32		#7 6 8 1'-1"	
		6		9 9 6 12 1/2 3 1-7 1-7 3-10 9 7-9 14-6 20-6 13-10 19-11 45 3/4 95.30 0.6759 60.72 35.60			
		7		9 9 7 12 1/2 3 1-8 1-8 4-5 12 8-9 16-6 23-6 15-11 22-9 50 2/3 107.29 0.7654 72.68 47.84			
8		4		10 10 6 12 1/2 3 1-3 0-10 2-9 9 5-10 10-6 14-10 8-10 14-2 36 3/4 96.88 0.7130 55.68 47.39			
		5		10 10 6 12 1/2 3 1-5 1-2 3-3 9 6-10 12-6 17-6 11-10 17-2 41 3/4 98.56 0.7500 59.62 53.88			
		6		10 10 7 12 1/2 3 1-7 1-7 3-10 9 7-10 14-6 21-6 13-10 20-3 46 1/4 103.44 0.8344 65.88 63.56			
		7		10 10 7 12 1/2 3 1-8 1-8 4-5 12 8-10 16-6 23-6 15-11 22-9 51 3/4 116.16 0.8778 77.32 78.44			
		8		10 10 8 12 1/2 3 1-9 1-9 5-10 12 9-10 18-6 26-6 17-5 25-9 56 3/4 121.82 0.9805 85.20 81.40			
9		5		10 10 7 12 1/2 3 1-5 1-2 3-3 9 6-10 12-7 17-11 11-10 17-2 43 3/4 122.30 0.8843 70.43 80.43			
		6		10 10 7 12 1/2 3 1-7 1-7 3-10 9 7-10 14-6 21-6 13-10 20-3 48 3/4 124.97 0.9275 76.11 88.15			
		7		10 10 8 12 1/2 3 1-8 1-8 4-5 12 8-10 16-6 23-6 15-11 22-9 53 3/4 138.87 1.0247 88.15 85.62			
		8		10 10 8 12 1/2 3 1-9 1-9 5-10 12 9-10 18-6 26-6 17-5 25-9 57 3/4 143.40 1.0741 95.43 86.06			
		9		10 10 9 12 1/2 3 1-10 1-10 6-11 12 10-10 20-6 28-6 19-3 28-0 62 1/2 150.80 1.1888 108.98 110.31			
10		5		11 11 8 12 1/2 3 1-5 1-2 3-3 9 6-11 12-9 18-11 11-10 17-2 45 3/4 133.28 1.0257 76.02 67.80			
		6		11 11 8 12 1/2 3 1-7 1-6 3-9 9 7-11 14-9 21-11 13-10 20-3 50 1/2 135.95 1.0781 81.68 75.22			
		7		11 11 8 12 1/2 3 1-8 1-8 4-5 12 8-11 16-10 23-11 15-11 22-10 54 3/4 145.08 1.1245 91.59 90.62			
		8		11 11 9 12 1/2 3 1-9 1-9 5-10 12 9-11 18-11 26-11 16-2 25-9 60 3/4 153.61 1.2346 101.26 104.63			
		9		11 11 9 12 1/2 3 1-10 1-10 6-11 12 10-11 20-11 28-11 17-2 28-0 64 3/4 163.80 1.2901 115.48 116.67			
		10		11 11 10 12 1/2 3 1-11 1-11 7-12 12 11-11 22-11 32-11 18-3 31-0 69 3/4 175.06 1.4187 129.58 132.67			

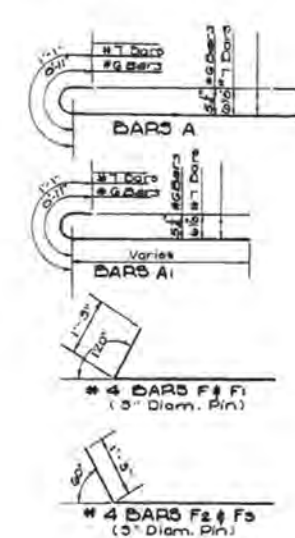
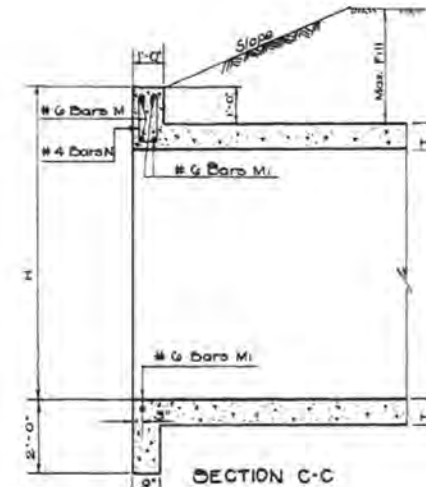
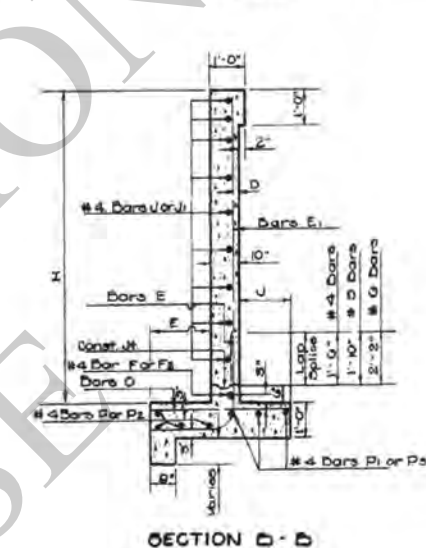
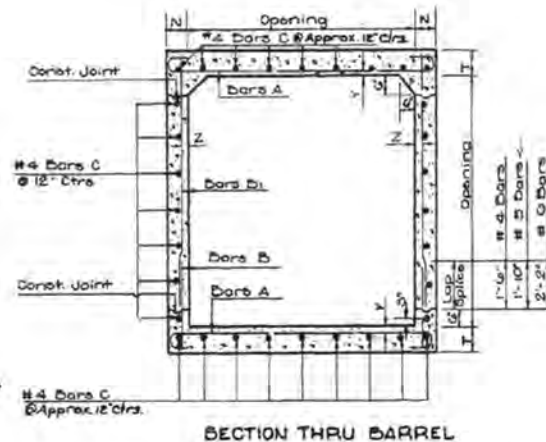
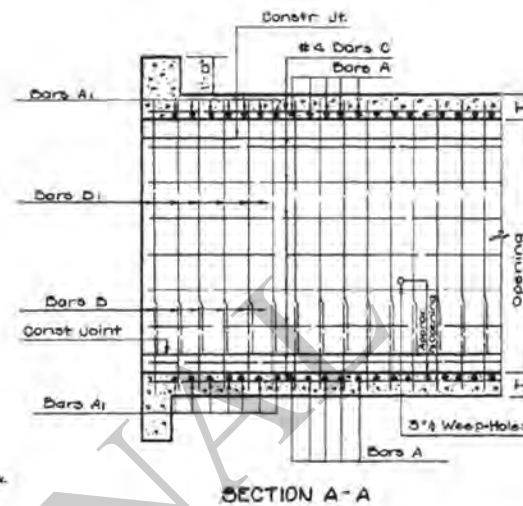
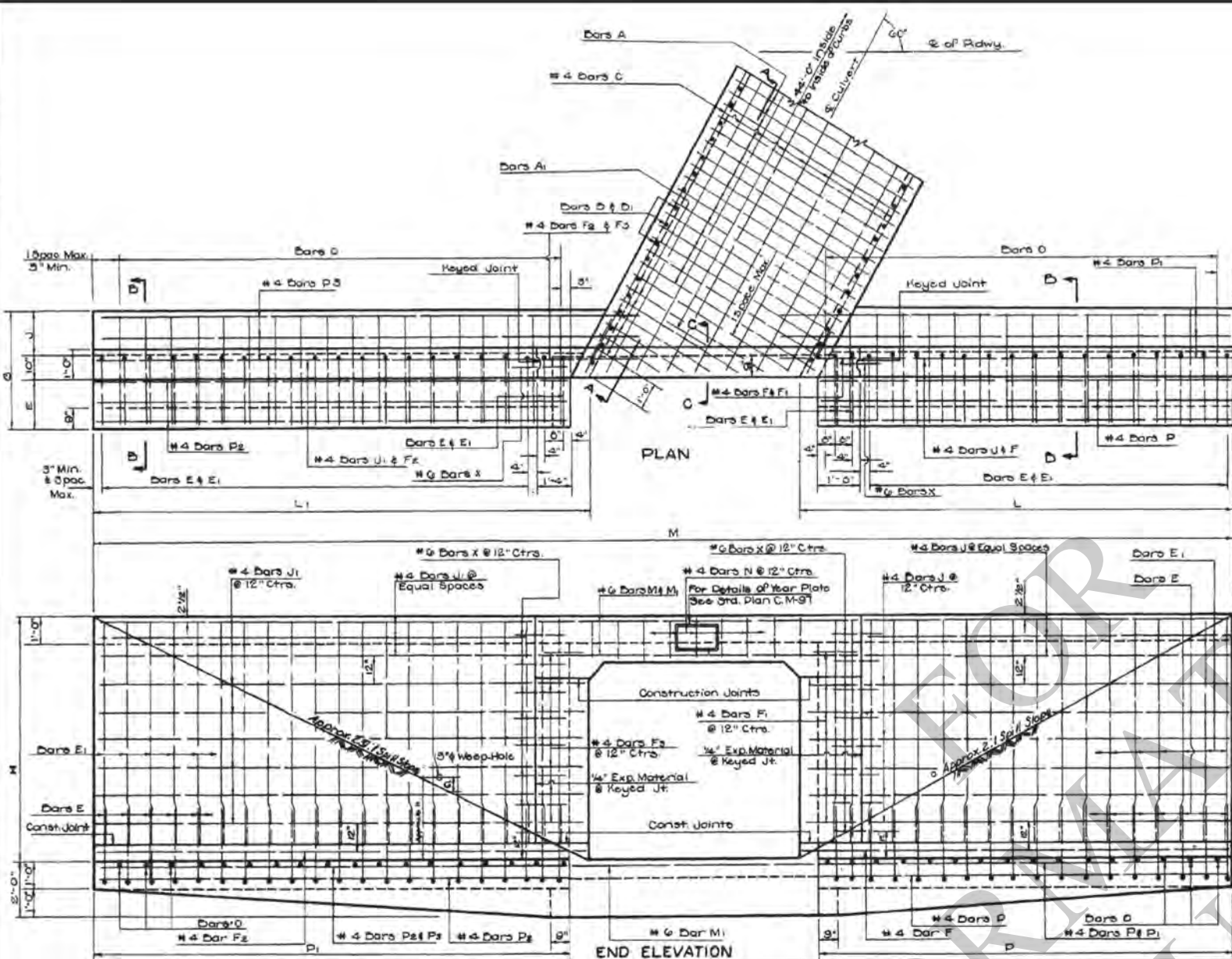
OPENING		BARREL REINFORCEMENT		CURB AND WING REINFORCEMENT	
Span in Feet		Height in Feet		T1 T2 N O K B E U G F H L Li P Pi M	
				STEEL CONCRETE STEEL CONCRETE	
				Lbs. Cu. Yds. Lbs. Cu. Yds.	
7		4		9 9 6 12 1/2 3 1-3 0-10 2-9 9 5-9 10-6 14-10 8-10 14-2 35-3 30.12 0.6019 50.84 41.94	
		5		9 9 6 12 1/2 3 1-5 1-2 3-3 9 6-9 12-6 17-6 11-10 17-0 40 1/2 90.79 0.6309 54.00 40.32	
		6		9 9 6 12 1/2 3 1-7 1-7 3-10 9 7-9 14-6 20-6 13-10 19-11 45 3/4 95.30 0.6759 60.72 35.60	
		7		9 9 7 12 1/2 3 1-8 1-8 4-5 12 8-9 16-6 23-6 15-11 22-9 50 2/3 107.29 0.7654 72.68 47.84	
8		4		10 10 6 12 1/2 3 1-3 0-10 2-9 9 5-10 10-6 14-10 8-10 14-2 36 3/4 96.88 0.7130 55.68 47.39	
		5		10 10 6 12 1/2 3 1-5 1-2 3-3 9 6-10 12-6 17-6 11-10 17-2 41 3/4 98.56 0.7500 59.62 53.88	
		6		10 10 7 12 1/2 3 1-7 1-7 3-10 9 7-10 14-6 21-6 13-10 20-3 46 1/4 103.44 0.8344 65.88 63.56	
		7		10 10 7 12 1/2 3 1-8 1-8 4-5 12 8-10 16-6 23-6 15-11 22-9 51 3/4 116.16 0.8778 77.32 78.44	
		8		10 10 8 12 1/2 3 1-9 1-9 5-10 12 9-10 18-6 26-6 17-5 25-9 56 3/4 121.82 0.9805 85.20 81.40	
9		5		10 10 7 12 1/2 3 1-5 1-2 3-3 9 6-10 12-7 17-11 11-10 17-2 43 3/4 122.30 0.8843 70.43 80.43	
		6		10 10 7 12 1/2 3 1-7 1-7 3-10 9 7-10 14-6 21-6 13-10 20-3 48 3/4 124.97 0.9275 76.11 88.15	
		7		10 10 8 12 1/2 3 1-8 1-8 4-5 12 8-10 16-6 23-6 15-11 22-9 53 3/4 138.87 1.0247 88.15 85.62	
		8		10 10 8 12 1/2 3 1-9 1-9 5-10 12 9-10 18-6 26-6 17-5 25-9 57 3/4 143.40 1.0741 95.43 86.06	
		9		10 10 9 12 1/2 3 1-10 1-10 6-11 12 10-10 20-6 28-6 19-3 28-0 62 1/2 150.80 1.1888 108.98 110.31	
10		5		11 11 8 12 1/2 3 1-5 1-2 3-3 9 6-11 12-9 18-11 11-10 17-2 45 3/4 133.28 1.0257 76.02 67.80	
		6		11 11 8 12 1/2 3 1-7 1-6 3-9 9 7-11 14-9 21-11 13-10 20-3 50 1/2 135.95 1.0781 81.68 75.22	
		7		11 11 8 12 1/2 3 1-8 1-8 4-5 12 8-11 16-10 23-11 15-11 22-10 54 3/4 145.08 1.1245 91.59 90.62	
		8		11 11 9 12 1/2 3 1-9 1-9 5-10 12 9-11 18-11 26-11 16-2 25-9 60 3/4 153.61 1.2346 101.26 104.63	
		9		11 11 9 12 1/2 3 1-10 1-10 6-11 12 10-11 20-11 28-11 17-2 28-0 64 3/4 163.80 1.2901 115.48 116.67	
		10		11 11 10 12 1/2 3 1-11 1-11 7-12 12 11-11 22-11 32-11 18-3 31-0 69 3/4 175.06 1.4187 129.58 132.67	

APPROVED BY: *Donny D. R. R.* 1-11-78
CHIEF ENGINEER DATE

MAXIMUM FILL

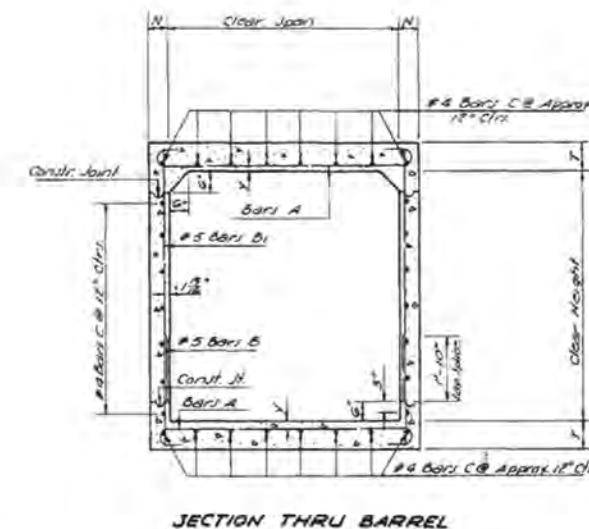
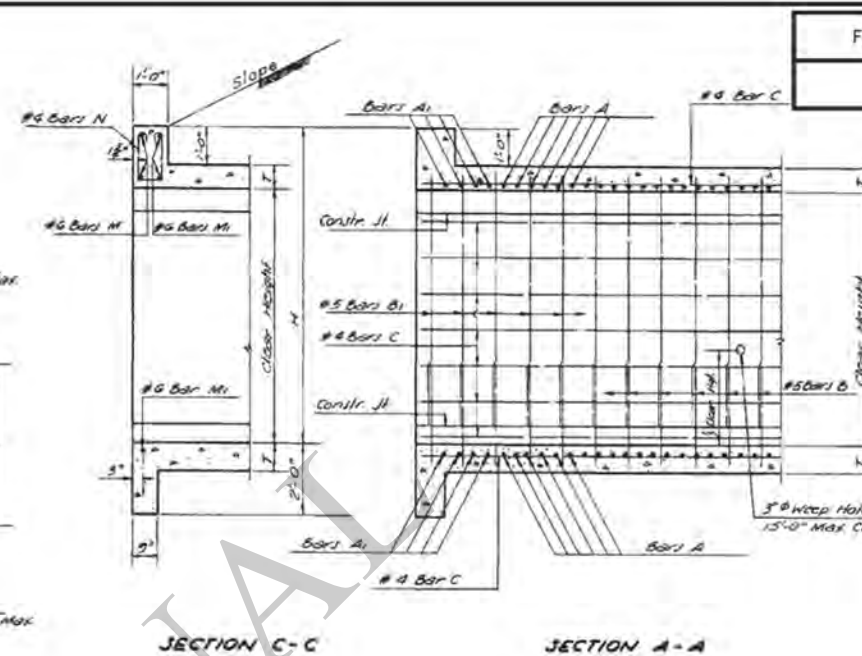
Span in Feet	Height in Feet	Area Sq. Ft.	Slab	Wall	Span in Feet	Height in Feet	Area Sq. Ft.	Slab	Wall
4	20	15	12		5	45	12	8	
5	35	14	6		6	54	12	5	
6	42	14	5		7	63	11	8	
7	49	13	6		8	72	11	5	
8	56	14	11		9	81	10	5	
9	63	13	6		10	90	6	11	
10	70	13	6		11	99	6	6	
11	77	12	5		12	108	6	6	
13	99	10	6		14	117	6	6	
15	121	8	6		16	126	6	6	
17	143	6	6		18	135	6	6	
19	165	5	6		20	144	6	6	
21	187	4	6		22	153	6	6	
23	209	3	6		24	162	6	6	
25	231	2	6		26	171	6	6	
27	253	1	6		28	180	6	6	
29	275	1	6		30	189	6	6	
31	297	1	6		32	198	6	6	
33	319	1	6		34	207	6	6	
35	341	1	6		36	216	6	6	
37	363	1	6		38	225	6	6	
39	385	1	6		40	234	6	6	
41	407	1	6		42	243	6	6	
43	429	1	6		44	252	6	6	
45	451	1	6		46	261	6	6	
47	473	1	6		48	270	6	6	
49	495	1	6		50	279	6	6	
51	517	1	6		52	288	6	6	
53	539	1	6		54	297	6	6	
55	561	1	6		56	306	6	6	
57	583	1	6		58	315	6	6	
59	605	1	6		60	324	6	6	
61	627	1	6		62	333	6	6	
63	649	1	6		64	342	6	6	
65	671	1	6		66	351	6	6	
67	693	1	6		68	360	6	6	
69	715	1	6		70	369	6	6	
71	737	1	6		72	378	6	6	
73	759	1	6		74	387	6	6	
75	781	1	6		76	396	6	6	
77	803	1	6		78	405	6	6	
79	825	1	6		80	414	6	6	
81	847	1	6		82	423	6	6	
83	869	1	6		84	432	6	6	
85	891	1	6		86	441	6	6	
87	913	1	6		88	450	6	6	
89	935	1	6		90	459	6	6	
91	957	1	6		92	468	6	6	
93	979	1	6		94	477	6	6	
95	1001	1	6		96	486	6	6	
97	1023	1	6		98	495	6	6	
99	1045	1	6		100	504	6	6	

REINFORCEMENT BOX CULVERTS
STRAIGHT WINGWALLS
45° CROSSING



OPENINGS		BARREL REINFORCEMENT												WINGS AND CURBS REINFORCEMENT																								A																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																		
CLEAR SPAN FEET	CLEAR SPAN INCHES	BARS A				BARS A1				BARS B & B1				BARS C				BARS E & E1				BARS F				BARS F1				BARS F2				BARS F3				BARS J				BARS J1				BARS M				BARS M1				BARS N				BARS O				BARS P				BARS P1				BARS P2				BARS P3				BARS																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																										
		SIZE	NO.	LENGTH FT-IN	SPAC. IN	SIZE	NO.	SHORT FT-IN	VAR. FT-IN	LONG FT-IN	SPAC. IN	SIZE	NO.	LENGTH FT-IN	SPAC. IN	NO.	LENGTH FT-IN	SIZE	NO.	LENGTH FT-IN	SPAC. IN	NO.	LENGTH FT-IN	NO.	LENGTH FT-IN	NO.	LENGTH FT-IN	NO.	LENGTH FT-IN	NO.	LENGTH FT-IN	NO.	LENGTH FT-IN	NO.	LENGTH FT-IN	NO.	LENGTH FT-IN	NO.	LENGTH FT-IN	NO.	LENGTH FT-IN	NO.	LENGTH FT-IN	NO.	LENGTH FT-IN	NO.	LENGTH FT-IN	NO.	LENGTH FT-IN	NO.	LENGTH FT-IN	NO.	LENGTH FT-IN	NO.	LENGTH FT-IN	NO.	LENGTH FT-IN	NO.	LENGTH FT-IN	NO.	LENGTH FT-IN	NO.	LENGTH FT-IN	NO.	LENGTH FT-IN	NO.	LENGTH FT-IN	NO.	LENGTH FT-IN	NO.	LENGTH FT-IN	NO.	LENGTH FT-IN	NO.	LENGTH FT-IN	NO.	LENGTH FT-IN	NO.	LENGTH FT-IN	NO.	LENGTH FT-IN	NO.	LENGTH FT-IN	NO.	LENGTH FT-IN	NO.	LENGTH FT-IN	NO.	LENGTH FT-IN	NO.	LENGTH FT-IN	NO.	LENGTH FT-IN	NO.	LENGTH FT-IN	NO.	LENGTH FT-IN	NO.	LENGTH FT-IN	NO.	LENGTH FT-IN	NO.	LENGTH FT-IN	NO.	LENGTH FT-IN	NO.	LENGTH FT-IN	NO.	LENGTH FT-IN	NO.	LENGTH FT-IN	NO.	LENGTH FT-IN	NO.	LENGTH FT-IN	NO.	LENGTH FT-IN	NO.	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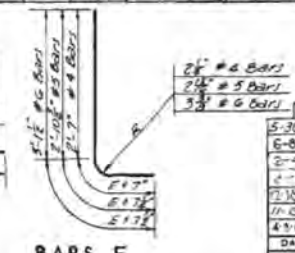
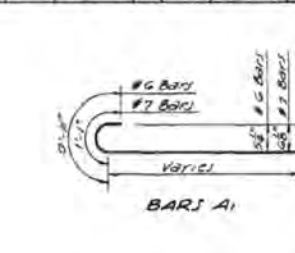
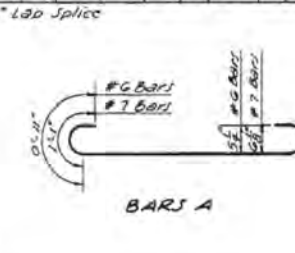
OPENING		QUANTITIES					
		PER LIN FT OF BARREL			44'-0" TULVER		
CLEAR	CLEAR	JTEEL	CONC	JTEEL	CONC		
FT	FT	LB/L	CU YDS	LB/L	CU YDS		
7	7	107.29	0.7634	6066	66.07		
8	7	116.18	0.8776	7315	71.51		
	8	121.82	0.9803	8146	83.55		
9	7	128.37	1.0247	8402	78.12		
	8	143.40	1.0741	9023	87.57		
10	9	150.80	1.1898	10244	101.49		
	7	148.83	1.1245	8902	83.92		
	8	153.61	1.2348	9544	95.19		
	9	163.80	1.2901	10878	108.33		
	10	173.27	1.4167	12881	121.64		



SECTION B - 6

GENERAL NOTES:

Construction Specifications: Latest Approval by Dept. of Highways Std. Specifications
Concrete Joist Formwork: As per Standard Specification by Int. Span. 1924
Live Load: HS20-44, or Military Loading whichever is greater.
All Concrete to be Class "A".
All Exposed Corners to have 6" Chamfer, unless otherwise noted.
Reinforcement shall be Billet-Steel A.S.T.M. A615 or Rail-Steel A.S.T.M. A616 or Axle-Steel
A.S.T.M. A517.
Cement Mortar Relating to Reinforcing Steel are to Bar Centers
1" Square or Plate; Filter Cloth (See Qual. Fina Products List) shall be
placed in contact with Concrete behind each Weep Hole, in addition to approx.
2 Cu. Ft. of Concrete Sand.
For Detail of Joints: See Std. Plan C.M.- 49.

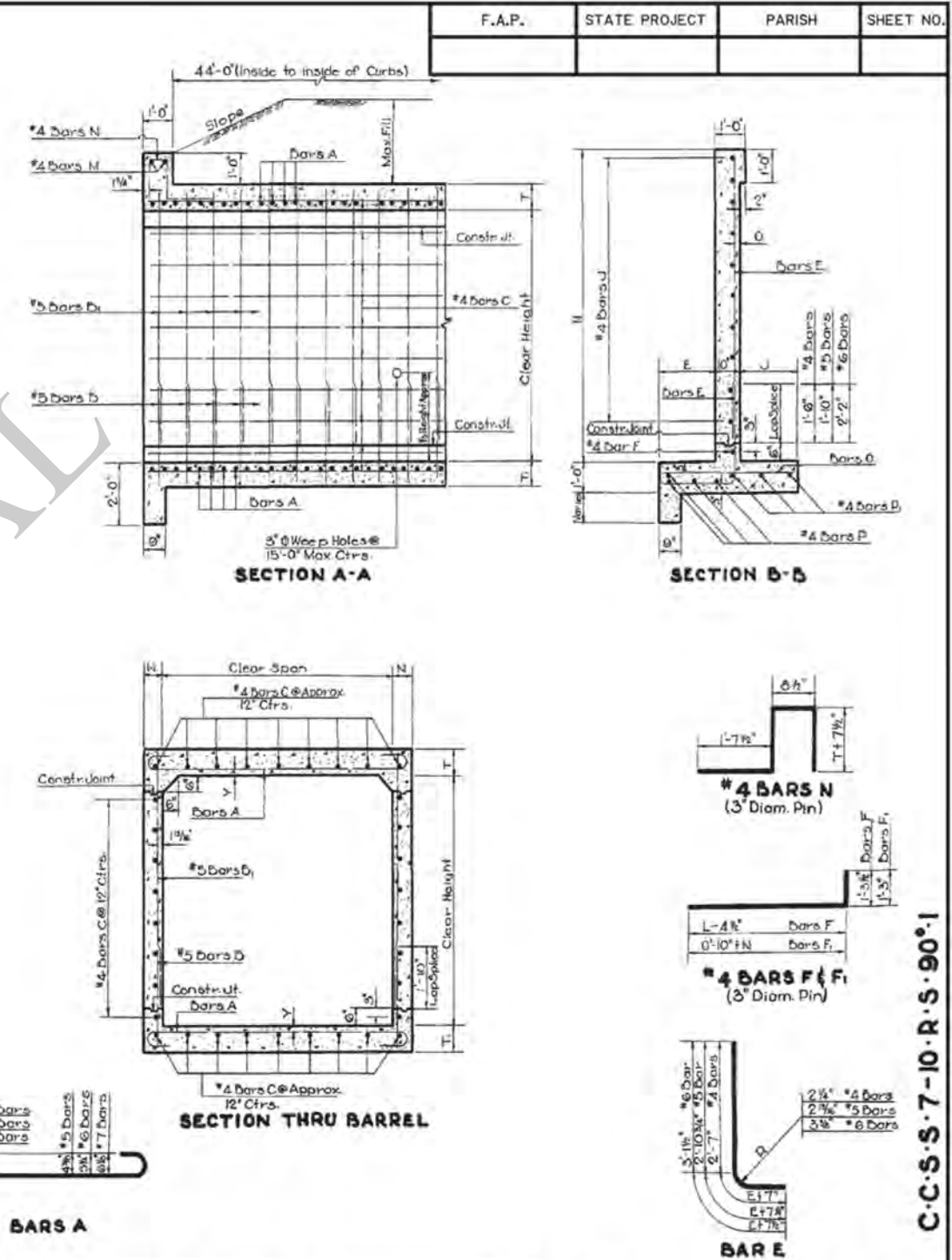


Bar:			
Bar:			
Bar:	1-11-74	Rev. Weep Hole Note	W.T.
5-30-75		Revised Spill Stop	W.T.
6-8-72		Rev General Notes for Steel	W.E.M.
2-4-72		Added 8" x 8" x 10 Spang	W.E.M.
2-7-72		2 x 8" x 10" Steel	W.E.M.
7-15-74		Rev General Notes	W.E.M.
11-13-74		8" x 8" Added 4 Notes for	W.E.M.
4-5-74		Reformed Dowels to Smooth	W.E.M.
DATE		DESCRIPTION	BY

STANDARD PLAN
REINF. CONCRETE BOX CULVERTS
 STRAIGHT WINGS 75° CROSSING
 2:1 SPILL SLOPE
 7' THRU 10' CLEAR SPANS & CLEAR HEIGHTS
 DATED APR 22 1964

STATE OF LOUISIANA
 DEPARTMENT OF HIGHWAYS

DESIGNED <u>J. C. McSwain</u>	DETAILED	TRACED <u>J. C. McSwain</u>
CHECKED <u>N. A. Brown</u>	CHECKED <u>J. C. McSwain</u>	CHECKED <u>J. C. McSwain</u>

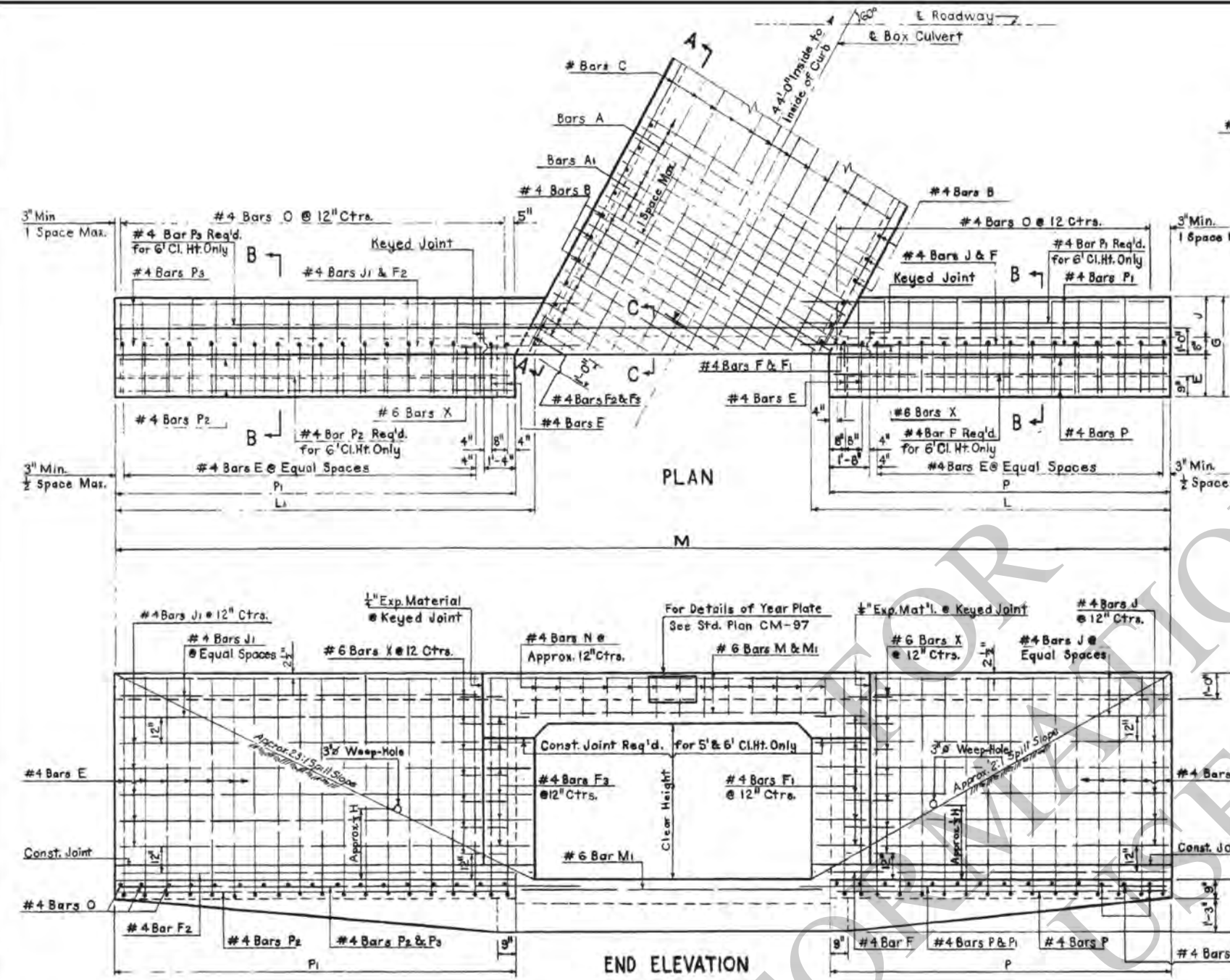


General Notes:
Construction Specifications: Latest Approved L.S. Dept.
of Highways Standard Specifications.
Design Specifications: A. A. S. H. C. 1961 as Amended
by Int. Spec. 1964.
Live Load HS 20-44, or Military Loading, whichever is Greater.
All Concrete to be Class "A".
All Exposed Corners to have $\frac{3}{4}$ " Chamfer, unless
otherwise noted.
Reinforcement Shall be Billet-Steel A.S.T.M. A 615 or Rail-Steel
A.S.T.M. A 616 or Asle-Steel A.S.T.M. A 617.
For Detail of Joints, See Spec. Part 5-09.
Dimensions Relating to Reinforcing Steel are to Bar
Centers.
A 1'-6" Square of Plastic Filter Cloth (See Qualified
Products List) shall be placed in contact with
Concrete behind each Weep Hole, in addition to
approx. 2 Cu. Ft. of Concrete Sand.

STANDARD PLAN
REINFC. CONCRETE BOX CULVERTS
STRAIGHT WINGS 90° CROSSING
2:1 SPILL SLOPE
7' THRU 10' CLEAR SPANS & CLEAR HEIGHTS

0' of Length.		6-5-72 Rev. General Notes for Steel 4-27-67 Added Note Steel 2-10-64 Rev General Notes 4-9-64 DEFORMED DIMELS X TO SMOOTH 6-7-63 ALL 10' SPANS ADDED		W.E.M. W.E.M. W.E.M. W.E.M. W.E.M.		DATED May 21, 1962	
STATE OF LOUISIANA DEPARTMENT OF HIGHWAYS							
1-5-78 Rev. Weap. Note		W.T.J.	4-28-67 Ps 2 Added		W.E.M.	DESIGNED 3 D. Nantz	
1-5-70 Rev Slope Intersect		W.T.J.	4-28-67 All 2' Added		W.E.M.	DETAILED H. H. H.	
DATE	DESCRIPTION	BY	DATE	DESCRIPTION	BY	TRACED & CHECKED	
REVISIONS			REVISIONS			CHECKED H. H. H. CHECKED M. H. H. CHECKED H. H. H.	
IN CHARGE OF							

F.A.P.	STATE PROJECT	PARISH	SHEET NO.



GENERAL NOTES:

Construction Specifications: Latest Approved La. Department of Highways Standard Specifications.

Design Specifications: A.A.S.H.O. 1969 as Amended to 1971.

Live Load: HS-20-44 or Military Loading Whichever is Greater.

All Concrete to be Class "A".

All Exposed Corners to have $\frac{3}{8}$ " Chamfer, Unless Otherwise Noted.

Reinforcement Shall be Billet-Steel A.S.T.M. A615 or Rail-Steel A.S.T.M. A616 or Axle-Steel A.S.T.M. A617.

Dimensions Relating to Reinforcing Steel are to Bar Centers.

A 1' x 6' Square of Plastic Filter Cloth (See Qualified Products List) shall be placed in contact with Concrete behind each Weep Hole, in addition to approx. 2 Cu. Ft. of Concrete Sand.

For Details of Joints, See Std. Plan C.M.-93.

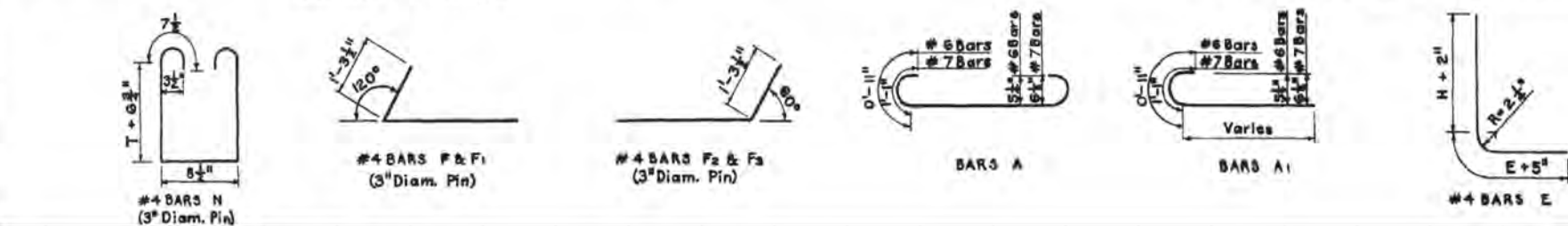
C.C.S.S.8-10-R-60°-1

APPROVED BY:
Dominy D. B. Jr.
CHIEF ENGINEER
DATE: 1-11-78

DIMENSIONS															BILL OF REINFORCING STEEL FOR 44'-0" CULVERT																																			QUANTITIES				OPENING																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																					
OPENING		MAX. FILL		BARREL		WING AND CURBS									BARREL REINFORCEMENT										WING AND CURB REINFORCEMENT																		PER LINEAR FT. OF BARREL		44'-0" CULVERT																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																														
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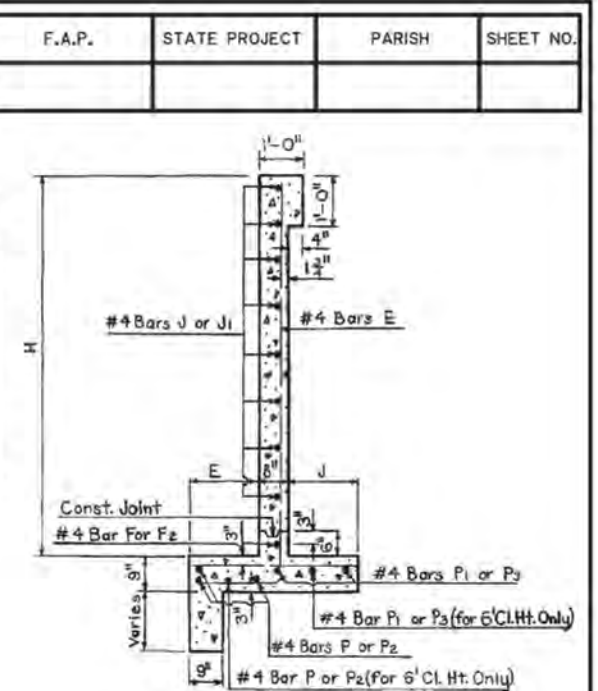
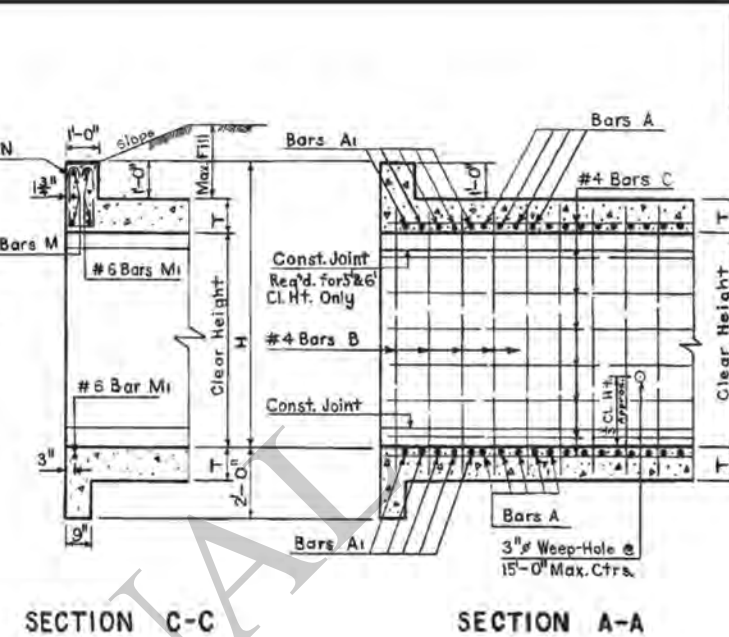
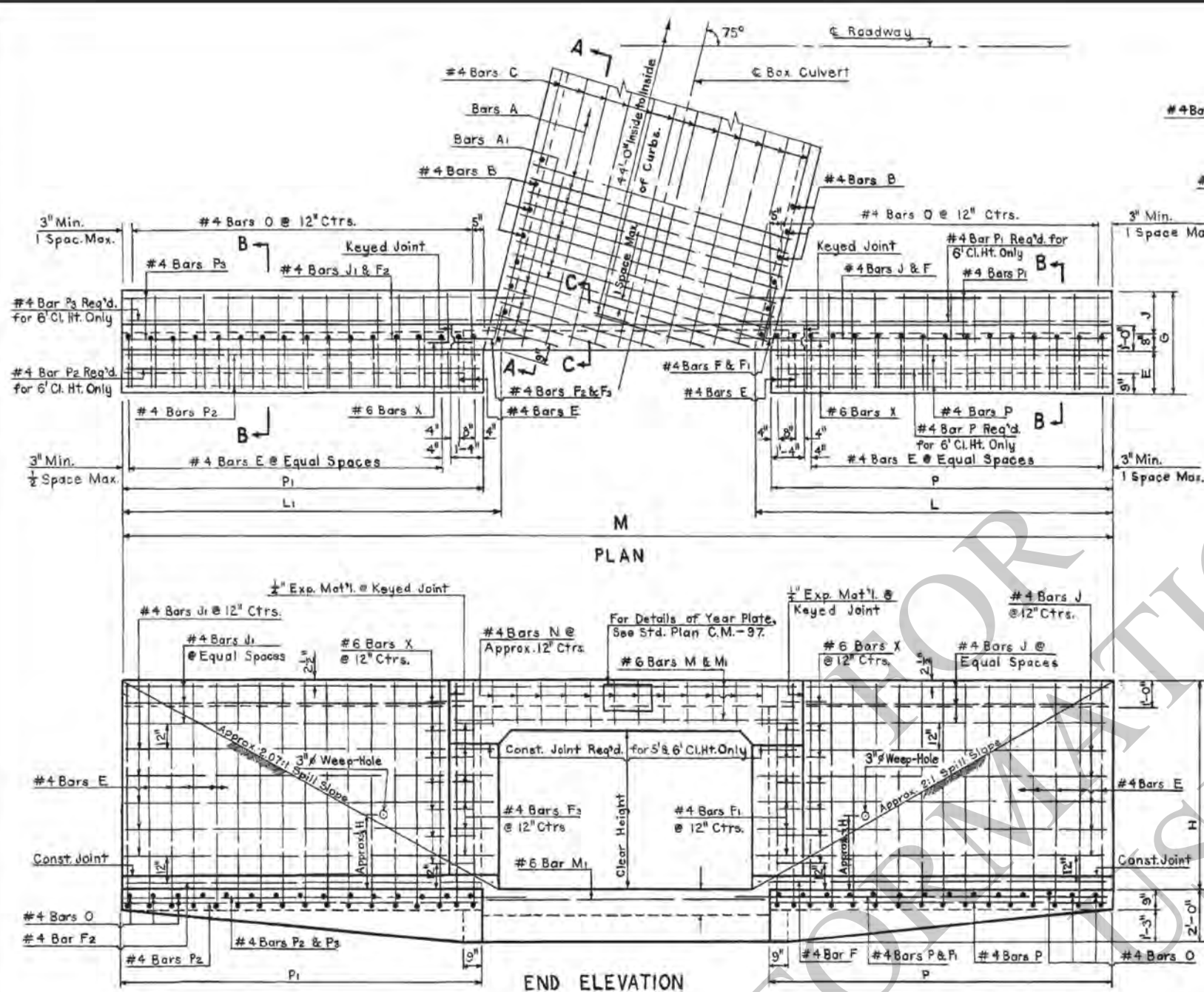
① Includes 1'-6" Lap Splice

② #6 Bars "X" to be $\frac{3}{8}$ " Smooth and Greased for 1'-0" of Length.



STANDARD PLAN
REINFORCED CONCRETE BOX CULVERT
STRAIGHT WINGS 60° CROSSING
8' TO 10' SPANS 2:1 SPILL SLOPE
4' TO 6' HEIGHTS
DATED: JAN. 6, 1972

STATE OF LOUISIANA			
DEPARTMENT OF HIGHWAYS			
DESIGNED	DATE	DRAWN	DATE
CHECKED	DATE	CHECKED	DATE
REVISIONS			
1-11-78	Rev. Weep Hole Note	W.T.J.	
2-20-78	Rev. Slope Intercept	W.T.J.	
6-8-78	Rev. General Notes for Steel	W.E.M.	



GENERAL NOTES:
Construction Specifications: Latest Approved La. Department of Highways Standard Specifications.
Design Specifications: A.A.S.H.O. 1969 as Amended to 1971.
Live Load: H.S. 20-44 or Military Loading Whichever is Greater.
All Concrete to be Class "A".
All Exposed Corners to have 3" Chamfer, Unless Otherwise Noted.
Reinforcement Shall be Billet-Steel A.S.T.M. A 615 or Rail-Steel A.S.T.M. A 616 or Axle-Steel A.S.T.M. A 617.
Dimensions Relating to Reinforcing Steel are to Bar Centers.
A 1'-0" Square of Plastic Filler Cloth (See Qualified Products List) shall be placed in contact with concrete behind each weep hole, in addition to approx. 2 Cu. Ft. of concrete sand.
For Details of Joints, See Std. Plan C.M.-49.

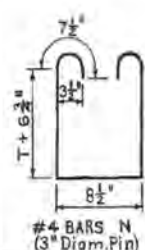
C.C.S.S. 8-10-R-75°-1

APPROVED BY: *Dennis D. White* 1-11-78
CHIEF ENGINEER DATE

DIMENSIONS																				BILL OF REINFORCING STEEL FOR 44'-0" CULVERT																																				QUANTITIES				OPENING																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																	
OPENING		MAX. FILL		BARREL		WING AND CURBS														BARREL REINFORCEMENT										WING AND CURB REINFORCEMENT																PER LINEAR FT. OF BARREL		44'-0" CULVERT		OPENING																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																											
CLEAR SPAN	CLEAR HEIGHT	AREA	SLAB	WALL	N	T	Y	E	J	G	H	L	LI	P	PI	M	BARS A				BARS A1				#4 BARS B				#4BARS C				#4 BARS E				#4BARS F				#4BARS F1				#4BARS F2				#4BARS F3				#4BARS J				#4BARS J1				#4BARS N				#4BARS O				#4BARS P				#4BARS P1				#4BARS P2				#4BARS P3				#6BARS M				#6BARS M1				#6BARS X				STEEL	CONC.	STEEL	CONC.	CLEAR SPAN	CLEAR HEIGHT																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																							
FT.	FT.	SQ.FT.	FT.	FT.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	IN.	SIZE	NO.	LGTH.	SPAC.	SIZE	NO.	LGTH.	SPAC.	SIZE	NO.	LGTH.	SPAC.	SIZE	NO.	LGTH.	SPAC.	SIZE	NO.	LGTH.	SPAC.	SIZE	NO.	LGTH.	SPAC.	SIZE	NO.	LGTH.	SPAC.	SIZE	NO.	LGTH.	SPAC.	SIZE	NO.	LGTH.	SPAC.	SIZE	NO.	LGTH.	SPAC.	SIZE	NO.	LGTH.	SPAC.	SIZE	NO.	LGTH.	SPAC.	SIZE	NO.	LGTH.	SPAC.	SIZE	NO.	LGTH.	SPAC.	SIZE	NO.	LGTH.	SPAC.	SIZE	NO.	LGTH.	SPAC.	SIZE	NO.	LGTH.	SPAC.	SIZE	NO.	LGTH.	SPAC.	SIZE	NO.	LGTH.	SPAC.	SIZE	NO.	LGTH.	SPAC.	SIZE	NO.	LGTH.	SPAC.	SIZE	NO.	LGTH.	SPAC.	SIZE	NO.	LGTH.	SPAC.	SIZE	NO.	LGTH.	SPAC.	SIZE	NO.	LGTH.	SPAC.	SIZE	NO.	LGTH.	SPAC.	SIZE	NO.	LGTH.	SPAC.	SIZE	NO.	LGTH.	SPAC.	SIZE	NO.	LGTH.	SPAC.	SIZE	NO.	LGTH.	SPAC.	SIZE	NO.	LGTH.	SPAC.	SIZE	NO.	LGTH.	SPAC.	SIZE	NO.	LGTH.	SPAC.	SIZE	NO.	LGTH.	SPAC.	SIZE	NO.	LGTH.	SPAC.	SIZE	NO.	LGTH.	SPAC.	SIZE	NO.	LGTH.	SPAC.	SIZE	NO.	LGTH.	SPAC.	SIZE	NO.	LGTH.	SPAC.	SIZE	NO.	LGTH.	SPAC.	SIZE	NO.	LGTH.	SPAC.	SIZE	NO.	LGTH.	SPAC.	SIZE	NO.	LGTH.	SPAC.	SIZE	NO.	LGTH.	SPAC.	SIZE	NO.	LGTH.	SPAC.	SIZE	NO.	LGTH.	SPAC.	SIZE	NO.	LGTH.	SPAC.	SIZE	NO.	LGTH.	SPAC.	SIZE	NO.	LGTH.	SPAC.	SIZE	NO.	LGTH.	SPAC.	SIZE	NO.	LGTH.	SPAC.	SIZE	NO.	LGTH.	SPAC.	SIZE	NO.	LGTH.	SPAC.	SIZE	NO.	LGTH.	SPAC.	SIZE	NO.	LGTH.	SPAC.	SIZE	NO.	LGTH.	SPAC.	SIZE	NO.	LGTH.	SPAC.	SIZE	NO.	LGTH.	SPAC.	SIZE	NO.	LGTH.	SPAC.	SIZE	NO.	LGTH.	SPAC.	SIZE	NO.	LGTH.	SPAC.	SIZE	NO.	LGTH.	SPAC.	SIZE	NO.	LGTH.	SPAC.	SIZE	NO.	LGTH.	SPAC.	SIZE	NO.	LGTH.	SPAC.	SIZE	NO.	LGTH.	SPAC.	SIZE	NO.	LGTH.	SPAC.	SIZE	NO.	LGTH.	SPAC.	SIZE	NO.	LGTH.	SPAC.	SIZE	NO.	LGTH.	SPAC.	SIZE	NO.	LGTH.	SPAC.	SIZE	NO.	LGTH.	SPAC.	SIZE	NO.	LGTH.	SPAC.	SIZE	NO.	LGTH.	SPAC.	SIZE	NO.	LGTH.	SPAC.	SIZE	NO.	LGTH.	SPAC.	SIZE	NO.	LGTH.	SPAC.	SIZE	NO.	LGTH.	SPAC.	SIZE	NO.	LGTH.	SPAC.	SIZE	NO.	LGTH.	SPAC.	SIZE	NO.	LGTH.	SPAC.	SIZE	NO.	LGTH.	SPAC.	SIZE	NO.	LGTH.	SPAC.	SIZE	NO.	LGTH.	SPAC.	SIZE	NO.	LGTH.	SPAC.	SIZE	NO.	LGTH.	SPAC.	SIZE	NO.	LGTH.	SPAC.	SIZE	NO.	LGTH.	SPAC.	SIZE	NO.	LGTH.	SPAC.	SIZE	NO.	LGTH.	SPAC.	SIZE	NO.	LGTH.	SPAC.	SIZE	NO.	LGTH.	SPAC.	SIZE	NO.	LGTH.	SPAC.	SIZE	NO.	LGTH.	SPAC.	SIZE	NO.	LGTH.	SPAC.	SIZE	NO.	LGTH.	SPAC.	SIZE	NO.	LGTH.	SPAC.	SIZE	NO.	LGTH.	SPAC.	SIZE	NO.	LGTH.	SPAC.	SIZE	NO.	LGTH.	SPAC.	SIZE	NO.	LGTH.	SPAC.	SIZE	NO.	LGTH.	SPAC.	SIZE	NO.	LGTH.	SPAC.	SIZE	NO.	LGTH.	SPAC.	SIZE	NO.	LGTH.	SPAC.	SIZE	NO.	LGTH.	SPAC.	SIZE	NO.	LGTH.	SPAC.	SIZE	NO.	LGTH.	SPAC.	SIZE	NO.	LGTH.	SPAC.	SIZE	NO.	LGTH.	SPAC.	SIZE	NO.	LGTH.	SPAC.	SIZE	NO.	LGTH.	SPAC.	SIZE	NO.	LGTH.	SPAC.	SIZE	NO.	LGTH.	SPAC.	SIZE	NO.	LGTH.	SPAC.	SIZE	NO.	LGTH.	SPAC.	SIZE	NO.	LGTH.	SPAC.	SIZE	NO.	LGTH.	SPAC.	SIZE	NO.	LGTH.	SPAC.	SIZE	NO.	LGTH.	SPAC.	SIZE	NO.	LGTH.	SPAC.	SIZE	NO.	LGTH.	SPAC.	SIZE	NO.	LGTH.	SPAC.	SIZE	NO.	LGTH.	SPAC.	SIZE	NO.	LGTH.	SPAC.	SIZE	NO.	LGTH.	SPAC.	SIZE	NO.	LGTH.	SPAC.	SIZE	NO.	LGTH.	SPAC.	SIZE	NO.	LGTH.	SPAC.	SIZE	NO.	LGTH.	SPAC.	SIZE	NO.	LGTH.	SPAC.	SIZE	NO.	LGTH.	SPAC.	SIZE	NO.	LGTH.	SPAC.	SIZE	NO.	LGTH.	SPAC.	SIZE	NO.	LGTH.	SPAC.	SIZE	NO.	LGTH.	SPAC.	SIZE	NO.	LGTH.	SPAC.	SIZE	NO.	LGTH.	SPAC.	SIZE	NO.	LGTH.	SPAC.	SIZE	NO.	LGTH.	SPAC.	SIZE	NO.	LGTH.	SPAC.	SIZE	NO.	LGTH.	SPAC.	SIZE	NO.	LGTH.	SPAC.	SIZE	NO.	LGTH.	SPAC.	SIZE	NO.	LGTH.	SPAC.	SIZE	NO.	LGTH.	SPAC.	SIZE	NO.	LGTH.	SPAC.	SIZE	NO.	LGTH.	SPAC.	SIZE	NO.	LGTH.	SPAC.	SIZE	NO.	LGTH.	SPAC.	SIZE	NO.	LGTH.	SPAC.	SIZE	NO.	LGTH.	SPAC.	SIZE	NO.	LGTH.	SPAC.	SIZE	NO.	LGTH.	SPAC.	SIZE	NO.	LGTH.	SPAC.	SIZE	NO.	LGTH.	SPAC.	SIZE	NO.	LGTH.	SPAC.	SIZE	NO.	LGTH.	SPAC.	SIZE	NO.	LGTH.	SPAC.	SIZE	NO.	LGTH.	SPAC.	SIZE	NO.	LGTH.	SPAC.	SIZE	NO.	LGTH.	SPAC.	SIZE	NO.	LGTH.	SPAC.	SIZE	NO.	LGTH.	SPAC.	SIZE	NO.	LGTH.	SPAC.	SIZE	NO.	LGTH.	SPAC.	SIZE	NO.	LGTH.	SPAC.	SIZE	NO.	LGTH.	SPAC.	SIZE	NO.	LGTH.	SPAC.	SIZE	NO.	LGTH.	SPAC.	SIZE	NO.	LGTH.	SPAC.	SIZE	NO.	LGTH.	SPAC.	SIZE	NO.	LGTH.	SPAC.	SIZE	NO.	LGTH.	SPAC.	SIZE	NO.	LGTH.	SPAC.	SIZE	NO.	LGTH.	SPAC.	SIZE	NO.	LGTH.	SPAC.	SIZE	NO.	LGTH.	SPAC.	SIZE	NO.	LGTH.	SPAC.	SIZE	NO.	LGTH.	SPAC.	SIZE	NO.	LGTH.	SPAC.	SIZE	NO.	LGTH.	SPAC.	SIZE	NO.	LGTH.	SPAC.	SIZE	NO.	LGTH.	SPAC.	SIZE	NO.	LGTH.	SPAC.	SIZE	NO.	LGTH.	SPAC.	SIZE	NO.	LGTH.	SPAC.	SIZE	NO.	LGTH.	SPAC.	SIZE	NO.	LGTH.	SPAC.	SIZE	NO.	LGTH.	SPAC.	SIZE	NO.	LGTH.	SPAC.	SIZE	NO.	LGTH.	SPAC.	SIZE	NO.	LGTH.	SPAC.	SIZE	NO.	LGTH.	SPAC.	SIZE	NO.	LGTH.	SPAC.	SIZE	NO.	LGTH.	SPAC.	SIZE	NO.	LGTH.	SPAC.	SIZE	NO.	LGTH.	SPAC.	SIZE	NO.	LGTH.	SPAC.	SIZE	NO.	LGTH.	SPAC.	SIZE	NO.	LGTH.	SPAC.	SIZE	NO.	LGTH.	SPAC.	SIZE	NO.	LGTH.	SPAC.	SIZE</

① Includes 1'-6" Lap Splice

② #6 Bars X to be 3/8" Smooth and Greased for 1'-0" of Length.



#4 BARS F & Fi
(3" Diam. Pin)

#4 BARS Fz & Fz
(3" Diam. Pin)

BARS A

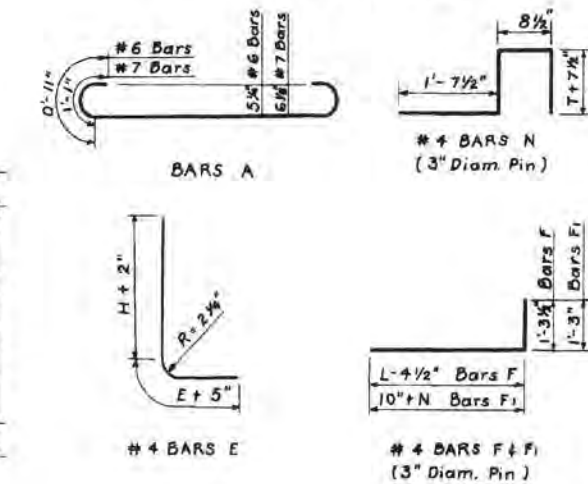
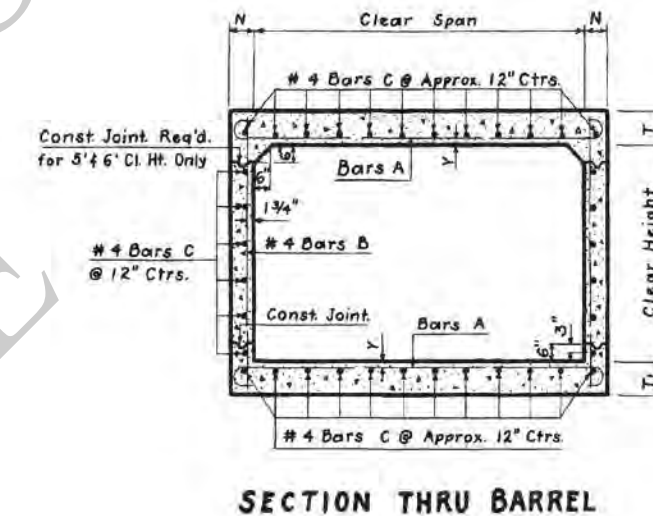
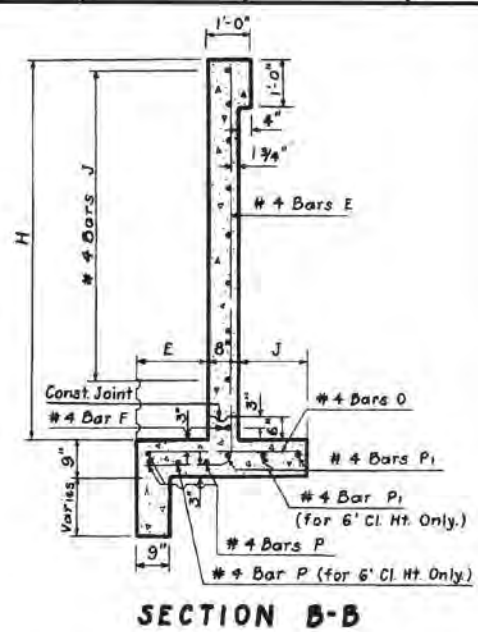
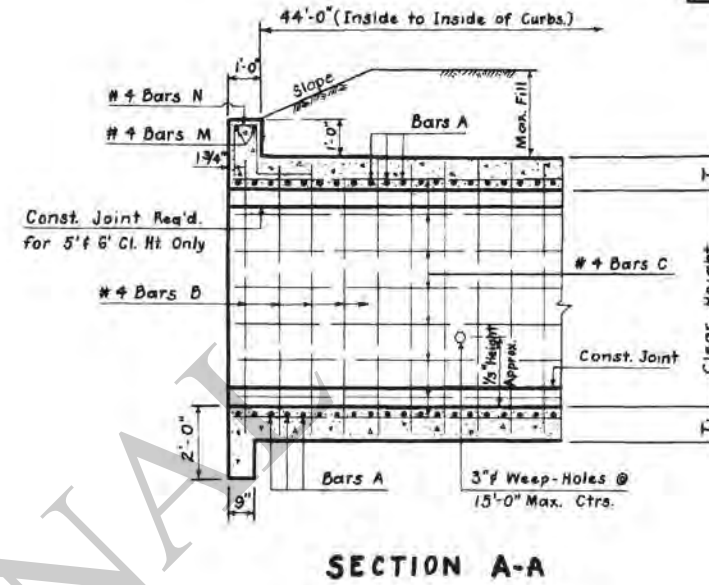
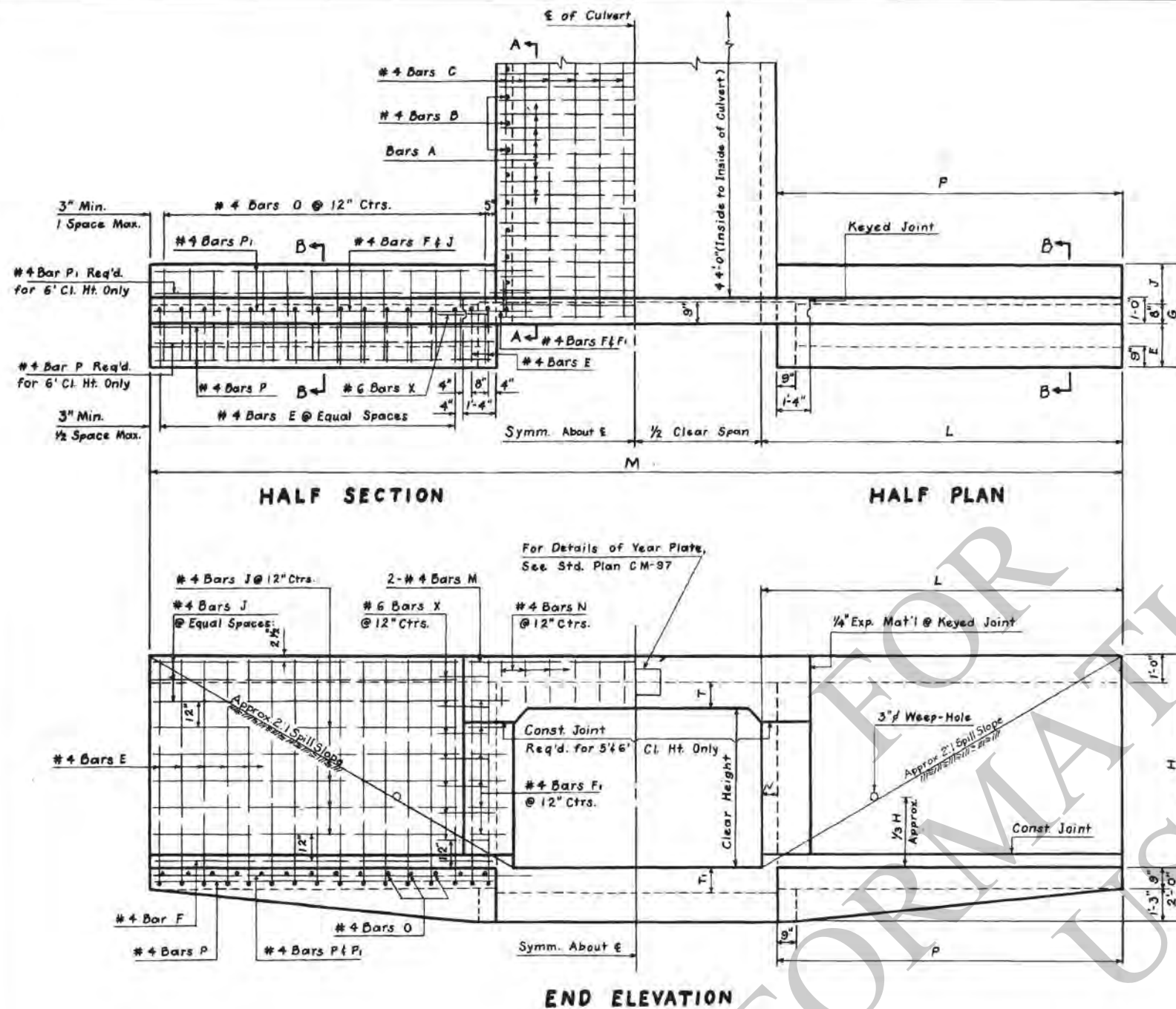
BARS Ai

#4 BARS E
(3" Diam. Pin)

STANDARD PLAN		
REINFORCED CONCRETE BOX CULVERT		
STRAIGHT WINGS 75° CROSSING		
8' TO 10' SPANS 2:1 SPILL SLOPE 4" TO 6" HEIGHTS		
DATED: REC 29 16 71		
STATE OF LOUISIANA		
DEPARTMENT OF HIGHWAYS		
DESIGNED	DETAILED J.J. RIBAS	TRACED M. LANOUX
CHECKED	CHECKED H. BAROUSSE	CHECKED J.D. BACCI
C.C.S.S. 8-10-R-75°-1		

REVISIONS	
1-11-78	Rev. Weep Hole Note
5-30-75	Revised Spill Slope
6-8-72	Rev. General Notes for Steel
DATE	DESCRIPTION
BY	BY

F.A.P.	STATE PROJECT	PARISH	SHEET NO.



DIMENSIONS															BILL OF REINFORCEMENT STEEL FOR 44'-0" CULVERT																									QUANTITIES				OPENING								
OPENINGS		MAX. FILL		BARREL			WINGS & CURBS					BARREL REINFORCEMENT					WINGS AND CURBS REINFORCEMENT															(A) PER LIN. FT. OF BARREL 44'-0" CULVERT																				
CLEAR SPAN	HEIGHT	AREA	SLAB	WALL	N	T	T ₁	Y	E	J	G	H	L	P	M	BARS A		#4 BARS B		#4 BARS C		#4 BARS E		#4 BARS F		#4 BARS F ₁		#4 BARS J		#4 BARS M		#4 BARS N		#4 BARS O		#4 BARS P		#4 BARS P ₁		#6 BARS X		STEEL	CONC.		STEEL	CONC.						
FT.	FT.	SQ. FT.	FT.	FT.	IN.	IN.	IN.	IN.	FT-IN.	FT-IN.	FT-IN.	FT-IN.	FT-IN.	FT-IN.	FT-IN.	SIZE	No.	LENGTH	SPAC.	No.	LENGTH	SPAC.	No.	LENGTH	SPAC.	No.	LENGTH	SPAC.	No.	LENGTH	SPAC.	No.	LENGTH	SPAC.	No.	LENGTH	SPAC.	No.	LENGTH	SPAC.	No.	LENGTH	SPAC.	FT.-IN.	No.	FT.-IN.	LBS.	CU. YDS.	LBS.	CU. YDS.	FT.	FT.
8	4	32	14	11	6	10	10	1 3/8	1-3	0-10	2-9	5-10	10-8	10-2	29-4	#6	220	10-0	5	92	5-4	12	26	47-2	44	7-8	12	4	11-7	16	2-7	24	8-6	4	11-1	18	5-3	40	2-4	12	9-10	8	11-6	20	2-0	96.89	0.7130	5241	44.44	4	4	
	5	40	13	6	6	10	10	1 3/8	1-5	1-2	3-3	6-10	12-8	12-2	33-4	#6	220	10-0	5	92	6-4	12	28	47-2	52	8-10	12	4	13-7	20	2-7	28	10-6	4	11-1	18	5-3	48	2-10	12	11-10	8	13-6	24	2-0	99.56	0.7500	5586	50.05	8	3	
	6	48	13	5	7	10	10	1 3/8	1-7	1-7	3-10	7-10	14-7	14-0	37-2	#6	220	10-2 1/2	5	92	7-4	12	30	47-2	64	10-0	11	4	15-6	24	2-8	32	12-4	4	11-3	20	5-3	56	3-5	16	13-8	12	15-4	28	2-0	103.44	0.8344	6126	58.38	8	3	
9	5	45	12	8	7	10 1/2	10 1/2	1 1/4	1-5	1-2	3-3	6-10 1/2	12-9	12-2	34-6	#7	184	11-5 1/2	6	92	6-5	12	30	47-2	52	8-10 1/2	12	4	13-8	20	2-8	28	10-6	4	12-3	22	5-4	48	2-10	12	11-10	8	13-6	24	2-0	122.30	0.8843	6667	56.41	9	3	
	6	54	12	5	7	10 1/2	10 1/2	1 1/4	1-7	1-7	3-10	7-10 1/2	14-7	14-0	38-2	#7	184	11-5 1/2	6	92	7-5	12	32	47-2	64	10-0 1/2	11	4	15-6	24	2-8	32	12-4	4	12-3	22	5-4	56	3-5	16	13-8	12	15-4	28	2-0	124.97	0.9275	7143	62.84	9	3	
10	5	50	10	11	8	11	11	1 1/4	1-5	1-2	3-3	6-11	12-10	12-2	35-8	#7	184	12-7 1/2	6	92	6-6	12	32	47-2	52	8-11	12	4	13-9	20	2-9	28	10-6	4	13-5	24	5-5	48	2-10	12	11-10	8	13-6	24	2-0	133.28	1.0257	7188	63.10	10	3	
	6	60	10	6	8	11	11	1 1/4	1-7	1-7	3-10	7-11	14-8	14-0	38-4	#7	184	12-7 1/2	6	92	7-6	12	34	47-2	64	10-1	11	4	15-7	24	2-9	32	12-4	4	13-5	24	5-5	56	3-5	16	13-8	12	15-4	28	2-0	135.95	1.0751	7664	69.82	10	3	

① Includes 1'-6" Lap Splice.

② #6 Bars X to be 3/4" Smooth and Greased for 1'-0" of Length.

GENERAL NOTES:

Construction Specifications: Latest Approved La. Dept. of Highways Standard Specifications.
Design Specifications: A.A.H.O. 1968 as Amended to 1971.
Live Load: HS 20-44 or Military Loading Whichever is Greater.
All Concrete to be Class "A".
All Exposed Corners to have 3/4" Chamfer Unless Otherwise Noted.
Reinforcement shall be Blot-Steel A.S.T.M. A615 or Rail-Steel A.S.T.M. A616 or Axle-Steel A.S.T.M. A617.
Dimensions Relating to Reinforcing Steel are to Bar Centers.
A 1'-6" Square of Plastic Filter Cloth (See Qualified Products List) shall be placed in contact with Concrete behind each Weep Hole, in addition to approx. 2 Cu. Ft. of Concrete Sand.
For Detail of Joints, See Std. Plan C.M.-48.

C.C.S.S.8-10-R-90°-1

STANDARD PLAN
REINFORCED CONCRETE BOX CULVERT
STRAIGHT WINGS 90° CROSSING
2:1 SPILL SLOPE
8' TO 10' SPANS 4' TO 6' HEIGHTS
DATED NOV. 30, 1971

APPROVED BY:

Dennis D. G. Smith
CHIEF ENGINEER

1-11-78
DATE

DATE	DESCRIPTION	BY
1-11-78	Rev. Weep Hole Note	W.T.J.
1-29-75	Rev. Slope Intercept	W.T.J.
6-8-72	Rev. General Notes for Steel	W.E.M.

STATE OF LOUISIANA DEPARTMENT OF HIGHWAYS			
DESIGNED	DETAILED J.J. RIBAS	TRACED E.B. ALLEN	
CHECKED	CHECKED J.D. BACCI	CHECKED J.D. BACCI	

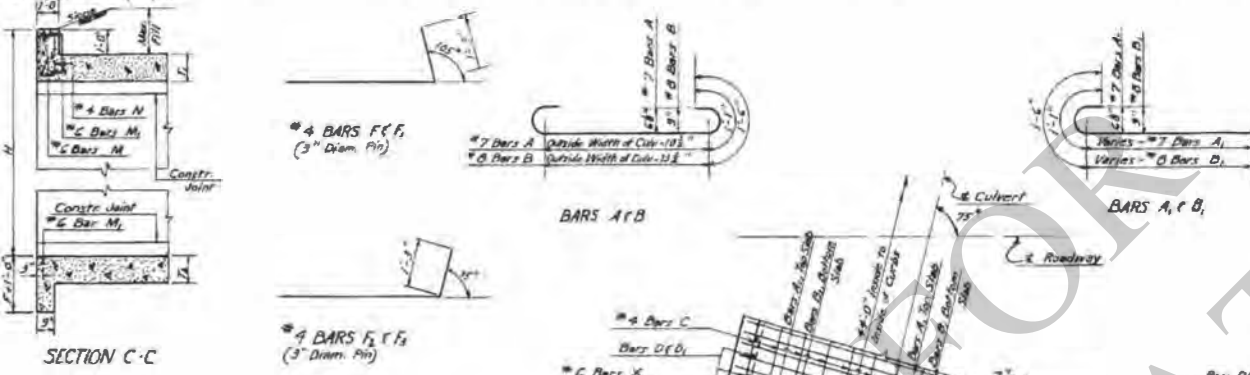
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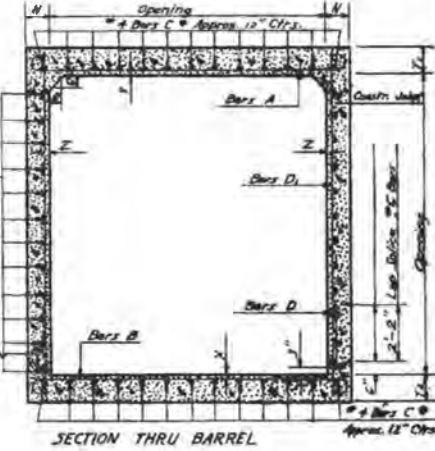
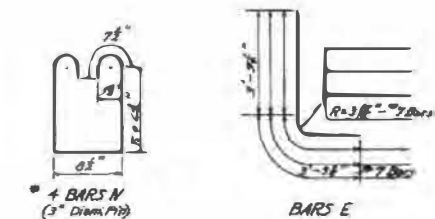
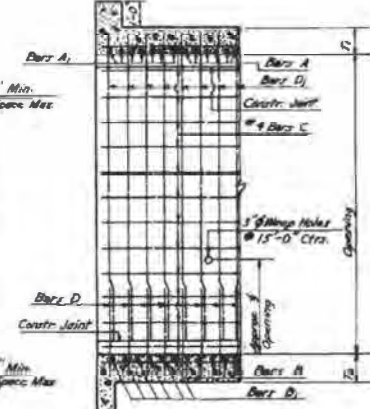
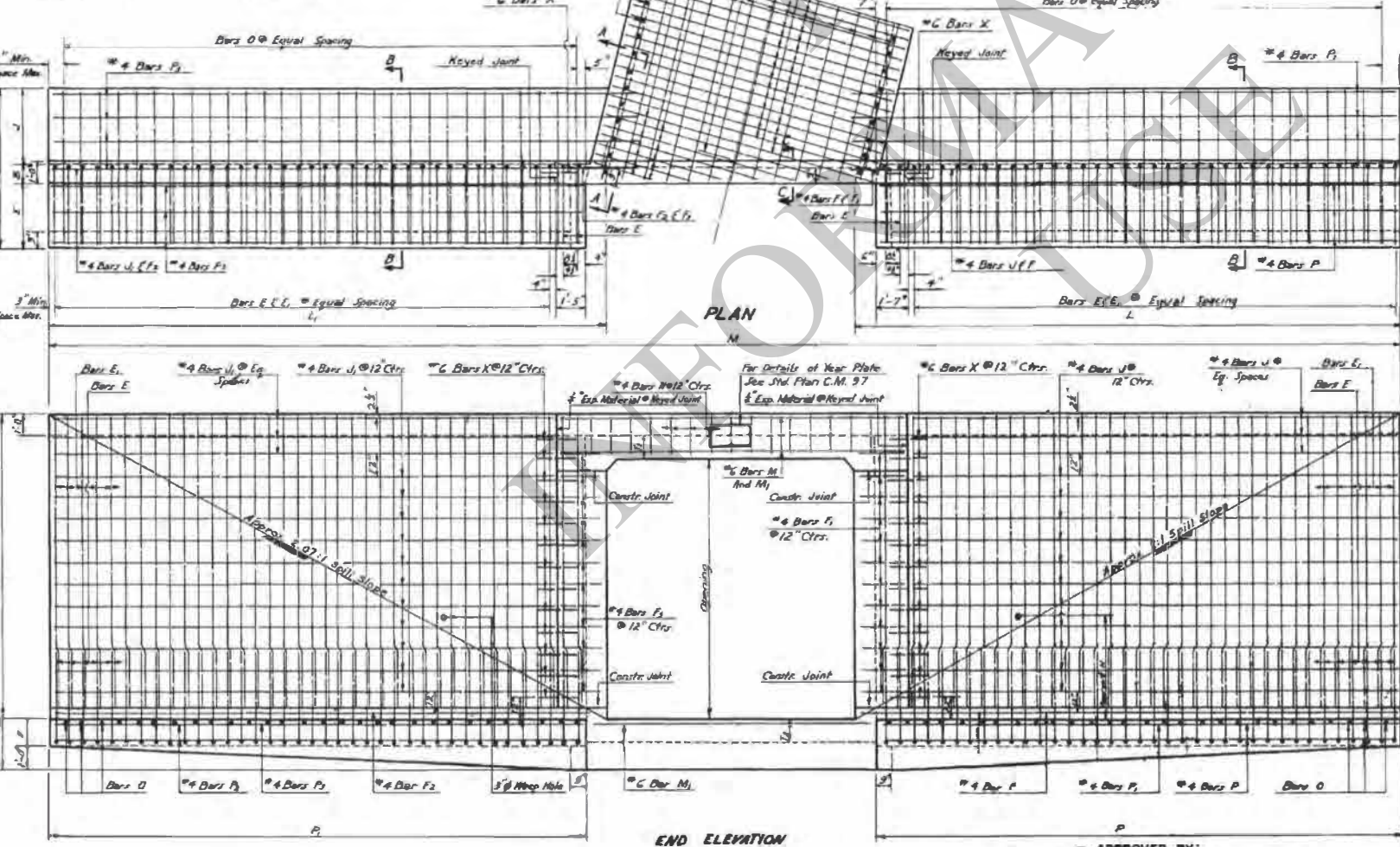
BILL OF REINFORCING STEEL FOR 44'-0" CULVERT																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																														
OPENINGS		BARREL REINFORCEMENT																				WINGS AND CURB REINFORCEMENT																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																								
CLEAR SPAN	HEIGHT	BARS A				BARS A ₁				BARS B				BARS B ₁				BARS C		BARS D, D ₁				BARS E, E ₁				BARS F		BARS F ₁		BARS G		BARS G ₁		BARS H		BARS H ₁		BARS I		BARS I ₁		BARS J		BARS J ₁		BARS K		BARS K ₁		BARS L		BARS L ₁		BARS M		BARS M ₁		BARS N		BARS N ₁		BARS O		BARS O ₁		BARS P		BARS P ₁		BARS Q		BARS Q ₁		BARS R		BARS R ₁																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																
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Includes 1'-6" Lap Splice

* 6 Bars X to be 3/4" smooth and dressed for 1'-0" of length.



DIMENSIONS										QUANTITIES									
OPENINGS		MAX. FILL		BARREL						WINGS AND CURBS									
CLEAR SPAN	HEIGHT	AREA	SLAB	WALL	N	T	X	Y	Z	D	E	F	G	H	I	J	K	L	M
FEET	FEET	SQ. FT.	FEET	FEET	IN.	IN.	IN.	IN.	IN.	FEET	FEET	FEET	FEET	FEET	FEET	FEET	FEET	FEET	FEET
12	9	108	6	12	13	13	2	1 1/2	1 1/2	1-0	3-0	1-3	3-4	7-4	19-1	1 1/2	27-3/4	27-3/4	26-3
10	8	80	6	12	13	13	2	1 1/2	1 1/2	1-0	3-0	1-3	3-4	7-4	19-1	1 1/2	27-3/4	27-3/4	26-3
11	9	99	6	12	13	13	2	1 1/2	1 1/2	1-0	3-0	1-3	3-4	7-4	19-1	1 1/2	27-3/4	27-3/4	26-3
12	10	120	6	12	13	13	2	1 1/2	1 1/2	1-0	3-0	1-3	3-4	7-4	19-1	1 1/2	27-3/4	27-3/4	26-3

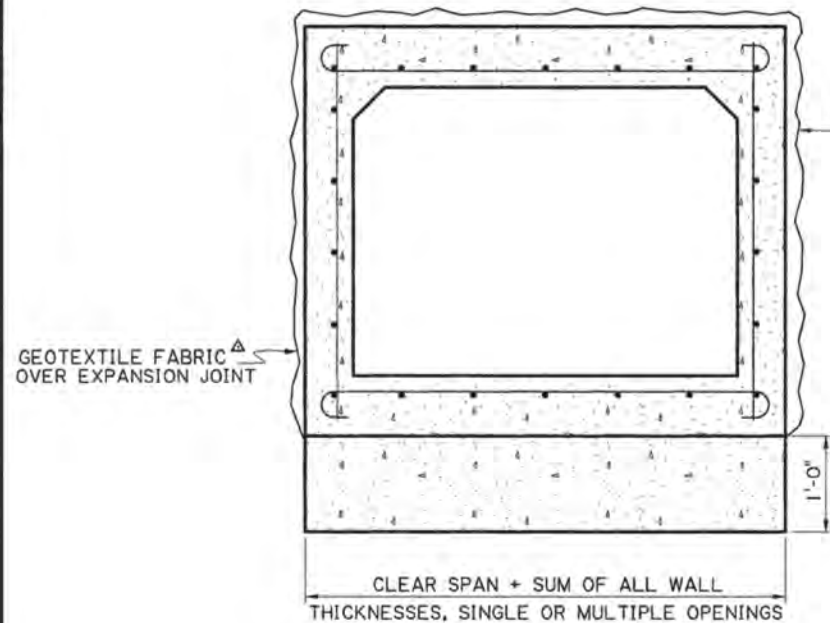


STANDARD PLAN
REINFORCED CONCRETE BOX CULVERT
STRAIGHT WINGWALLS
2:1 SLOPE NORMAL TO CHANNEL
12' CLEAR SPAN
8' TO 12' CLEAR HEIGHT

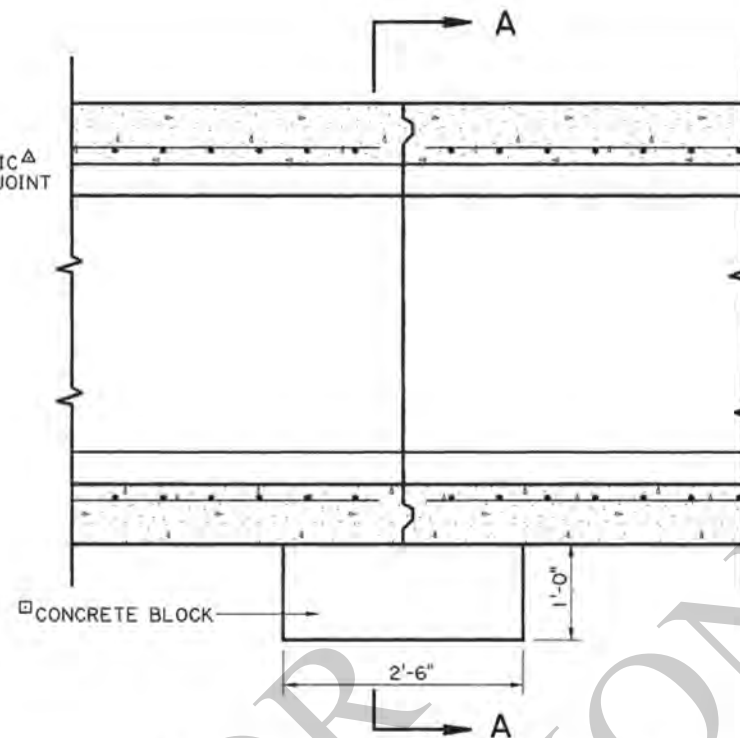
STATE OF LOUISIANA
DEPARTMENT OF HIGHWAYS

APPROVED BY: [Signature]
DATE: 1-11-78

CC-S-S-12-RS-75°-2



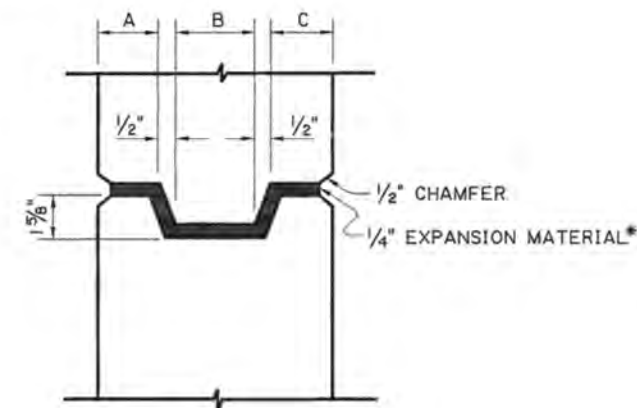
SECTION A-A



LONGITUDINAL BARREL SECTION

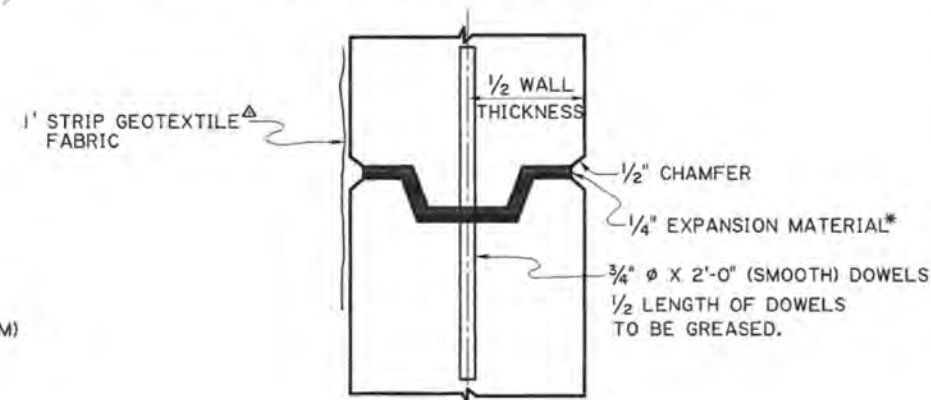
KEYED EXPANSION JOINTS (SEE DETAIL "A") TO BE SPACED SO THAT BARREL SHALL NOT BE CONTINUOUS FOR MORE THAN 200'. NO REINFORCING STEEL SHALL EXTEND THROUGH JOINT.

CONCRETE BLOCK TO BE PAID FOR AS CLASS "A" CONCRETE. CONCRETE BLOCK IS NOT REQUIRED IF A WORKING TABLE (DRY BOTTOM) IS CAST AS A BASE FOR PLACEMENT IN THE FIELD.

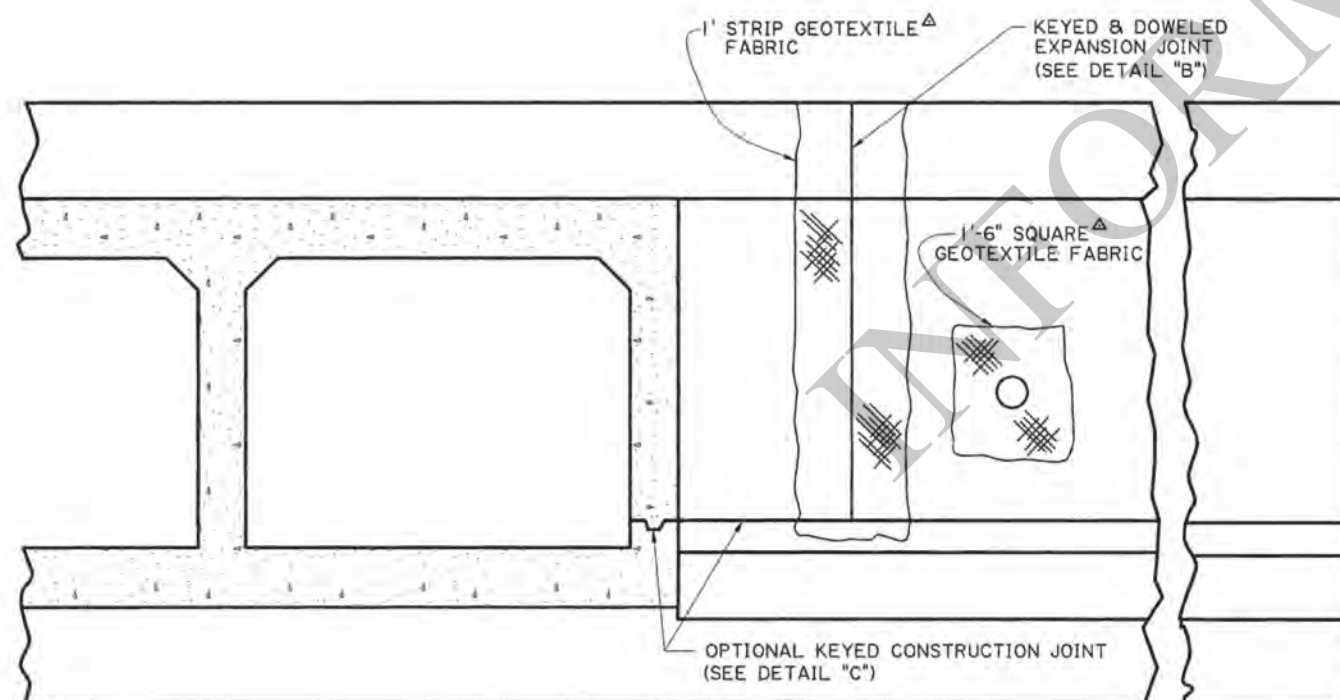


DETAIL "A"
KEYED EXPANSION JOINT

* IN ACCORDANCE WITH PROJECT SPECIFICATIONS FOR PREFORMED JOINT FILLERS (PREFORMED RESILIENT BITUMINOUS TYPES)

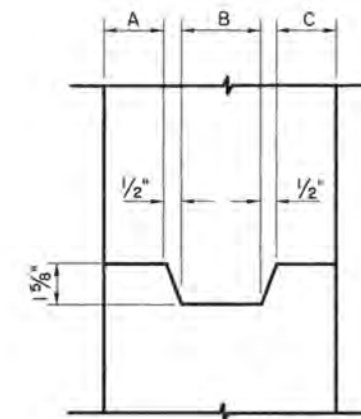


DETAIL "B"
KEYED & DOWELED
EXPANSION JOINT
(FOR BOX CULVERT WING WALLS)



SECTION SHOWING REAR SIDE OF WING WALL

WALL OR SLAB	A	B	C
6"	1 1/2"	2"	1 1/2"
6 1/2"	1 5/8"	2 1/4"	1 5/8"
7"	1 3/4"	2 1/2"	1 3/4"
7 1/2"	2"	2 1/2"	2"
8"	2 1/8"	2 3/4"	2 1/8"
8 1/2"	2 3/8"	2 3/4"	2 3/8"
9"	2 1/2"	3"	2 1/2"
9 1/2"	2 3/4"	3"	2 3/4"
10"	2 7/8"	3 1/4"	2 7/8"
10 1/2"	3"	3 1/2"	3"
11"	3 1/8"	3 3/4"	3 1/8"
11 1/2"	3 1/4"	4"	3 1/4"
12"	3 1/2"	4"	3 1/2"



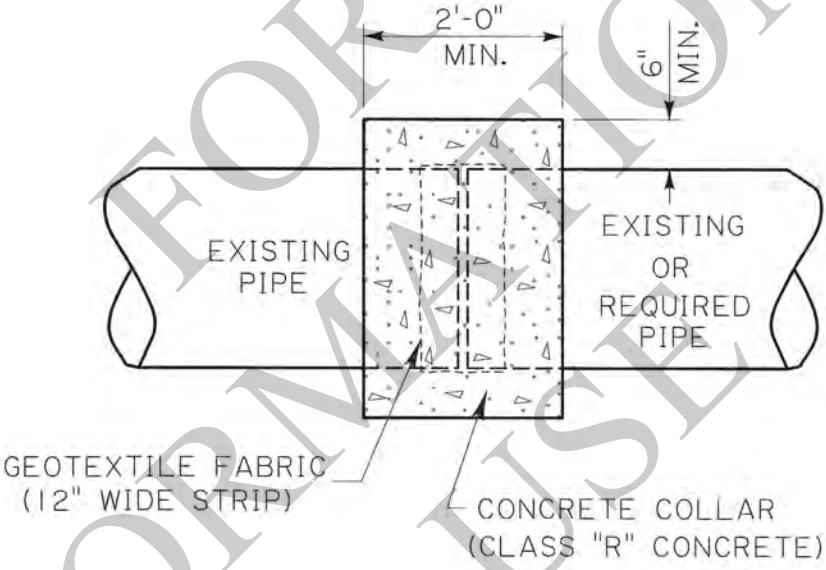
DETAIL "C"
KEYED CONSTRUCTION JOINT

IN ACCORDANCE WITH PROJECT SPECIFICATIONS FOR GEOTEXTILE FABRIC

SHEET NUMBER		PARISH		FEDERAL PROJECT		STATE PROJECT	
10-1-08		JDK		JDK		JDK	
GENERAL REVISIONS		REVISION DESCRIPTION		DATE		DATE	
10-1-08		GENERAL REVISIONS		10-1-08		10-1-08	
APPROVED BY		DATE		DATE		DATE	
CHIEF ENGINEER		10-1-08		10-1-08		10-1-08	
EXPANSION AND CONSTRUCTION JOINT FOR CONCRETE STRUCTURES		CM-49		HYDRAULICS SECTION		HYDRAULICS SECTION	

CONCRETE COLLAR DETAIL

TO REPAIR EXISTING PIPE JOINT SEPARATION
AND/OR
TO CONNECT EXISTING PIPE TO NEW PIPE



NOTES:

- 1) NEW PIPE EXTENSION SHALL MATCH EXISTING PIPE IN MATERIAL TYPE AND SIZE BASED ON THE LATEST INDUSTRY STANDARDS.

SHEET NUMBER		PARISH		CONTROL SECTION		STATE PROJECT	
DESIGN	CHECK	DETAIL	CHECK	REVIEW	SERIES		
STATE OF LOUISIANA MITRA HASHEMIEH REG. No. 28546 REGISTERED PROFESSIONAL ENGINEER IN CIVIL ENGINEERING <i>M. Hashemieh</i> 5/5/2022							
APPROVED BY CHIEF ENGINEER: <i>Christy P. Foy</i> DATE: 5/6/2022							
STATE OF LOUISIANA CONFIDENTIAL							
CONCRETE COLLAR DETAIL							
STANDARD PLAN COLLAR-01							
DOTD LOUISIANA DEPARTMENT OF TRANSPORTATION & DEVELOPMENT							
HYDRAULICS SECTION							

ROADWAY SHOWING JOINTS

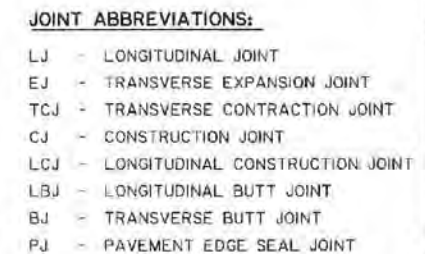


TABLE 1 - SCHEDULE OF DIMENSIONS
(ALL DIMENSIONS ARE IN INCHES)

SLAB THICKNESS	SMOOTH DOWEL BARS			DEFORMED TIE BARS			KEYWAY	
"T"	SIZE (DIA.)	LENGTH	SPACING	SIZE (DIA.)	LENGTH	SPACING	A ±1/4"	B ±1/4"
8	1/4	18	12	1/2	24	24	2 1/2	1 1/4
9	1/4	18	12	1/2	24	24	2 1/2	1 1/4
10	1/2	18	12	1/2	24	24	2 1/2	1 1/4
11	1/2	18	12	3/8	30	24	2 1/2	1 1/4
12	1/2	18	12	3/8	30	24	3	1 1/2
13	1/2	18	12	3/8	30	24	3	1 1/2
14	1/2	18	12	3/8	30	24	3	1 1/2

- * USE TYPE LCJ JOINT WITH SPLIT SLAB CONSTRUCTION.
- ⊕ WHEN POSSIBLE, AT CATCH BASINS NO JOINTS SHALL BE PLACED IN THE LIMITS SHOWN.
- △ TRANSVERSE JOINTS NEAR CATCH BASIN (CB-07, Q8 & Q9) THAT EXTEND INTO THE PAVEMENT SHALL BE ADJUSTED TO COINCIDE WITH ONE EDGE OF THE CATCH BASIN OR THE CENTER OF THE CATCH BASIN. SEE DETAIL E (SHEET 3 OF 3).
- Ⓝ SEE SECTION C-C (SHEET 2 OF 3) AND DETAIL "G" (SHEET 3 OF 3) FOR EJ-4" JOINT, SLEEPER SLAB AND DRAINAGE DETAILS. (REQUIRED (3) PLACES.)
- ⊙ CJ OR TCJ JOINTS AT 20' MAX. CTRS.

NOTE: MAXIMUM JOINT SPACING AT 18' WHEN PAVEMENT IS PLACED ON PERMEABLE BASE. (SEE SECTION 307)

NOTES:

- ① PAVEMENT EDGES SHALL BE SLIGHTLY ROUNDED (1/4" APPROX.).
 - ② ASPHALT CONCRETE SHOULDER:
THE SHOULDER JOINTS SHALL BE SAW CUT AND CONSTRUCTED IN ACCORDANCE WITH SECTION 1-I (SHEET 2 OF 3).
 - ③ FOR SECTIONS A-A THROUGH J-J (SEE SHEET 2 OF 3).
 - ④ ALL JOINTS TO BE USED WHERE SHOWN ON THIS SHEET OR AS SHOWN ELSEWHERE IN THE PLANS OR AS OTHERWISE DIRECTED BY THE ENGINEER.
 - ⑤ ON TYPE EJ ALTERNATE JOINTS, SPOT WELD ALTERNATE ENDS OF DOWEL BARS TO DOWEL BASKETS AND PLACE EXPANSION TUBES ON FREE ENDS OF DOWEL BARS.
 - ⑥ FOR DESIGN SPEEDS GREATER THAN 45MPH:
SAW CUT AND CONSTRUCT THE TYPE L.J, TCJ, AND CJ JOINTS AS IN DETAILS "A, B OR C" TO A DEPTH OF T/3 INCHES. THOROUGHLY CLEAN THE JOINT FACES BY SANDBLASTING; FOLLOWED BY AN OIL-FREE AIR JET IMMEDIATELY PRIOR TO SEALING WITH A POURED OR EXTRUDED SEALANT CONFORMING TO SECTION 1005.
 - ⑦ FOR DESIGN SPEEDS OF 45MPH OR LESS:
 - A. SAW CUT AND SEAL TYPE LJ JOINTS AS DESCRIBED IN NOTE 6.
 - B. CONSTRUCT TYPE TCJ OR CJ JOINTS AS DESCRIBED IN NOTE 6 OR CONSTRUCT WITH A REMOVABLE FORMING DEVICE AS SPECIFIED IN DETAIL "C" (SHEET 3 OF 3). THOROUGHLY CLEAN THE JOINT FACES BY SAND-BLASTING; FOLLOWED BY AN OIL-FREE AIR JET IMMEDIATELY PRIOR TO SEALING WITH A POURED OR EXTRUDED SEALANT CONFORMING TO SECTIONS 601 AND 1005.
 - ⑧ EXCEPT AS NOTED BELOW, DOWEL BARS & TIE BARS SHALL BE HELD IN PLACE BY SUPPORTS SIMILAR TO THE ONES SHOWN, OR APPROVED EQUALS. APPROVED MECHANICAL PLACEMENT OF DOWEL BARS AND TIE BARS WILL BE ALLOWED WITH ALL PAVING METHODS.
 - ⑨ INSTALL GEOTEXTILE FABRIC (TYPE B, C, OR D) UNDER ALL TCJ, CJ, AND EJ ALTERNATE JOINTS WHEN CONCRETE PAVEMENT IS PLACED ON PERMEABLE BASE. WHEN DOWEL BARS ARE MECHANICALLY IMPLANTED, THE GEOTEXTILE FABRIC SHALL BE ANCHORED TO THE BASE COURSE WITH PINS.
 - ⑩ WHEN CONSTRUCTING CONCRETE CURB AND GUTTER ADJACENT TO NEW P.C.C. PAVEMENT, USE TYPE LCJ JOINT. WHEN ADJACENT TO EXISTING P.C.C. PAVEMENT, USE TYPE LBJ JOINT. THE FIRST LOAD TRANSFER DEVICE SHALL BE INSTALLED 18" FROM THE PAVEMENT EDGE.
 - ⑪ TRANSVERSE EXPANSION JOINTS ARE NOT TO BE USED FOR CONSTRUCTION JOINTS.
 - ⑫ CONCRETE SHOULDERS:
 - A. CONSTRUCT TCJ JOINTS IN ACCORDANCE WITH SECTION B-B (SHEET 2 OF 3).
 - B. CONSTRUCT LCJ JOINTS IN ACCORDANCE WITH TYPE LCJ DETAIL AND LJ JOINTS IN ACCORDANCE WITH TYPE LJ DETAIL. SEE SECTION D-D (SHEET 2 OF 3).
 - C. USE THE MAXIMUM SHOULDER THICKNESS WHEN DETERMINING DOWEL BAR AND TIE BAR SIZES IN TABLE 1.
 - D. WHEN SKEWED JOINTS ARE USED ON MAINLINE PAVING THE SHOULDER TCJ JOINTS MAY BE SKEWED OR CONSTRUCTED AT 90°.
 - E. SHOULDER JOINTS AND JOINT MATERIALS SHALL MATCH THE MAINLINE.
 - F. HEIGHT OF DOWEL BASKET SHALL BE BASED ON THE THINNEST SHOULDER THICKNESS. VARYING HEIGHT DOWEL BASKETS WILL BE ALLOWED TO KEEP THE DOWEL BAR LOCATED WITHIN TOLERANCE.

NOT TO SCALE

ROAD DESIGN

PORTLAND CEMENT CONCRETE
PAVEMENT DETAILS

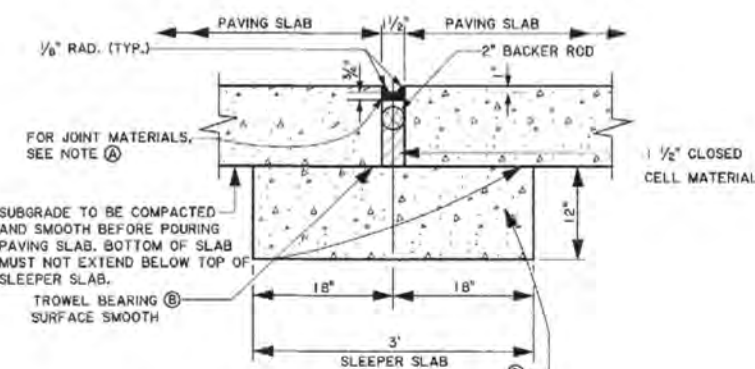
DOTD
LOUISIANA DEPARTMENT OF
TRANSPORTATION & DEVELOPMENT

STANDARD	SP. CI.
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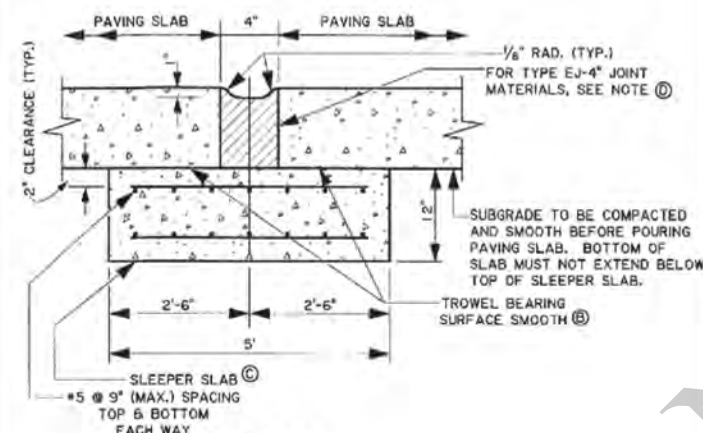
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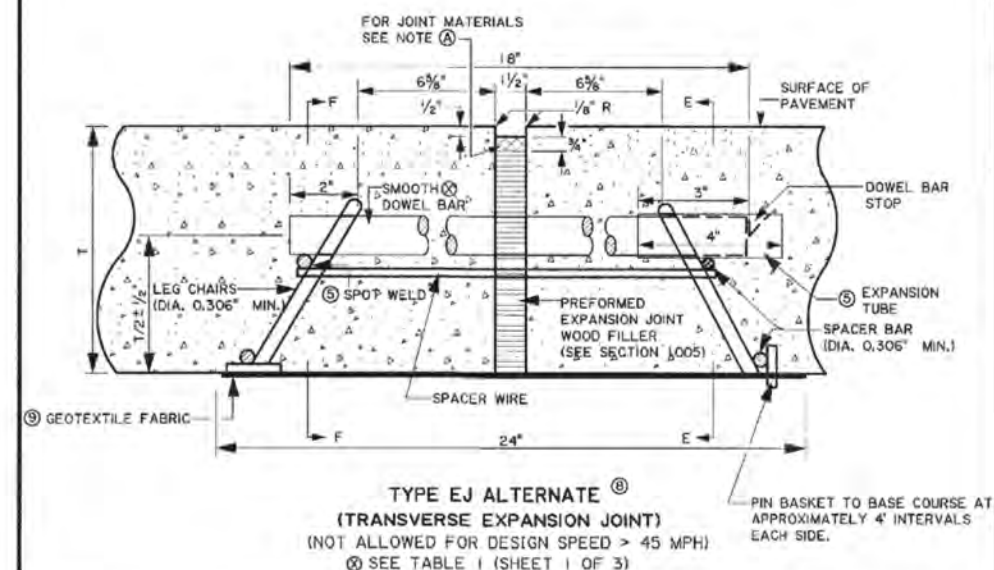
- (A) ONE OR TWO COMPONENT SILICONE CONFORMING TO SECTION 1005.
- (B) TAR PAPER EQUIVALENT TO 30 LBS./100 FT² SHALL BE PLACED BETWEEN THE SLEEPER SLAB AND THE PAVING SLAB.
- (C) SLEEPER SLAB SHALL BE CONSTRUCTED OF CLASS "A1" OR PAVEMENT TYPE CONCRETE AND INCLUDED IN THE COST OF THE PAVEMENT. PROVIDE DEFORMED GRADE 60 REINFORCING STEEL.
- (D) JOINT SHALL BE FILLED WITH A PREFORMED POLYURETHANE FOAM TYPE FILLER CONFORMING TO SECTION 1005.
- (E) SEE DETAIL "G" - EJ-4" BASE DRAIN OUTLET FOR UNDERDRAIN DETAILS (SHEET 3 OF 3)



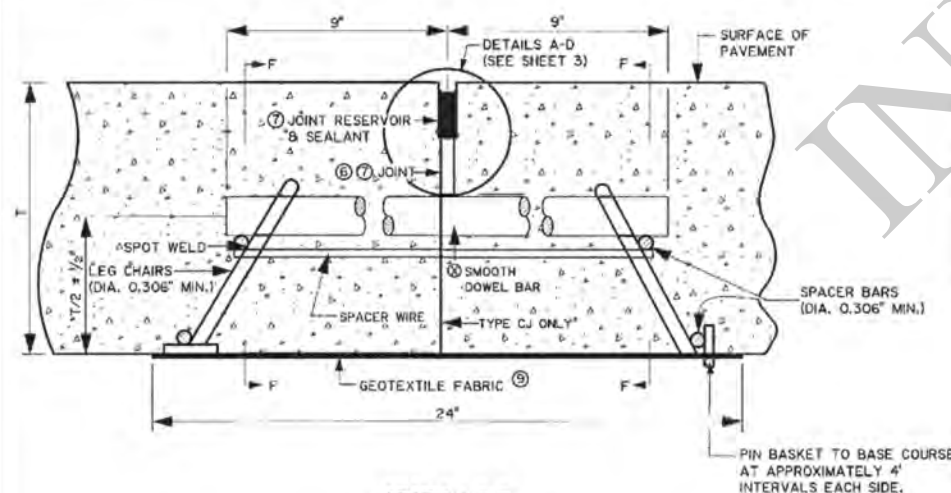
SECTION A-A
TYPE EJ-1 1/2"



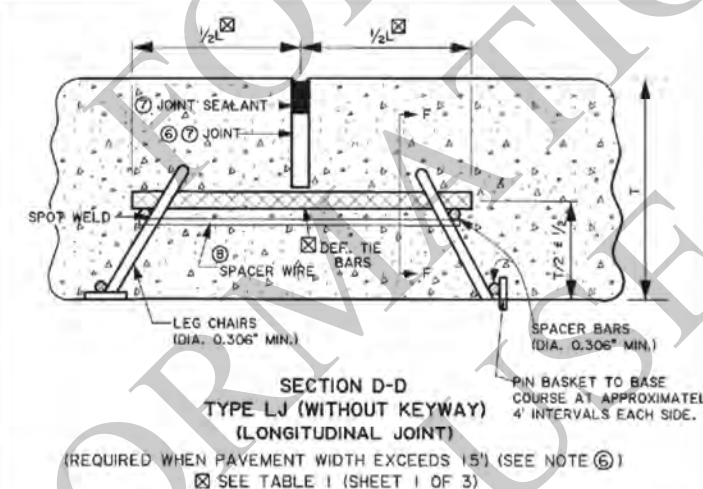
SECTION C-C
TYPE EJ-4" JOINT
AND SLEEPER SLAB



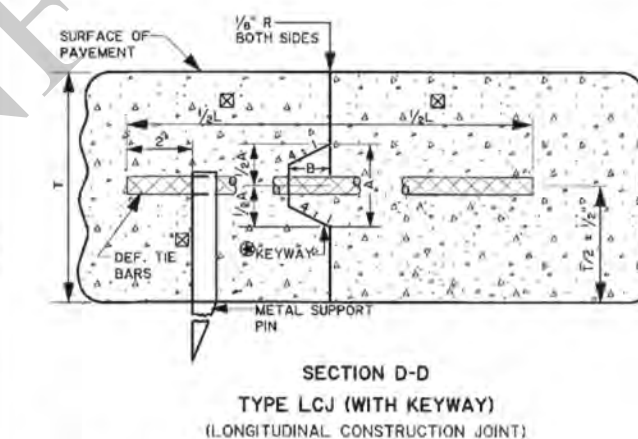
TYPE EJ ALTERNATE[®]
(TRANSVERSE EXPANSION JOINT)
(NOT ALLOWED FOR DESIGN SPEED > 45 MPH)
SEE TABLE 1 (SHEET 1 OF 3)



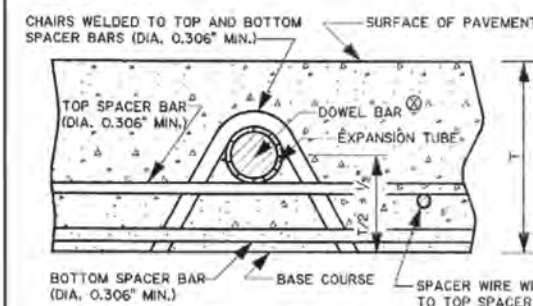
SECTION B-B
TYPE TCJ OR CJ[®]
(TRANSVERSE CONTRACTION JOINT OR CONSTRUCTION JOINT)
SEE TABLE 1 (SHEET 1 OF 3)



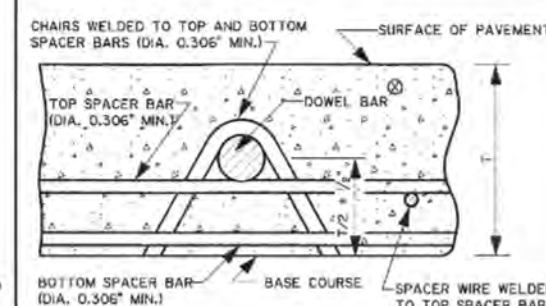
SECTION D-D
TYPE LJ (WITHOUT KEYWAY)
(LONGITUDINAL JOINT)
(REQUIRED WHEN PAVEMENT WIDTH EXCEEDS 15') (SEE NOTE 6)
SEE TABLE 1 (SHEET 1 OF 3)



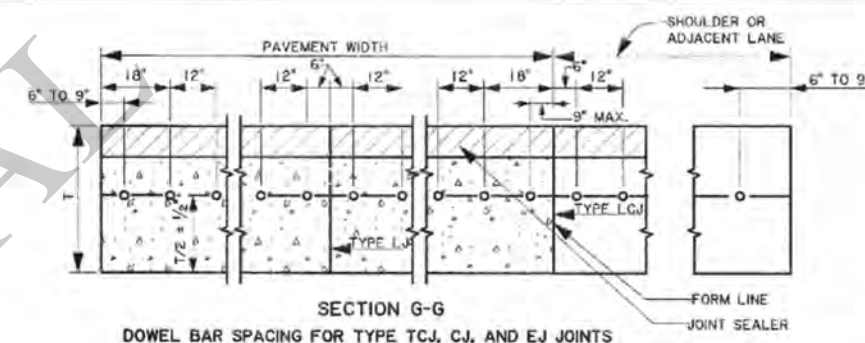
- FOR KEYWAY DIMENSIONS A & B SEE TABLE 1. IN LIEU OF THE KEYWAY, ONE OF THE FOLLOWING OPTIONS WILL BE ALLOWED:
- A. INSTALL TIE BARS OF THE SIZE SHOWN IN TABLE 1, AT 1/2 THE SPACING.
 - B. INSTALL TIE BARS 1/4" LARGER THAN THE TIE BAR DIAMETER SHOWN IN TABLE 1, AT THE SAME SPACING.
- SEE TABLE 1 (SHEET 1 OF 3)



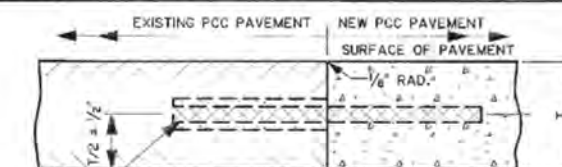
SECTION E-E
SEE TABLE 1 (SHEET 1 OF 3)



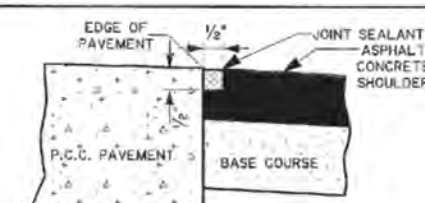
SECTION F-F
SEE TABLE 1 (SHEET 1 OF 3)



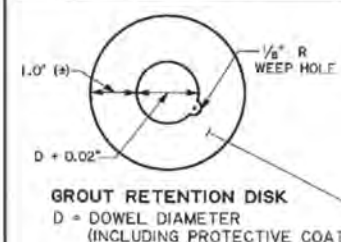
SECTION G-G
DOWEL BAR SPACING FOR TYPE TCJ, CJ, AND EJ JOINTS



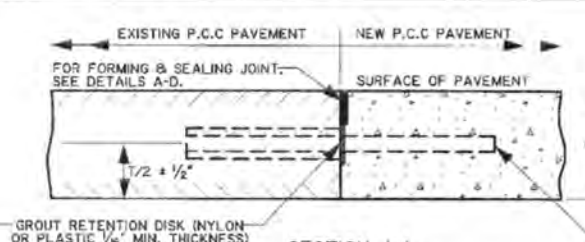
- SECTION H-H
TYPE LBJ
(LONGITUDINAL BUTT JOINT)
- DEFORMED TIE BARS OF THE SIZE, LENGTH AND ONE HALF THE SPACING SPECIFIED IN TABLE 1 SHALL BE USED. THE BARS SHALL BE INSTALLED IN EXISTING PAVEMENT BY DRILLING HOLES 1/8" LARGER THAN THE BAR DIAMETER TO A REQUIRED DEPTH OF 1/2 THE BAR LENGTH. THE HOLES SHALL BE DRILLED AND FILLED IN ACCORDANCE WITH SECTION 601 BEFORE INSERTION OF THE TIE BARS.



SECTION I-I
TYPE PJ
(HOT POURED SEALANT SECTION 1005)



GROUT RETENTION DISK
D = DOWEL DIAMETER
(INCLUDING PROTECTIVE COATING)



- SECTION J-J
TYPE BJ
(TRANSVERSE BUTT JOINT)
- SMOOTH DOWEL BARS OF THE SIZE, LENGTH AND SPACING SPECIFIED IN TABLE 1 SHALL BE USED. THE BARS SHALL BE INSTALLED IN EXISTING PAVEMENT BY DRILLING HOLES 1/8" LARGER THAN THE BAR DIAMETER TO A REQUIRED DEPTH OF 1/2 THE BAR LENGTH. THE HOLES SHALL BE DRILLED AND FILLED IN ACCORDANCE WITH SECTION 601 BEFORE INSERTION OF THE DOWEL BARS.

NOT TO SCALE

SHEET NUMBER 7		DATE		STATE PROJECT	
DESIGN	T. LAM	CHECK	D. SMITH	IN CHARGE	T. LAM
BY	T. LAM	DATE	10/13/2021	APPROVED BY	DAVID S. SMITH
				PROFESSIONAL ENGINEER	
				IN CIVIL ENGINEERING	
				10/11/21	
PORTLAND CEMENT CONCRETE PAVEMENT DETAILS					
DOTD					
LOUISIANA DEPARTMENT OF TRANSPORTATION & INFRASTRUCTURE					
ROAD DESIGN					

A cross-sectional diagram of a concrete joint repair. A vertical crack in a concrete wall is filled with a repair material. The repair material is composed of two parts: a top layer labeled 'JOINT SEALANT' and a bottom layer labeled 'BACKER MATERIAL'. The 'JOINT SEALANT' layer has a thickness of $\frac{1}{4}'' \pm \frac{1}{8}''$. The 'BACKER MATERIAL' layer has a thickness of $\frac{3}{4}'' \pm \frac{1}{4}''$. The total depth of the repair is $1 \frac{1}{4}'' \pm \frac{1}{8}''$. The concrete wall has a thickness of $1 \frac{1}{2}''$. The diagram also shows a 'SAWCUT' on the top surface of the concrete wall, with a width of $\frac{3}{4}'' \pm \frac{1}{4}''$.

Diagram illustrating the cross-section of a curb and gutter assembly. The diagram shows a curb with a 3/4" expansion joint filler (see detail "F") and a catch basin (CB-07, CB-08 or CB-09 or similar) that extends into the pavement. The back of the curb is shown, and the face of the curb is indicated. A transverse joint is shown in the pavement. The catch basin is shown with a grid pattern. The diagram also shows a 24" to 30" dimension and a note "REFER TO TABLE 1".

3"
3"
3/4" RADIUS
#3 BAR
3/4"

Diagram illustrating the cross-section of a curb and gutter. The diagram shows a 2' curb and gutter section. The total width of the curb is 12". The curb height is 6". The gutter depth is 6". The curb is reinforced with 3 #4 bars. The bars are spaced 9" apart. The curb has a 3/4" radius. The gutter has a 3/4" radius. The gutter is reinforced with #4 1/2" bars on 24" centers. The diagram also shows a 2' curb and gutter section.

The diagram shows a cross-section of a pavement structure. It consists of three main layers: a top layer labeled 'PAVEMENT', a middle layer labeled 'PCC SHOULDER', and a bottom layer labeled 'SLEEPER SLAB'. A dashed line represents the 'STANDARD' profile, which is shown as a sloped surface on the right side of the structure.

SHEET NUMBER									
		DESIGN		T. LAM		PARISH			
		CHECK		D. SMITH					
		DETAIL		T. LAM		CONTRACT SECTION			
		EFFECT		D. SMITH					
		REVIEW				STATE			
		REVISIONS		3 OF 3		PROJECT			



DAVID S. SMITH
LICENSE NO. 2085
PROFESSIONAL ENGINEER
IN
CIVIL ENGINEERING

David S. Smith
10/11/21



APPROVED BY CHIEF ENGINEER

Charles P. Hargis
10/13/2021



PORTLAND CEMENT CONCRETE
PAVEMENT DETAILS

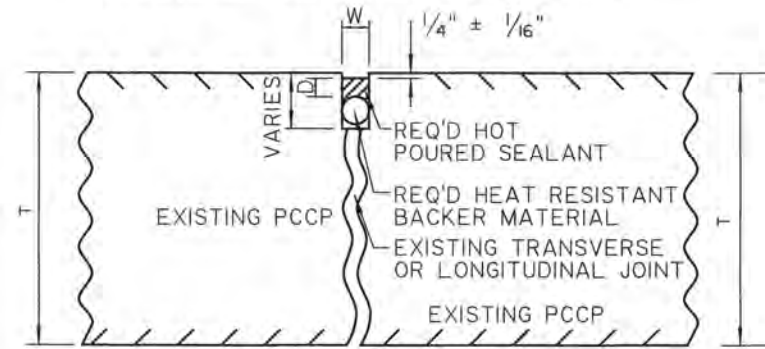
STANDARD CP-01



LOUISIANA DEPARTMENT OF
TRANSPORTATION & DEVELOPMENT

ROAD DESIGN

CLEANING AND RESEALING EXISTING TRANSVERSE AND LONGITUDINAL JOINTS



SECTION VIEW

TRANSVERSE JOINTS

WIDTH (W)	DEPTH (D)	BACKER MATERIAL (DIAMETER)	MINIMUM DEPTH TO REMOVE INCOMPRESSIBLES
1/2" - 1"	1/2"	W + 25%	T/2
1" - 1 1/2"	W/2	W + 25%	T

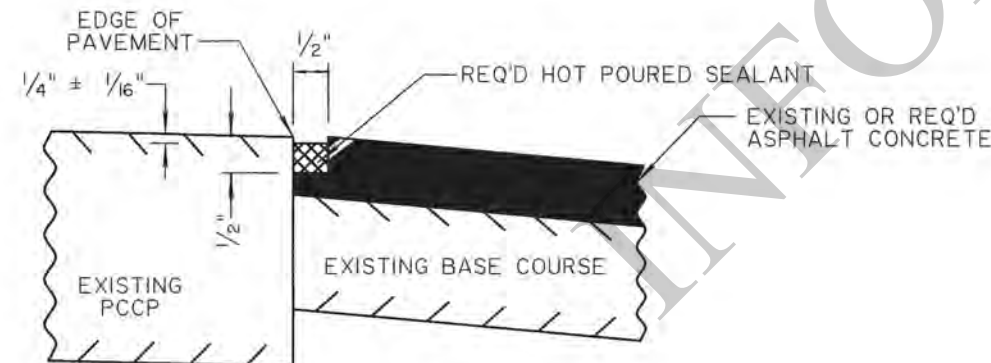
LONGITUDINAL JOINTS

WIDTH (W)	DEPTH (D)	BACKER MATERIAL (DIAMETER)	MINIMUM DEPTH TO REMOVE INCOMPRESSIBLES
3/8" - 1"	1/2"	W + 25%	T/2
1" - 1 1/2"	W/2	W + 25%	T

NOTES:

- HOT POURED SEALANT SHALL CONFORM TO SECTION 602.05 OF THE STANDARD SPECIFICATIONS.
- BACKER MATERIAL SHALL CONSIST OF HEAT RESISTANT, CLOSED-CELL, CROSS-LINKED POLYETHYLENE OR POLYOLEFIN FOAM.
- ALL WORK ON THIS DETAIL TO BE PAID FOR UNDER ITEM LABELED: CLEANING AND RESEALING EXISTING TRANSVERSE PAVEMENT JOINTS, OR CLEANING AND RESEALING EXISTING LONGITUDINAL PAVEMENT JOINTS.
- DETAIL NOT TO SCALE.

LONGITUDINAL SHOULDER JOINTS

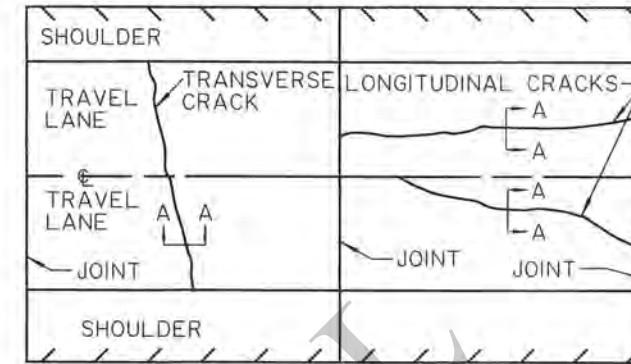


SECTION VIEW

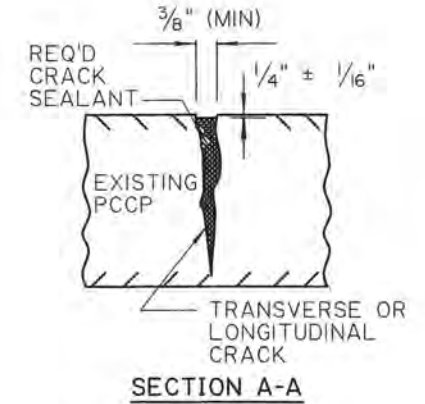
NOTES:

- HOT POURED SEALANT SHALL CONFORM TO SECTION 602.05 OF THE STANDARD SPECIFICATIONS.
- ALL WORK ON THIS DETAIL TO BE PAID FOR UNDER THE ITEM LABELED: LONGITUDINAL SHOULDER JOINTS.
- DETAIL NOT TO SCALE.

CLEANING AND SEALING RANDOM CRACKS



PLAN VIEW

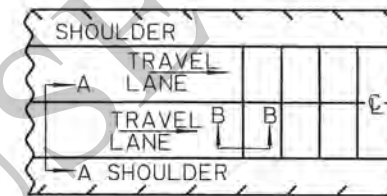


SECTION A-A

NOTES:

- APPLIES TO RANDOM CRACKS GREATER THAN 3/8" IN WIDTH ON JOINTED PCCP.
- CRACK SEALING LIMITS SHALL BE AS DIRECTED BY THE PROJECT ENGINEER.
- SEALANT FOR TRANSVERSE CRACKS SHALL CONFORM TO 602.05 OF THE STANDARD SPECIFICATIONS.
- SEALANT FOR LONGITUDINAL CRACKS SHALL BE LOW MODULUS TYPE I GRADE A EPOXY RESIN SYSTEM OR SILICONE.
- ALL WORK ON THIS DETAIL TO BE PAID FOR UNDER ITEM LABELED: CLEANING AND SEALING RANDOM CRACKS.
- DETAIL NOT TO SCALE.

SAWING AND SEALING JOINTS IN ASPHALT CONCRETE OVERLAY

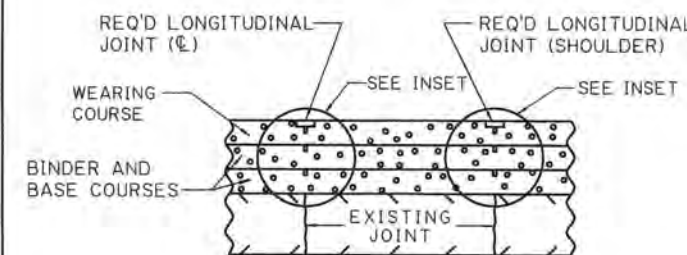


PLAN VIEW

RESERVOIR DIMENSIONS

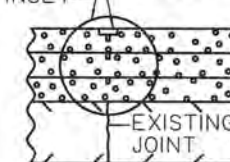
SLAB LENGTH	W
50' OR LESS	1/2"
51' OR GREATER	5/8"

HOT POURED SEALANT SHALL CONFORM TO SECTION 602.05 OF THE STD. SPECS.



SECTION A-A

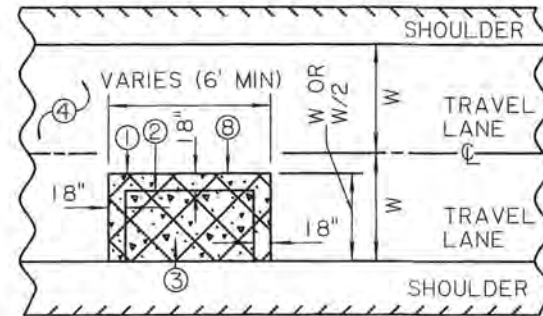
SEE INSET REQ'D TRANSVERSE JOINT



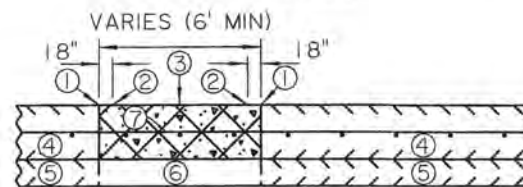
SECTION B-B

NOTES:

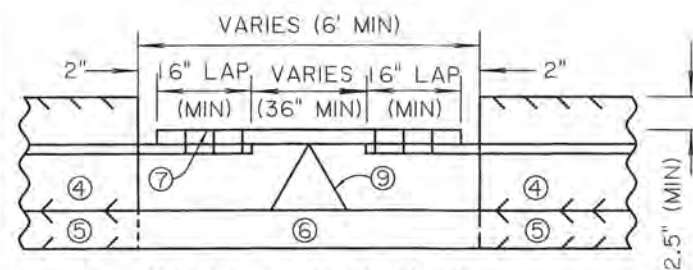
- SAWCUTS IN ASPHALT CONCRETE LIFTS (X) TO BE PAID FOR UNDER ITEM LABELED: SAWCUTS IN ASPHALT CONCRETE LIFTS.
- SAWING AND SEALING JOINTS IN ASPHALT CONCRETE OVERLAY (O) TO BE PAID FOR UNDER ITEMS LABELED: SAWING AND SEALING LONGITUDINAL JOINTS IN ASPHALT CONCRETE OVERLAY, OR SAWING AND SEALING TRANSVERSE JOINTS IN ASPHALT CONCRETE OVERLAY.
- DETAIL NOT TO SCALE.



PLAN VIEW



SECTION VIEW



STEEL LAP DETAIL

PATCHING CRCP

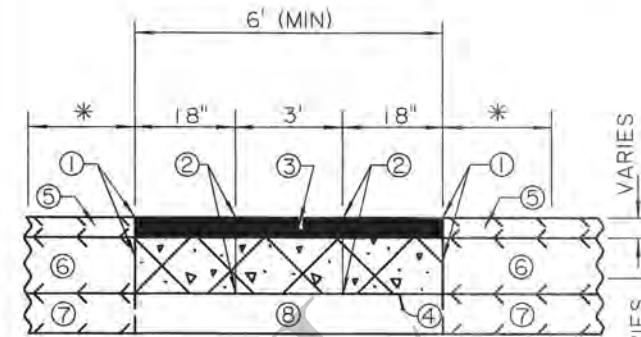
LEGEND

- ① PARTIAL DEPTH SAW CUT (1 1/2" MINIMUM DEPTH).
- ② FULL DEPTH SAW CUT.
- ③ CONTINUOUSLY REINFORCED CONCRETE PAVEMENT TO BE REMOVED AND REPLACED.
- ④ EXISTING CONTINUOUSLY REINFORCED CONCRETE PAVEMENT TO REMAIN.
- ⑤ EXISTING BASE COURSE TO REMAIN.
- ⑥ DETERIORATED BASE COURSE TO BE REMOVED AND REPLACED WITH CONCRETE WITHIN PATCHING LIMITS.
- ⑦ LONGITUDINAL AND TRANSVERSE STEEL TO BE REPLACED WITH THE SAME SIZE AND GRADE AS EXISTING STEEL.
- ⑧ CONCRETE IN THE SPLICE SECTION SHALL BE REMOVED IN SUCH A MANNER THAT THE EXISTING STEEL IS NOT DAMAGED OR BENT IN ANY DIRECTION.
- ⑨ THE MAXIMUM SPACING OF SUPPORTING CHAIRS SHALL BE 48".

NOTES:

1. TRANSVERSE SAWCUTS SHALL BE ALLOWED ACROSS ONLY ONE LANE AT A TIME.
2. THE DESIRED CLEARANCE BETWEEN THE PARTIAL DEPTH SAW CUT AND THE NEAREST TRANSVERSE CRACK IS 18". A SHORTER DISTANCE MAY BE USED, BUT NOT LESS THAN 6".
2. ALL WORK ON THIS DETAIL TO BE PAID FOR UNDER ITEM LABELED: PATCHING CONTINUOUSLY REINFORCED CONCRETE PAVEMENT.
3. DETAIL NOT TO SCALE.

PATCHING CRCP WITH HMAC



SECTION VIEW

* AN 18" CLEARANCE BETWEEN THE PARTIAL DEPTH SAW CUT AND THE NEAREST TRANSVERSE CRACK IS DESIRED. A SHORTER DISTANCE MAY BE USED, BUT THE MINIMUM LENGTH MUST NOT BE LESS THAN 6".

NOTES:

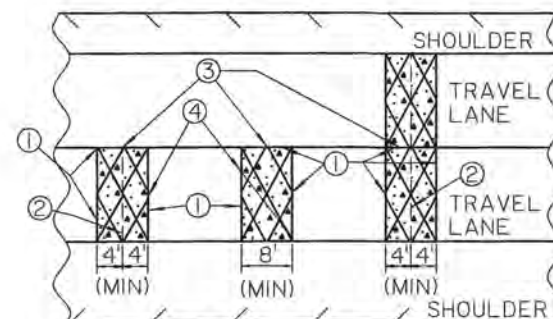
1. ALL WORK ON THIS DETAIL TO BE PAID FOR UNDER ITEM LABELED: PATCHING CONTINUOUSLY REINFORCED CONCRETE PAVEMENT.
2. DETAIL NOT TO SCALE.

LEGEND

- ① FULL DEPTH SAW CUT THROUGH EXISTING ASPHALT CONCRETE WITH PARTIAL DEPTH SAW CUT THROUGH CRCP (1 1/2" to 2").
- ② FULL DEPTH SAW CUT THROUGH EXISTING ASPHALT CONCRETE AND CRCP.
- ③ EXISTING ASPHALT CONCRETE TO BE REMOVED AND REPLACED. (COURSES AND TYPES TO BE AS SHOWN ON THE TYPICAL SECTION).
- ④ CRCP TO BE REMOVED AND REPLACED (SEE PATCHING CRCP DETAILS).
- ⑤ EXISTING ASPHALT CONCRETE TO REMAIN.
- ⑥ EXISTING CRCP TO REMAIN.
- ⑦ EXISTING BASE COURSE TO REMAIN.
- ⑧ DETERIORATED BASE COURSE TO BE REMOVED AND REPLACED WITH CONCRETE WITHIN THE PATCHING LIMITS.

PATCHING JOINTED PCCP

FULL WIDTH PANEL PATCH



PLAN VIEW

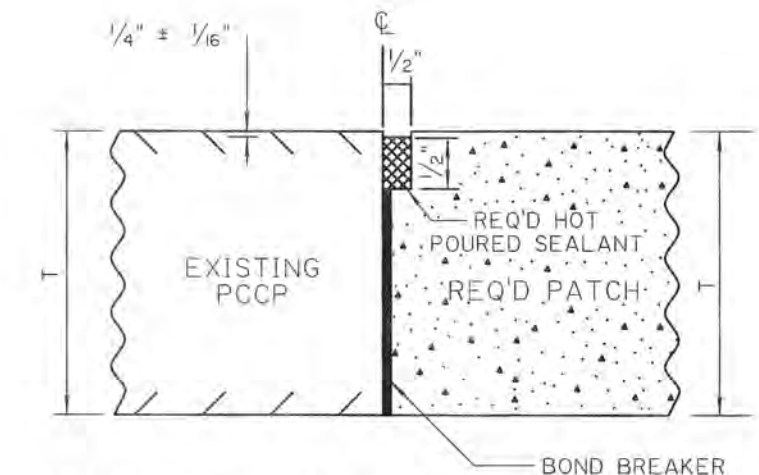
LEGEND

- ① FULL DEPTH SAW CUT.
- ② REQUIRED AND EXISTING JOINT.
- ③ REQUIRED JOINT.
- ④ REQUIRED CONSTRUCTION JOINT.

NOTES:

1. FOR ALL PATCHES <10 FEET IN LENGTH, PLACE A BOND BREAKER IN THE LONGITUDINAL JOINT OF THE ADJACENT SLAB(S).
2. FOR PATCHES >10 FEET IN LENGTH THAT DO NOT CONTAIN A TRANSVERSE JOINT WITHIN THE PATCH, PLACE TIE BARS IN THE ADJACENT SLAB(S) ALONG THE LONGITUDINAL JOINT.
3. FOR PATCHES >10 FEET IN LENGTH WHERE A TRANSVERSE JOINT IS LOCATED WITHIN THE PATCH, PLACE TIE BARS IN THE ADJACENT SLAB(S) IN THE LONGER PORTION ALONG THE LONGITUDINAL JOINT (WITH RESPECT TO THE EXISTING TRANSVERSE JOINT) AND PLACE A BOND BREAKER IN THE REMAINING SHORTER PORTION OF THE LONGITUDINAL JOINT. FOR THOSE CASES WHERE THE PATCH IS EVENLY SPACED ACROSS THE TRANSVERSE JOINT, PLACE TIE BARS ALONG THE LONGITUDINAL JOINT ON THE LEADING SIDE EDGE OF THE ADJACENT SLAB(S) WITH RESPECT TO TRAFFIC.
4. REMOVE AND REPLACE DETERIORATED BASE COURSE WITH CONCRETE WITHIN THE PATCHING LIMITS. A BOND BREAKER IS REQUIRED BETWEEN THE BASE AND PAVEMENT.
5. THE RECOMMENDED MAXIMUM LENGTH-TO-WIDTH RATIO FOR ALL PCCP PATCHES IS 1.5 (L) TO 1 (W) BETWEEN JOINTS.
6. FOR TRANSVERSE BUTT JOINTS, USE 1" DIAMETER (#8) DOWEL BAR FOR SLAB THICKNESS 8" TO 10" AND 1.25" DIAMETER (#10) DOWEL BAR FOR SLAB THICKNESS >10" SPACED AT 12" CENTER TO CENTER. USE 18" LENGTHS FOR ALL TRANSVERSE BUTT JOINT DOWEL BARS. DRILL HOLES FOR DOWEL BARS INTO THE MIDDLE OF THE VERTICAL FACE OF EXISTING PAVEMENT. DRILL HOLES NO LARGER THAN 1/8" LARGER THAN THE DIAMETER OF THE BAR USED. FILL IN ACCORDANCE WITH SECTION 601 BEFORE INSERTION OF THE DOWEL BARS.
7. CONFORM TO SECTION 601 & CP-01 FOR JOINTS AND BAR SIZES, MATCHING EXISTING JOINT TYPE AND BAR SPACING WHERE POSSIBLE.
8. COAT EXISTING TRANSVERSE VERTICAL FACES WITH NEAT CEMENT JUST PRIOR TO POURING PATCH.
9. SAW AND SEAL ALL JOINTS.
10. PAYMENT FOR ALL WORK PERFORMED IN THIS DETAIL UNDER ITEM: FULL DEPTH PATCHING OF JOINTED CONCRETE PAVEMENT.
11. ANY DAMAGE OR SAWCUTS INTO ADJACENT PANELS SHALL BE PATCHED, AS SHOWN ON THIS PATCHING DETAIL, AT NO DIRECT PAY.
12. DETAIL NOT TO SCALE.

PATCHING JOINTED PCCP

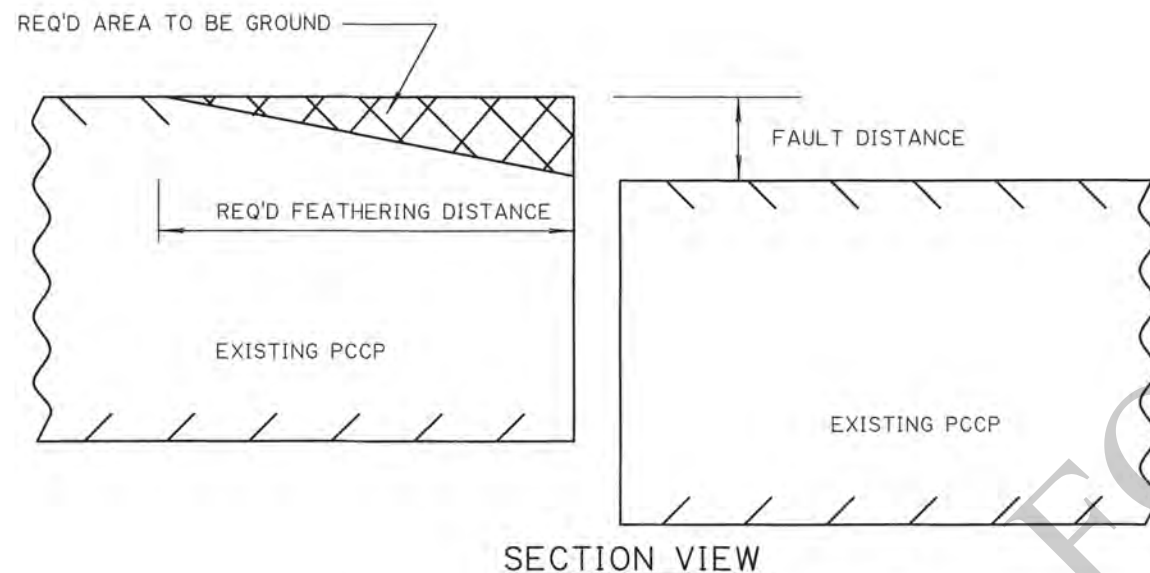


LONGITUDINAL JOINT SECTION VIEW (<10')

NOTES:

1. HOT POURED SEALANT SHALL CONFORM TO SECTION 602.05 OF THE STANDARD SPECIFICATIONS.
2. ALL WORK ON THIS DETAIL TO BE PAID FOR UNDER ITEM LABELED: FULL DEPTH PATCHING OF JOINTED CONCRETE PAVEMENT.
3. DETAIL NOT TO SCALE.

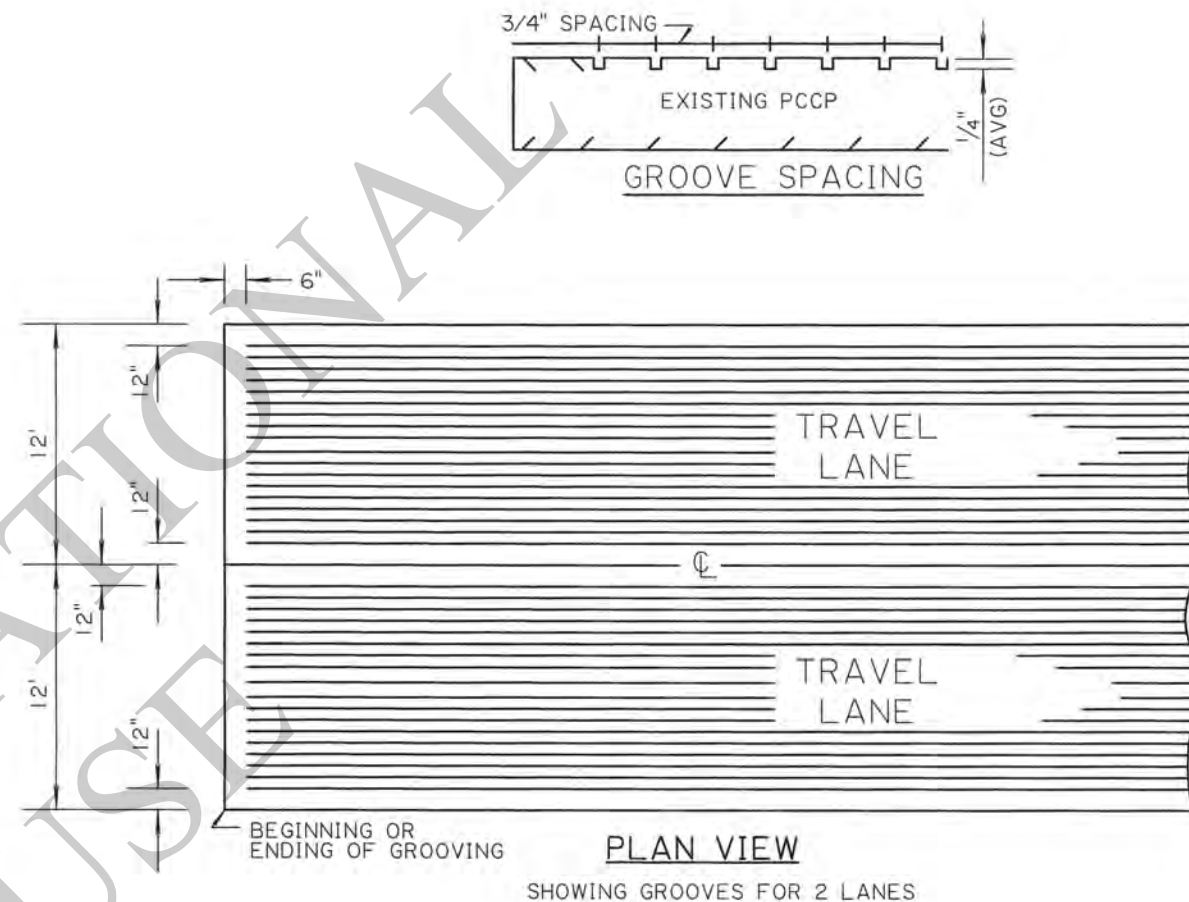
GRINDING ISOLATED TRANSVERSE JOINTS



FAULT DISTANCE	FEATHERING DISTANCE
1/4"	5'
3/8"	7.5'
1/2"	10'

- NOTES:
1. IF FAULT IS OVER 1/2", REMOVE AND REPLACE THE FAULTED AREA WITH A FULL DEPTH PATCH.
 2. ALL GRINDING TO BE DONE PRIOR TO JOINT SEALING.
 3. ALL WORK ON THIS DETAIL TO BE PAID FOR UNDER ITEM: MILLING CONCRETE PAVEMENT.
 4. DETAIL NOT TO SCALE.

PAVEMENT GROOVING



- NOTES:
1. ALL WORK ON THIS DETAIL SHALL BE PAID FOR UNDER ITEM: DIAMOND GROOVING CONCRETE PAVEMENT.
 2. DETAIL NOT TO SCALE.

SHEET NUMBER		PART		CONTROL SECTION		STATE PROJECT	
DESIGN	CHECK	DETAIL	CHECK	REVIEW	SERIES	OF 1	
B. MAY	J. LACOMBE	B. MAY	J. LACOMBE				

BRIAN A. MAY
License No. 40505
PROFESSIONAL ENGINEER
IN
CIVIL ENGINEERING
12/23/20

APPROVED BY CHIEF ENGINEER: *Chris P. Hays* DATE: 1/12/2021

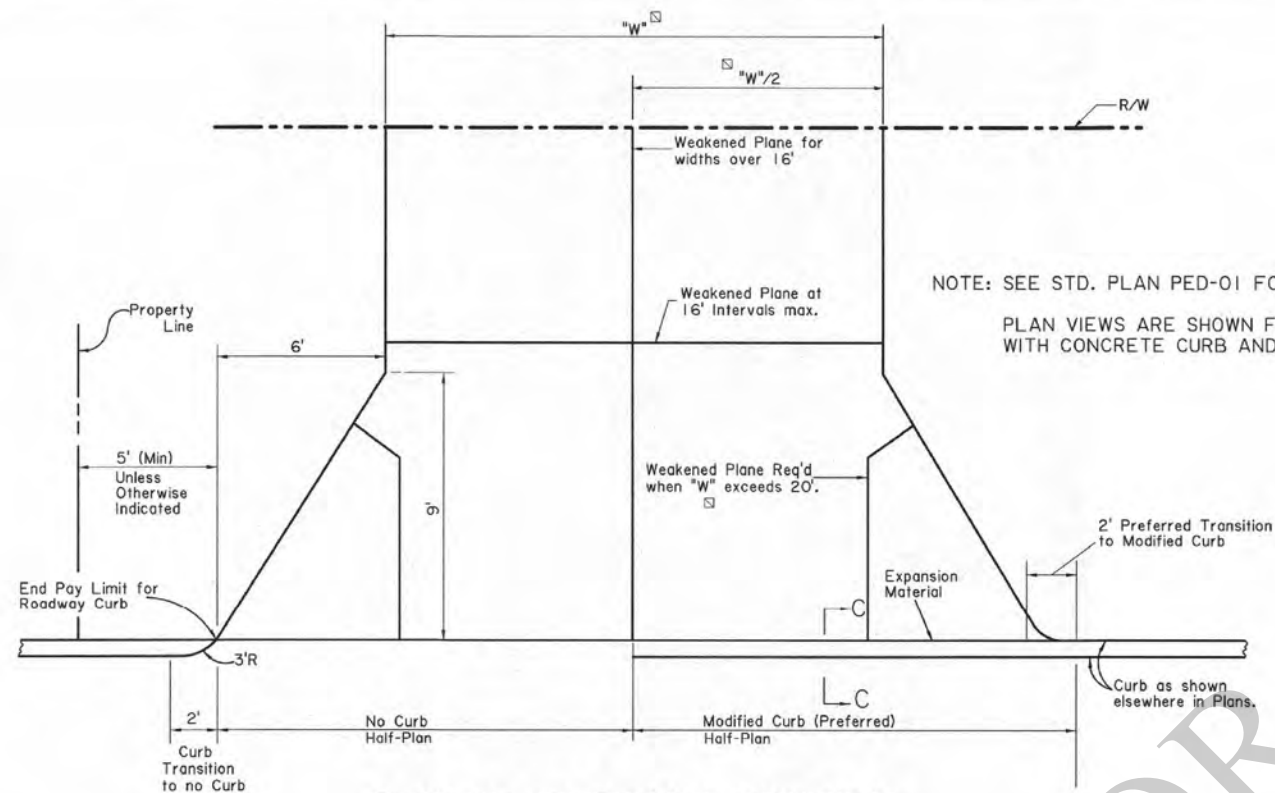
CHIEF ENGINEER
Chris P. Hays
License No. 40505
PROFESSIONAL ENGINEER
IN
CIVIL ENGINEERING
12/23/20

CONCRETE REHAB DETAILS

CPR-03

DOTD
LOUISIANA DEPARTMENT OF
TRANSPORTATION & DEVELOPMENT

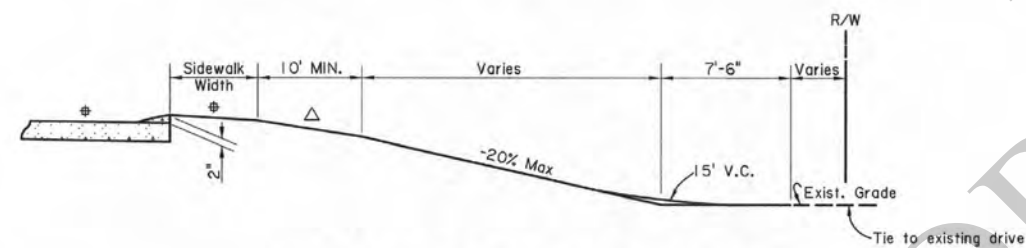
ROAD DESIGN



NOTE: MODIFIED CURB TO BE PAID FOR AS CURB AND WILL BE USED AS SHOWN
IN THE PLANS OR WHEN DIRECTED BY THE PROJECT ENGINEER.

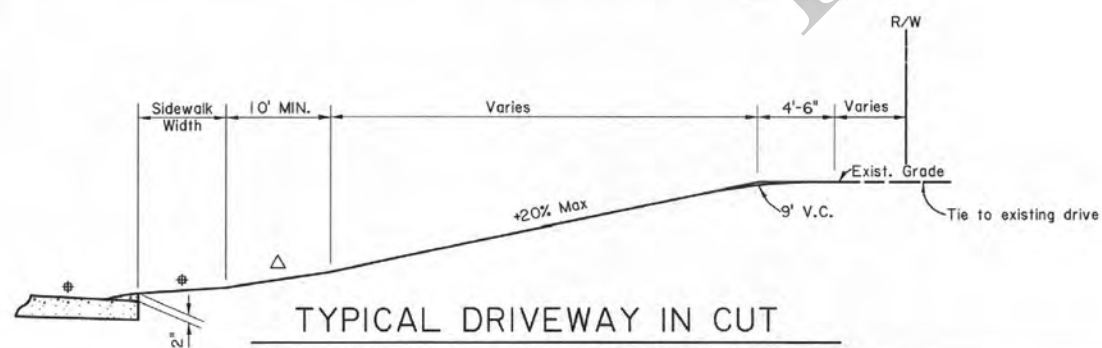
RADII TRANSITION SHAPE MAY BE USED IN LIEU OF A FLARE.

☐ "W" = Width as per plans



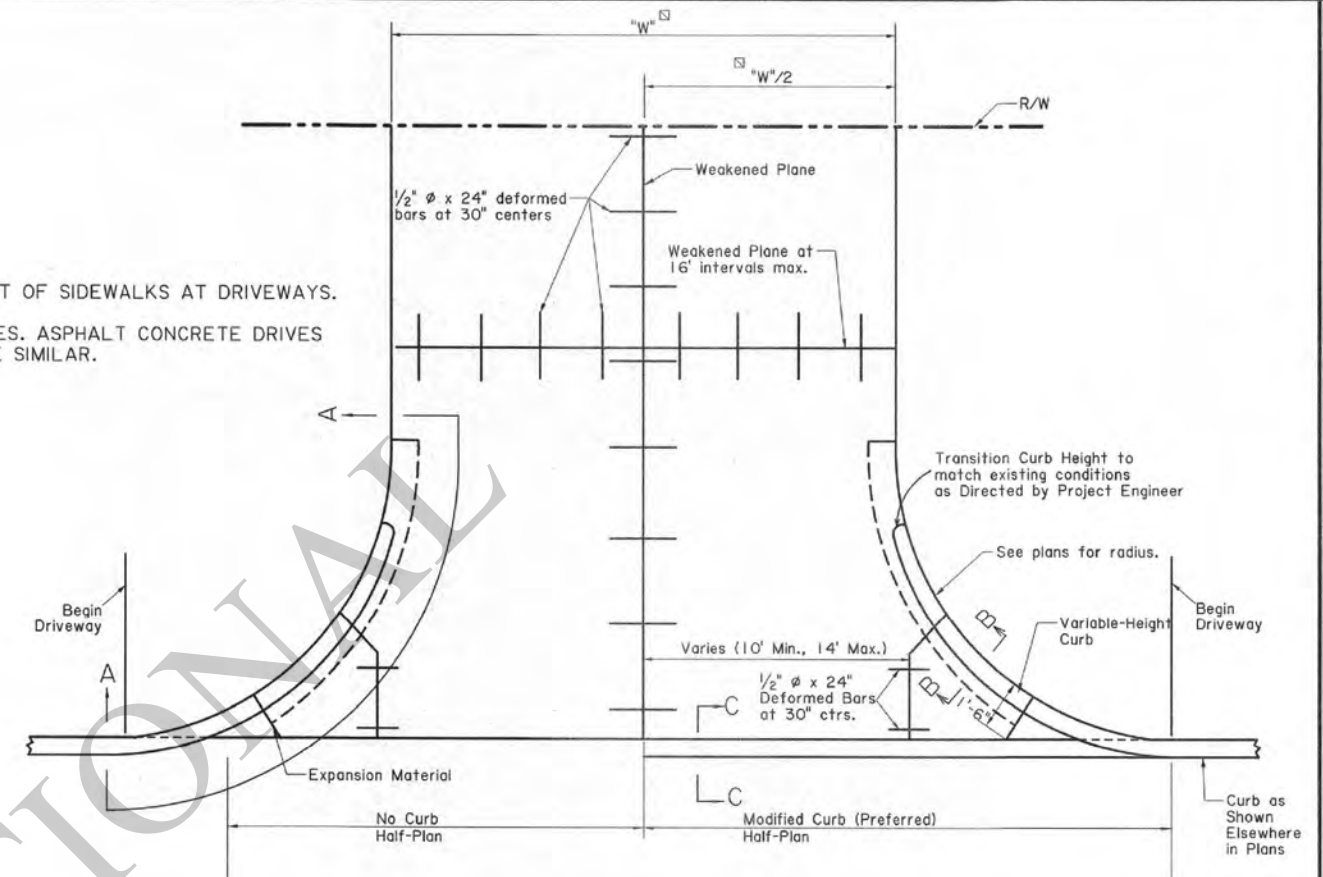
NOTES:

1. DRIVEWAY PROFILES SHOWN ASSUME A SIDEWALK ADJACENT TO THE CURB.
- △ 2. MAXIMUM DRIVEWAY GRADE SHALL BE 20% (25% FOR SPECIAL CASES). MAXIMUM BREAK IN GRADE WITHOUT A VERTICAL CURVE SHALL BE 10% FOR CRESTS AND 9% FOR SAGS, AT NOT LESS THAN 10' INTERVALS.
- ⊕ 3. ROADWAY AND SIDEWALK SLOPES VARY AS PER PLANS.



NOTE: SEE STD. PLAN PED-01 FOR TREATMENT OF SIDEWALKS AT DRIVEWAYS.

PLAN VIEWS ARE SHOWN FOR PCC DRIVES. ASPHALT CONCRETE DRIVES WITH CONCRETE CURB AND GUTTER ARE SIMILAR.

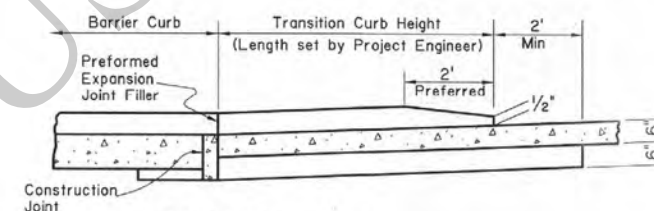


PLAN OF COMMERCIAL DRIVEWAY

NOTE: MODIFIED CURB TO BE PAID FOR AS CURB AND WILL BE USED AS SHOWN
IN THE PLANS OR WHEN DIRECTED BY THE PROJECT ENGINEER.

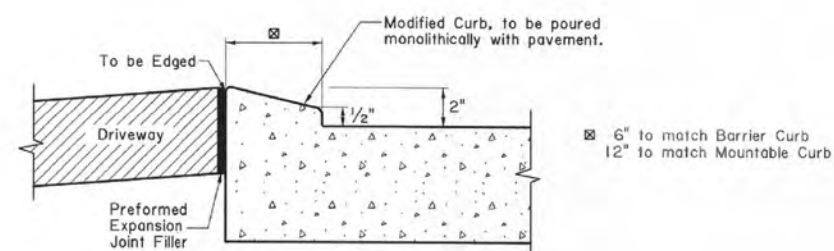
WHEN CURB IS REQUIRED ALONG RADII OF DRIVEWAY, PAYMENT FOR TOE WALL AND CURB WILL BE INCLUDED IN THE PRICE FOR DRIVEWAY ITEMS.

WHEN CURB IS NOT REQUIRED ALONG RADII, TRANSITION CURB AS SHOWN
ON RESIDENTIAL DRIVEWAY.



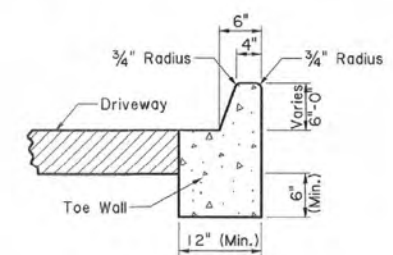
SECTION A-A

(Weakened Plane not shown.)



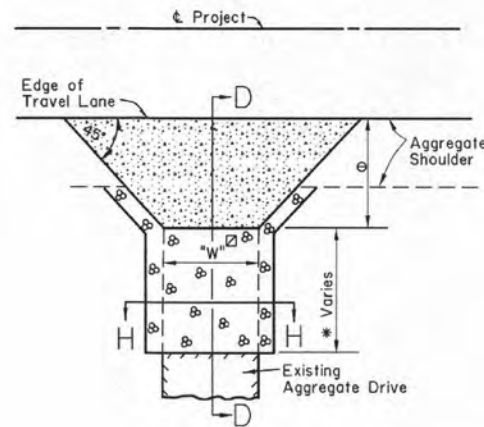
SECTION C-C

NOTE: See Std. Plan CP-01 for Curb construction



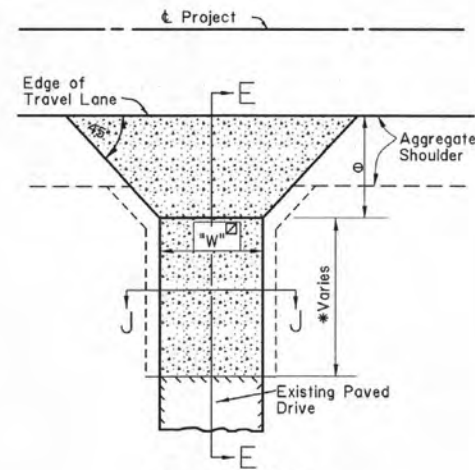
SECTION B-B

NOTE: For PCC Driveway, Curb, Toe Wall & Driveway to be poured monolithically.



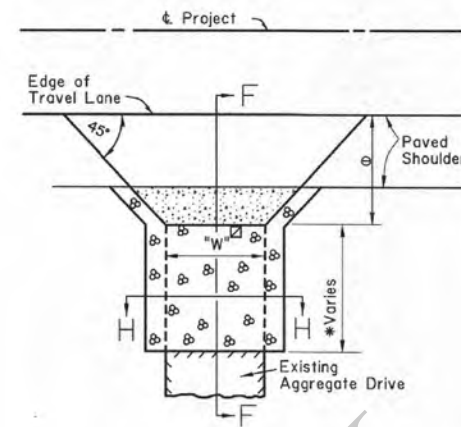
TYPE "A"

Paved Driveway Flare
Along Aggregate Shoulder



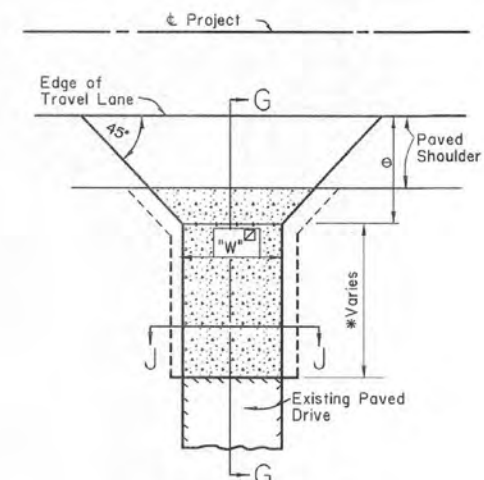
TYPE "B"

Paved Driveway Flare
Along Aggregate Shoulder
Connecting Existing Paved Drive



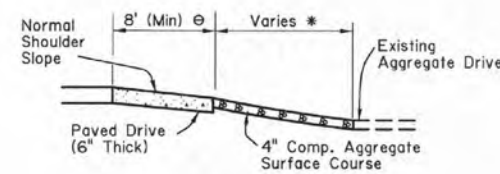
TYPE "C"

Paved Driveway Flare
Along Paved Shoulder

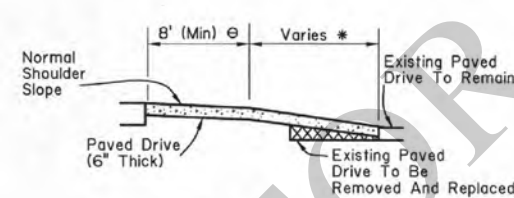


TYPE "D"

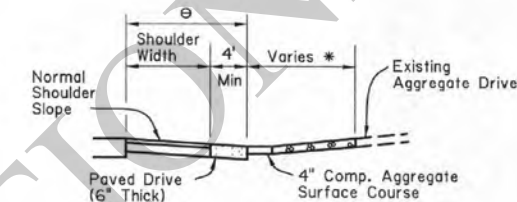
Paved Driveway Flare
Along Paved Shoulder
Connecting Existing Paved Drive



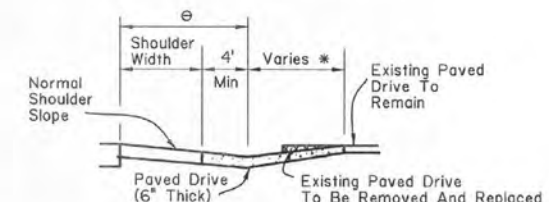
SECTION D-D



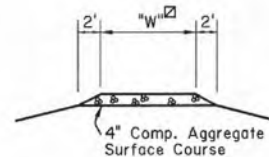
SECTION E-E



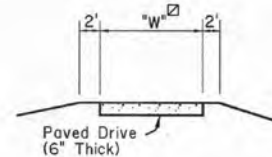
SECTION F-F



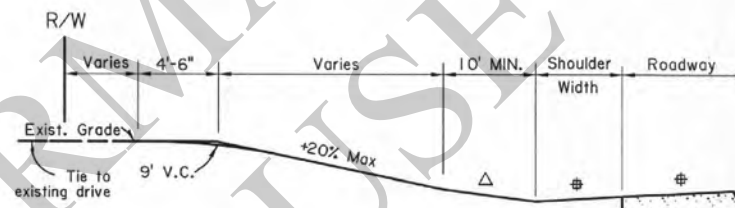
SECTION G-G



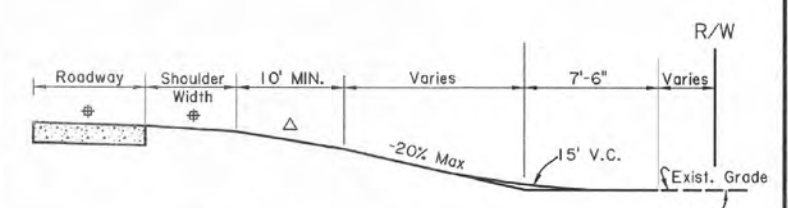
SECTION H-H



SECTION J-J



TYPICAL DRIVEWAY IN CUT



TYPICAL DRIVEWAY IN FILL

W = Width as per plans

NOTES:

1. PORTLAND CEMENT CONCRETE DRIVES WILL BE CONSTRUCTED TO REPLACE OR CONNECT TO EXISTING CONCRETE DRIVES.
- * 2. SEE PLANS: APPLIES WHERE EXISTING DRIVE IS TO BE REMOVED FOR ROADWAY CONSTRUCTION AND/OR TO ACHIEVE VERTICAL GEOMETRY REQUIREMENTS.
3. PAVEMENT SHALL EXTEND 8' MINIMUM FROM EDGE OF PAVED ROADWAY SURFACE (TRAVEL LANE) FOR SINGLE-FAMILY RESIDENTIAL/NON-COMMERCIAL AGRICULTURE TYPE CONNECTIONS, AND 25' FOR TRAFFIC GENERATOR (COMMERCIAL) TYPE CONNECTIONS, OR AS PER THE PLANS. PAVED DRIVEWAY FLARE SHALL EXTEND 4' MINIMUM FROM EDGE OF PAVED SHOULDER. RADII TRANSITION SHAPE MAY BE USED IN LIEU OF FLARE.
4. COMPACTION OF SUBGRADE AND GRADING WORK FOR CONSTRUCTION OF DRIVES SHALL BE SATISFACTORY TO THE ENGINEER AND PAYMENT SHALL BE INCLUDED IN THE DRIVEWAY ITEMS.
5. MAXIMUM DRIVEWAY GRADE SHALL BE 20% (25% FOR SPECIAL CASES). MAXIMUM BREAK IN GRADE WITHOUT A VERTICAL CURVE SHALL BE 10% FOR CRESTS AND 9% FOR SAGS, AT NOT LESS THAN 10' INTERVALS.
6. ROADWAY AND SHOULDER SLOPES VARY AS PER PLANS

LEGEND

- ASPHALT
- AGGREGATE
- REMOVAL

SHEET NUMBER		PARISH		CONTROL SECTION		STATE PROJECT	
P. TONEY		R. MC MILLAN		P. TONEY		R. MC MILLAN	
DESIGN		CHECK		DETAIL		CHECK	
REVIEW		D. SMITH		SERIES #		2 OF 3	

STATE OF LOUISIANA

AIDAN EYMARD

License No. 46220

PROFESSIONAL ENGINEER

IN

CIVIL ENGINEERING

Under Seal

8/2/2022

APPROVED BY CHIEF ENGINEER:

DATE: 8/4/2022

DRIVEWAYS ON NON-CURBED ROADWAYS

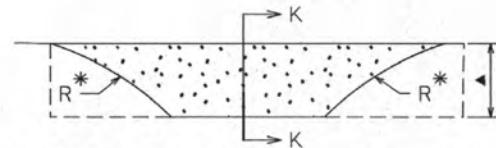
STANDARD PLAN DW-01

DOTD

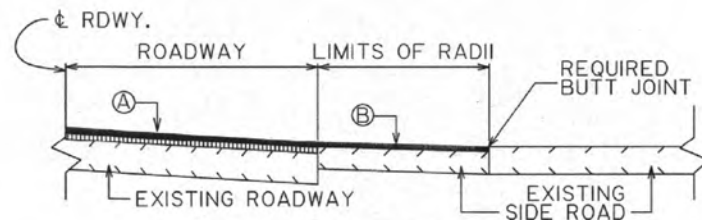
LOUISIANA DEPARTMENT OF TRANSPORTATION & DEVELOPMENT

STANDARD PLAN

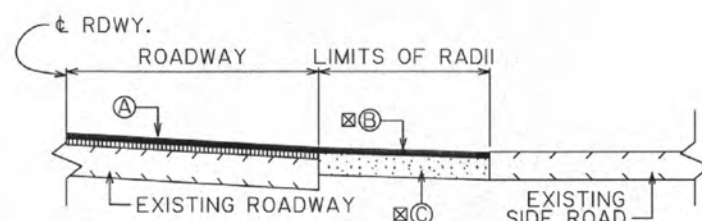
TURNOUT TIE-IN DETAILS
FOR OVERLAY PROJECTS



DETAIL OF APRON AT TURNOUT (TYPICAL)



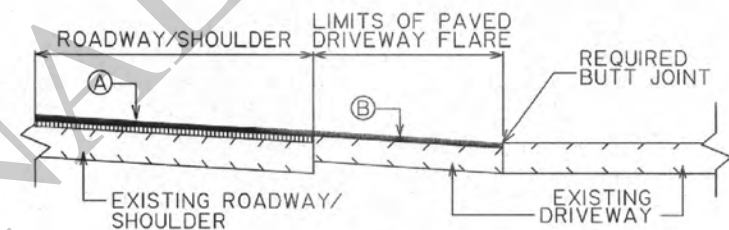
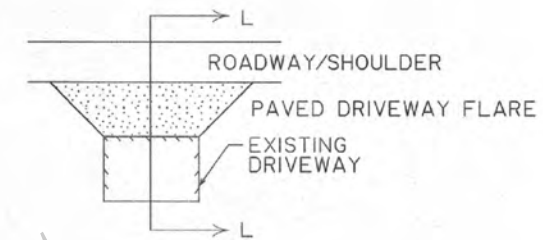
SECTION K-K (PAVED SIDE ROAD)



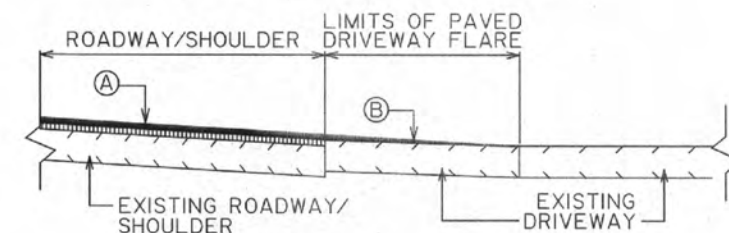
SECTION K-K (UNPAVED SIDE ROAD)

- Ⓐ ASPHALT CONCRETE (COURSES AND TYPES SHOWN ON ROADWAY TYPICAL SECTION)
- Ⓑ ASPHALT CONCRETE (THICKNESS SHALL MATCH ROADWAY WEARING SURFACE)
- ⓈⒸ ASPHALT CONCRETE BASE COURSE
- * MATCH EXISTING RADIUS
- ▲ VERTICAL TRANSITION FROM ROADWAY TO BUTT JOINT TIE-IN WHERE NEEDED
- Ⓢ TOTAL THICKNESS OF WEARING COURSE AND BASE COURSE SHALL BE A MINIMUM OF 6"

DRIVEWAY TIE-IN DETAILS
FOR OVERLAY PROJECTS



SECTION L-L (ALTERNATE 1)

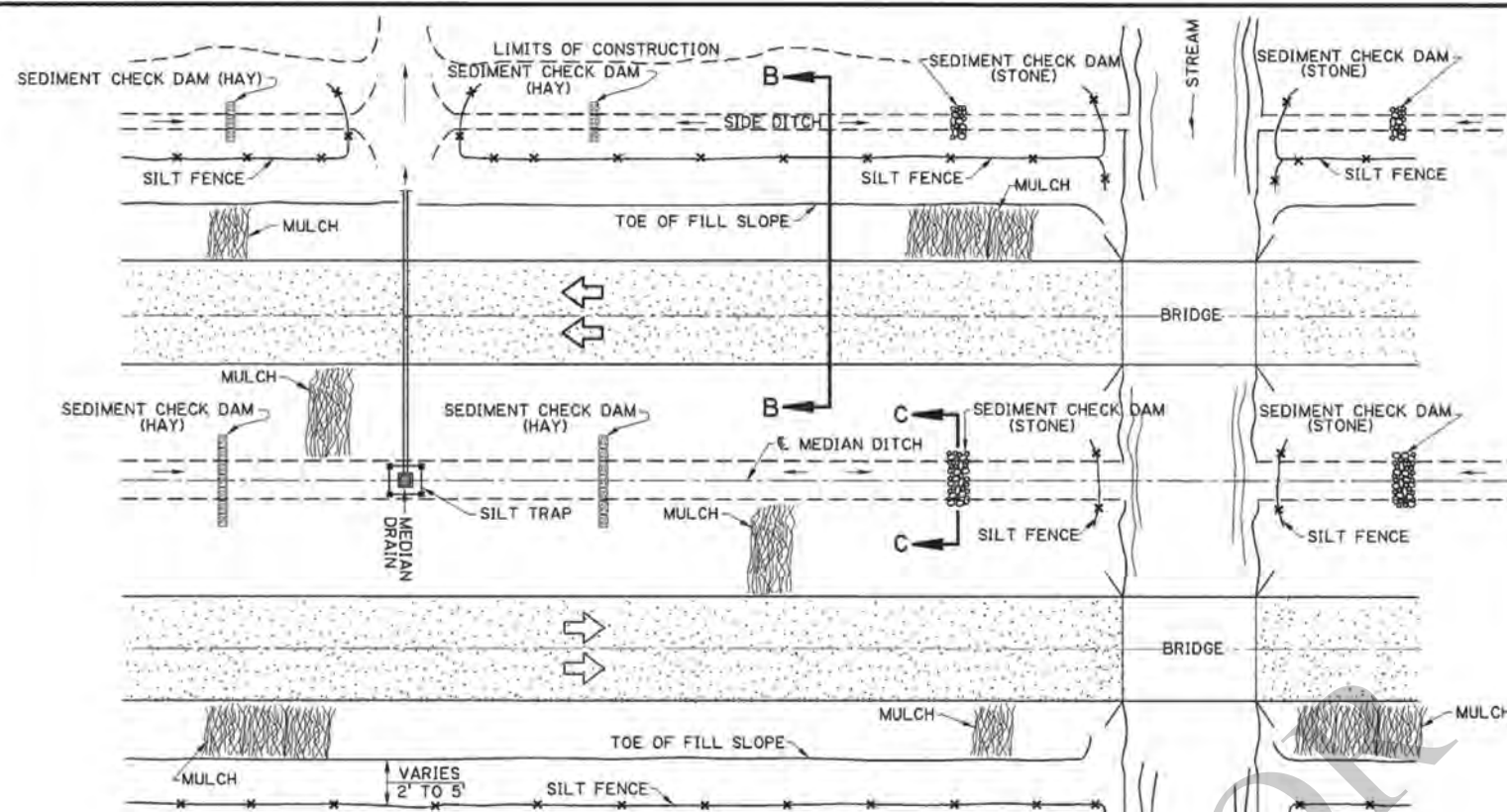


SECTION L-L (ALTERNATE 2)

- Ⓐ ASPHALT CONCRETE (COURSES AND TYPES SHOWN ON ROADWAY TYPICAL SECTION)
- Ⓑ ASPHALT CONCRETE (THICKNESS SHALL MATCH ROADWAY WEARING COURSE)

NOTES:

1. DRIVE WIDTHS AND FLARE DIMENSIONS TO BE ADJUSTED TO MATCH EXISTING CONDITIONS AS DIRECTED BY THE PROJECT ENGINEER.
2. TYPE OF TIE-IN AND LENGTH OF OVERLAY TRANSITION TO BE SET BY PROJECT ENGINEER TO ACHIEVE A SUITABLE CONNECTION FOR EXISTING DRIVE.
3. REFER TO SHEET 2 OF DW-01 FOR SUGGESTED TIE-IN CRITERIA OF STEEP GRADES.

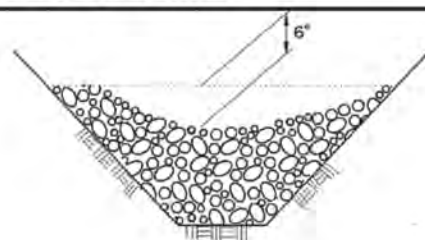


PLAN SHOWING TYPICAL TEMPORARY EROSION CONTROL

MULCHES

MULCHES ARE THE APPLICATION OF MATS OF MATERIAL PLACED ON THE SOIL SURFACE TO PREVENT EROSION BY PROTECTING THE SOIL SURFACE FROM RAINDROP IMPACT AND TO REDUCE THE VELOCITY OF OVERLAND FLOW. MULCHES CAN BE ORGANIC OR SYNTHETIC. MULCHES SHALL BE IN ACCORDANCE WITH PROJECT SPECIFICATIONS FOR TEMPORARY EROSION CONTROL. A FEW GUIDELINES FOR THE USE OF MULCHES ARE:

1. USE ON CUT AND EMBANKMENT SLOPES WHICH HAVE NOT BEEN COMPLETED TO PLAN GRADE OR WHERE THE WEATHER OR SOIL CONDITIONS WILL NOT PERMIT COMPLETING THEM WITHIN A REASONABLE TIME
2. USE ON CLEARED, GRUBBED , AND SCALPED AREAS WHERE SOIL EROSION IS LIKELY TO OCCUR
3. USE WITH TEMPORARY SEEDING



SECTION C-C

TEMPORARY SEDIMENT CHECK DAM (STONE)

PAY ITEM: TEMPORARY SEDIMENT CHECK DAM (STONE)

NOTES:

NOTE: A STONE CHECK DAM IS A SMALL TEMPORARY DAM CONSTRUCTED ACROSS A SWALE OR DRAINAGE DITCH. THE PURPOSE OF THIS MEASURE IS TO REDUCE THE VELOCITY OF CONCENTRATED STORM WATER FLOWS, THEREBY REDUCING EROSION OF THE SWALE OR DITCH. THE STONE CHECK DAM WILL TRAP SMALL AMOUNTS OF SEDIMENTS GENERATED IN THE DITCH ITSELF, HOWEVER IT SHOULD NOT BE USED AS A SEDIMENT TRAPPING DEVICE. A FEW BASIC DESIGN GUIDELINES FOR THE USE OF STONE CHECK DAMS ARE:

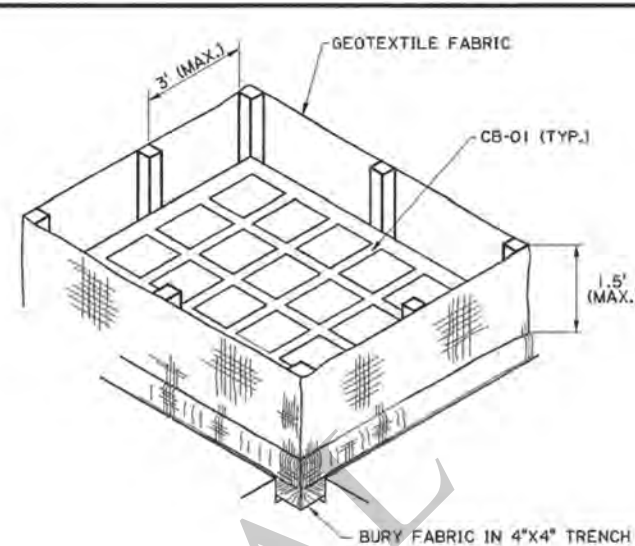
1. USE IN SMALL OPEN CHANNELS WHICH DRAIN 10 ACRES OR LESS
2. DO NOT USE IN A LIVE STREAM
3. USE IN A TEMPORARY DITCH OR SWALE WHICH, BECAUSE OF THEIR SHORT LENGTH OF SERVICE, CANNOT RECEIVE A NON- ERODIBLE LINING
4. USE IN PERMANENT DITCHES OR SWALES WHICH WILL NOT RECEIVE A PERMANENT LINING FOR AN EXTENDED PERIOD OF TIME
5. USE IN TEMPORARY OR PERMANENT DITCHES OR SWALES WHICH NEED PROTECTION DURING THE ESTABLISHMENT OF GRASS LININGS
6. FOR STONE SPECIFICATIONS, SEE PROJECT SPECIFICATIONS FOR RIPRAP. (CLASS 2 LB)



SECTION B-B

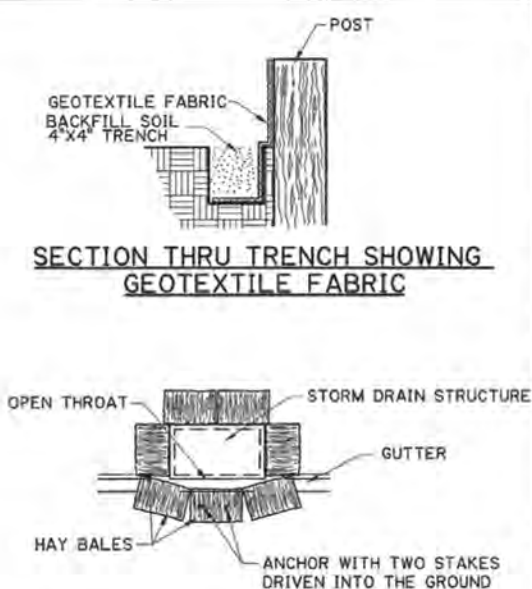
TEMPORARY SILT FENCE APPLICATION

(FOR CONSTRUCTION DETAILS AND SPECIFICATIONS SEE SHEET 2 OF 2.)



ISOMETRIC VIEW SHOWING
GEOTEXTILE FABRIC

(BACKFILL SOIL NOT SHOWN)



SECTION THRU TRENCH SHOWING
GEOTEXTILE FABRIC

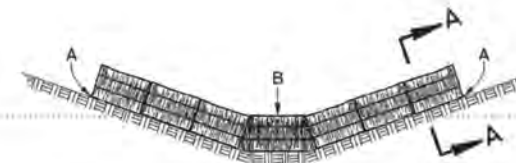
PLAN SHOWING HAY BALES

PAY ITEM: TEMPORARY HAY OR STRAW BALES

TEMPORARY INLET SILT TRAP

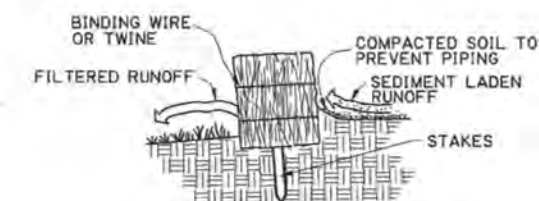
THE TEMPORARY DROP INLET SILT TRAP IS TO BE USED FOR SMALL DRAINAGE AREAS (LESS THAN 1 ACRE) WHERE THE STORM DRAIN IS FUNCTIONAL BEFORE THE AREA IS STABILIZED. THE TRAP CAN BE EITHER GEOTEXTILE FABRIC OR HAY BALES.

1. THE GEOTEXTILE FABRIC SHALL CONFORM TO PROJECT SPECIFICATIONS FOR GEOTEXTILE FABRIC (CLASS G).
2. WOODEN STAKES SUPPORTING THE FABRIC SHALL BE 2" X 2" OR 2" X 4" WITH A MINIMUM LENGTH OF 3 FEET. THE STAKES SHALL BE SPACED AROUND THE INLET AT A MAXIMUM SPACING OF 3 FEET.
3. THE HEIGHT OF THE FABRIC ABOVE THE INLET SHALL BE LIMITED TO 1.5' AND THE BOTTOM OF THE FABRIC SHALL BE BURIED IN A TRENCH APPROXIMATELY 4" WIDE BY 4" DEEP. THE FABRIC SHALL BE STAPLED TO THE POST WITH 1/2" STAPLES.
4. THE TRAP SHOULD BE INSPECTED REGULARLY AND AFTER EACH STORM. THE SEDIMENT SHOULD BE REMOVED AND EACH STAKE SHOULD BE FIRMLY IN THE GROUND.
5. HAY BALES SHALL BE PLACED SO THAT THE BINDING WIRE OR TWINE IS NOT IN CONTACT WITH THE GROUND.



POINTS A SHOULD BE HIGHER THAN POINT B.

ELEVATION



SECTION A-A

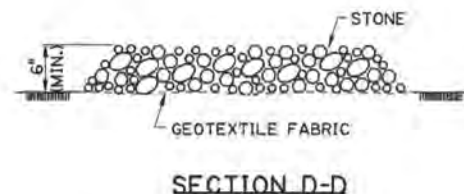
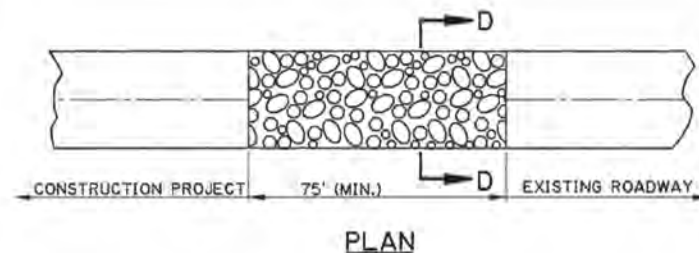
TEMPORARY SEDIMENT CHECK DAM (HAY)

PAY ITEM: TEMPORARY SEDIMENT CHECK DAM (HAY)

NOTES:

NOTES:
A HAY BALE BARRIER IS A TEMPORARY SEDIMENT BARRIER CONSISTING OF A ROW OF ENTRENCHED AND ANCHORED BALES OF STRAW OR HAY. THE HAY BALE BARRIER IS ALSO USED AS A CHECK DAM TO REDUCE THE VELOCITY IN SMALL DITCHES OR SWALES. THE HAY BALES SHALL BE IN ACCORDANCE WITH PROJECT SPECIFICATIONS FOR TEMPORARY EROSION CONTROL.
A FEW BASIC DESIGN GUIDELINES FOR THE USE OF A HAY BALE BARRIER ARE:

1. USE WHERE EROSION WOULD OCCUR IN THE FORM OF SHEET AND RILL EROSION
2. USE IN MINOR SWALES OR DITCHES WHERE THE MAXIMUM DRAINAGE AREA IS 2 ACRES
3. ONLY USE WHERE THE EFFECTIVENESS IS REQUIRED FOR LESS THAN 3 MONTHS
4. DO NOT USE IN LIVE STREAMS OR IN SWALES OR DITCHES WHERE THERE IS A POSSIBILITY OF A WASHOUT



TEMPORARY STONE CONSTRUCTION ENTRANCE

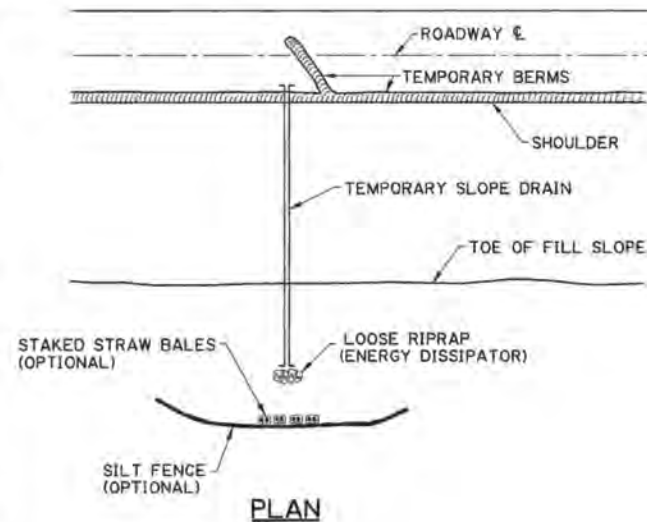
PAY ITEM: TEMPORARY STONE CONSTRUCTION ENTRANCE

NOTES:

TEMPORARY STONE CONSTRUCTION ENTRANCE AND/OR WASH RACK

A STONE STABILIZED PAD LOCATED AT POINTS OF VEHICULAR INGRESS AND EGRESS ON THE CONSTRUCTION SITE TO REDUCE THE AMOUNT OF MUD TRANSPORTED ONTO PUBLIC ROADS. IF THE ACTION OF THE VEHICLE TRAVELING OVER THE GRAVEL PAD IS NOT SUFFICIENT TO REMOVE THE MAJORITY OF THE MUD, THEN THE TIRES MUST BE WASHED BEFORE THE VEHICLE ENTERS A PUBLIC ROAD. A FEW BASIC DESIGN GUIDELINES FOR THE USE OF A STONE ENTRANCE AND/OR WASH RACKS ARE:

1. THE STONE LAYER MUST BE AT LEAST 6 INCHES THICK.
2. THE STONE SHALL CONFORM TO PROJECT SPECIFICATIONS FOR RIPRAP (CLASS 2 LB).
3. THE LENGTH OF THE PAD MUST BE A LEAST 75 FEET AND IT MUST EXTEND THE FULL WIDTH OF THE VEHICULAR INGRESS AND EGRESS.
4. A GEOTEXTILE FABRIC UNDERLINER IS REQUIRED. THE GEOTEXTILE FABRIC SHALL BE IN ACCORDANCE WITH PROJECT SPECIFICATIONS FOR GEOTEXTILE FABRIC (CLASS D).
5. IF A WASH RACK IS NECESSARY, PROVISIONS MUST BE MADE TO INTERCEPT THE WASH WATER AND TRAP THE SEDIMENT BEFORE IT IS CARRIED OFF-SITE.

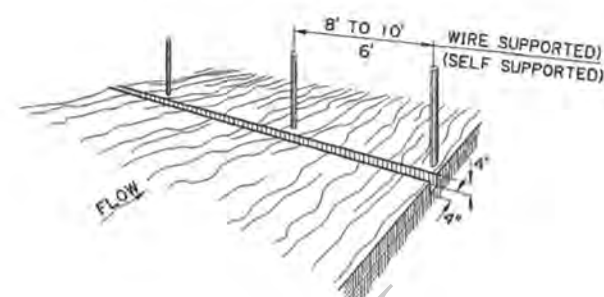


TEMPORARY SLOPE DRAIN

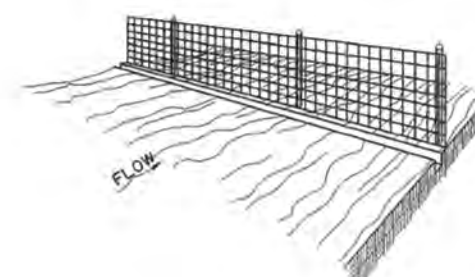
A TEMPORARY SLOPE DRAIN IS A DEVICE USED TO CARRY WATER FROM THE CONSTRUCTION WORK AREA TO A LOWER ELEVATION. SLOPE DRAINS MAY BE PLASTIC SHEET, METAL OR PLASTIC PIPE, STONE GUTTERS, FIBER MATS, OR CONCRETE OR ASPHALT DITCHES. A FEW BASIC DESIGN GUIDELINES FOR THE USE OF A TEMPORARY SLOPE DRAIN ARE:

1. THE SPACING OF THE SLOPE DRAINS VARIES WITH THE ROAD GRADE.
FOR GRADES: 0.0% - 2.0% USE 500' SPACING
2.1% - 5.0% USE 200' SPACING
GREATER THAN 5.0% USE 100' SPACING
2. SLOPE DRAIN MATERIAL: SMOOTH PIPE - 8" MINIMUM - 3 MILS THICK MIN.
CORRUGATED PIPE - 12" MINIMUM
PLASTIC SHEETING - 4' WIDE MINIMUM
PLASTIC SHEETING - 3 MILS THICK MIN.
3. PLASTIC SHEETING CAN BE STAKED DOWN OR WEIGHTED WITH ROCKS OR LOGS. THE AREA UNDER THE SHEETING SHOULD BE SHAPED TO PROVIDE AN ADEQUATE CHANNEL.
4. THE OUTLET END SHOULD BE PROTECTED OR HAVE SOME MEANS OF DISSIPATING ENERGY. THE FLOW SHOULD BE DIRECTED THROUGH A SEDIMENT TRAP SUCH AS A SILT FENCE, HAY BALES, OR OTHER APPROVED SEDIMENT CONTROL DEVICES.
5. TO INSURE PROPER OPERATION, TEMPORARY SLOPE DRAINS SHOULD BE INSPECTED REGULARLY AND AFTER EACH STORM, FOR CLOGGING OR DISPLACEMENT. EROSION AT THE OUTLET SHOULD BE CHECKED AND THE SILT TRAPS CLEANED IF NECESSARY.

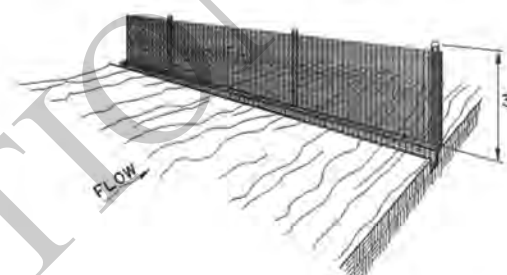
1. SET POSTS AND EXCAVATE A 4" X 4" TRENCH UPSLOPE ALONG THE LINE OF POSTS.



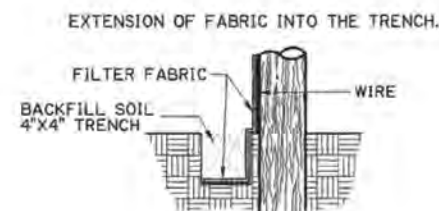
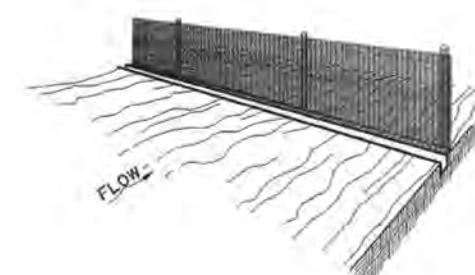
2. STAPLE WIRE FENCING TO THE POSTS.



3. ATTACH THE FILTER FABRIC TO THE WIRE FENCE AND EXTEND IT INTO THE TRENCH.



4. BACKFILL AND COMPACT EXCAVATED SOIL.



CONSTRUCTION OF TEMPORARY SILT FENCING

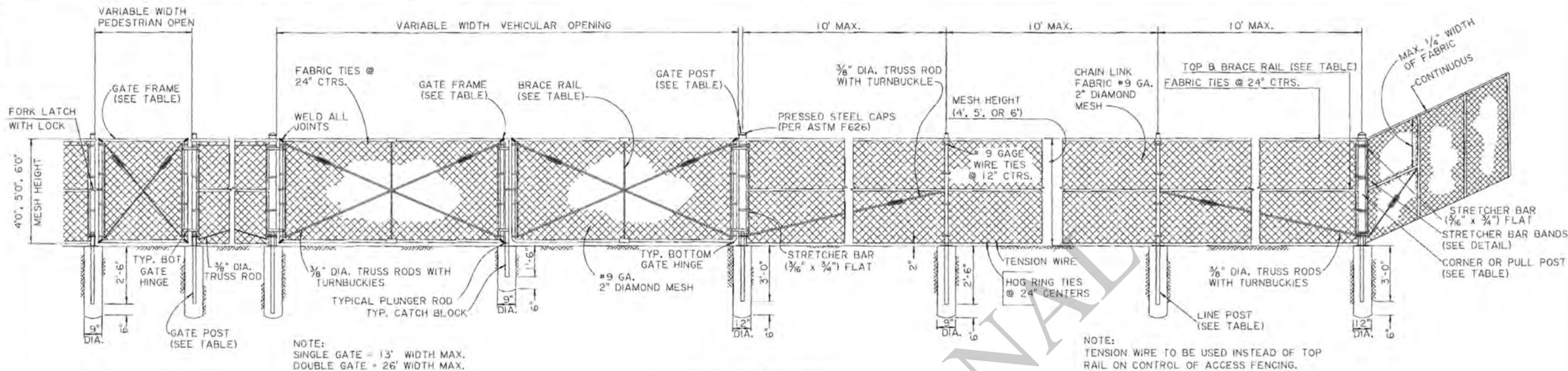
(WIRE SUPPORTED SILT FENCE IS SHOWN. SELF SUPPORTED SILT FENCE WILL BE CONSTRUCTED ACCORDING TO MANUFACTURERS SPECIFICATIONS.)

NOTES:

SILT FENCING IS A TEMPORARY SEDIMENT BARRIER CONSISTING OF A FILTER FABRIC SUPPORTED BY POSTS AND STRETCHED ACROSS AN AREA TO INTERCEPT AND DETAIN SMALL AMOUNTS OF SEDIMENT. THE SILT FENCING SHALL BE IN ACCORDANCE WITH PROJECT SPECIFICATIONS FOR TEMPORARY EROSION CONTROL. A FEW BASIC GUIDELINES FOR THE USE OF SILT FENCING ARE:

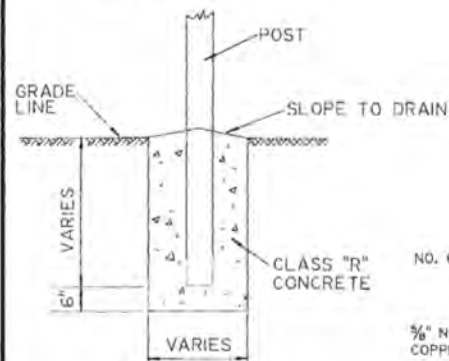
1. USE WHERE EROSION WOULD OCCUR IN THE FORM OF SHEET AND RILL EROSION
2. USE WHERE THE MAXIMUM DRAINAGE AREA BEHIND THE SILT FENCE IS 1/4 ACRE PER 100 FEET OF SILT FENCE LENGTH
3. USE WHERE THE MAXIMUM SLOPE LENGTH BEHIND THE BARRIER IS 100 FEET
4. USE WHERE THE MAXIMUM GRADIENT BEHIND THE BARRIER IS 2:1
5. DO NOT USE SILT FENCES IN LIVE STREAMS OR IN DITCHES OR SWALES WHERE FLOWS EXCEED ONE CUBIC FOOT PER SECOND

SHEET NUMBER	1-14-94	2 OF 2
REGION	FEDERAL PROJECT	STATE PROJECT
JCM	KAJ	JCM
RETURNED	CHECKED	DATE
REVISION	DESCRIPTION	DATE
10-1-08	REMOVE SPECIFIC PAY ITEM NOS., GENERAL REVISIONS	10-1-08
DATE	APPROVED BY	CHIEF ENGINEER
10-1-08	W. H. Temple	
TEMPORARY EROSION CONTROL DETAILS	EC-01	
HYDRAULICS SECTION		

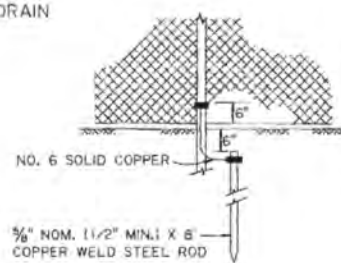


CHAIN LINK FENCE (4', 5', AND 6')

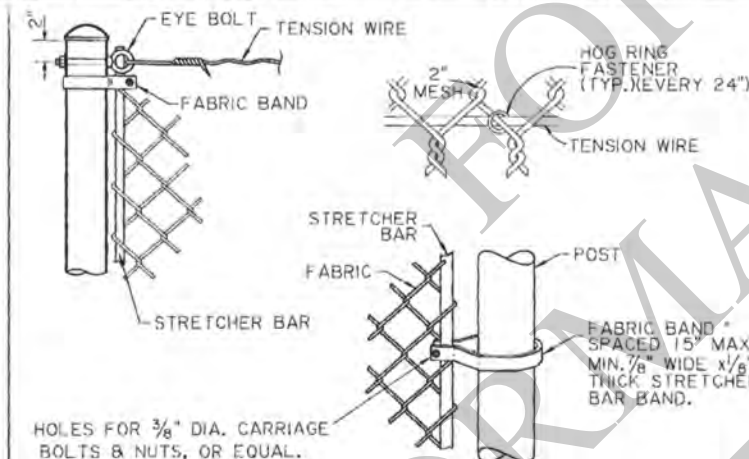
NOTE: ALL CONC. FOOTING SHALL BE CROWNED 2" ABOVE GRADE LINE.



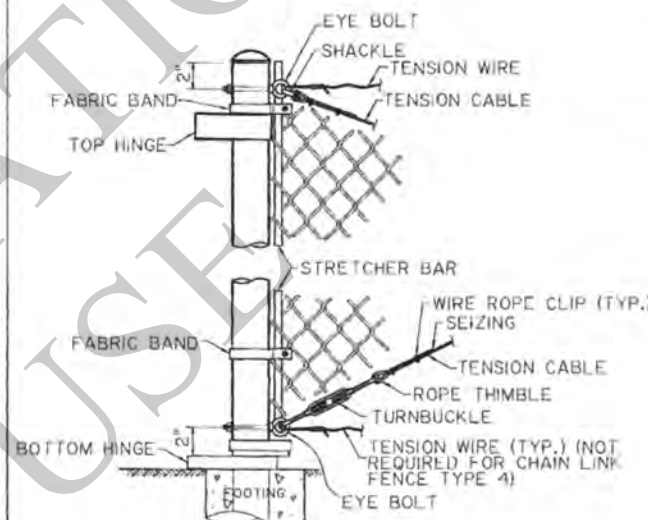
DETAIL OF POST FOOTING



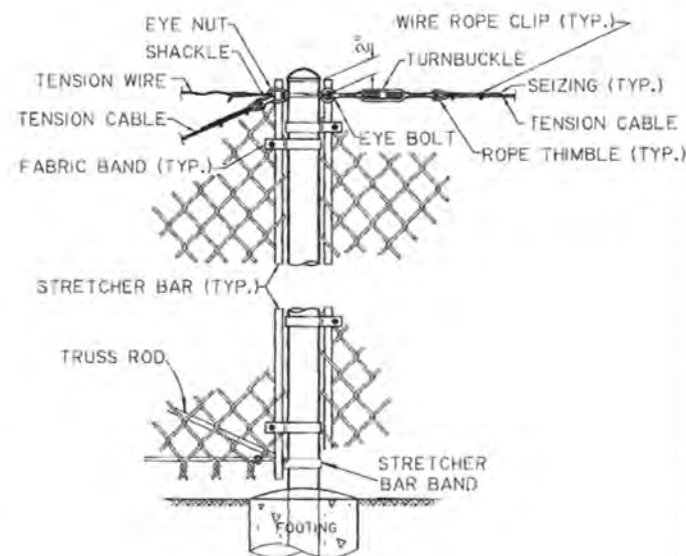
DETAIL OF GROUND WIRES FOR FENCES



FABRIC & TENSION WIRE DETAILS



GATE POST DETAIL

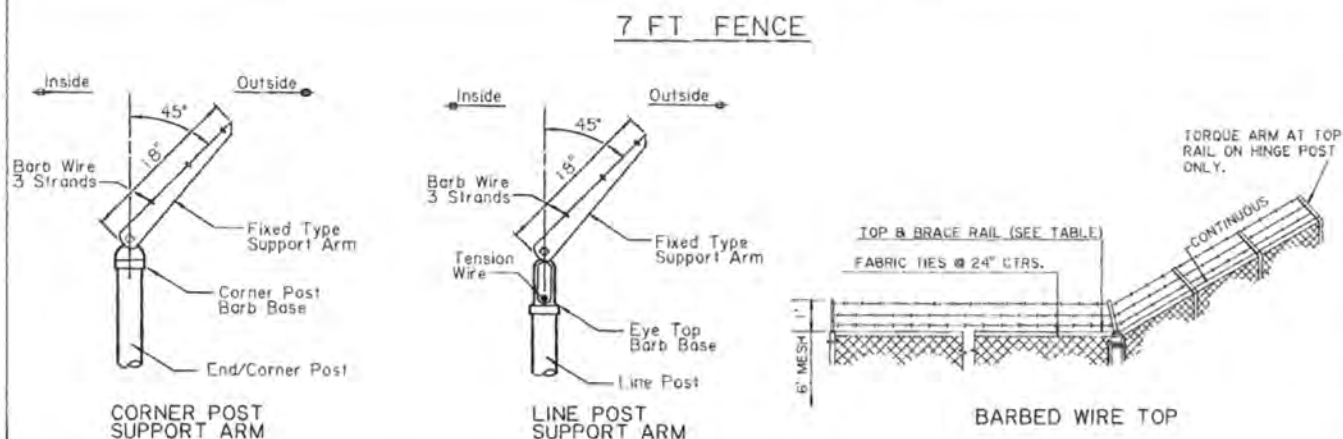


BRACE & TRUSS CONNECTION AT LINE POST

NOTES:

- THE FENCE INSTALLATION AND DETAILS SHOWN ARE TYPICAL AND MAY VARY IN ACCORDANCE WITH DIFFERENT MANUFACTURERS, PROVIDED THEY MEET THE STANDARD SPECIFICATIONS.
- TYPICAL INSTALLATION PLAN MAY VARY AS SHOWN ON THE PLANS OR AS DIRECTED BY THE ENGINEER. LOCATION OF GATES TO BE SHOWN ON PLANS.
- GROUNDING ROD ASSEMBLIES ARE TO BE INSTALLED IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS.
- ALL BOLTS TO BE UPSET TO DISCOURAGE VANDALISM.
- ALL CONNECTION METHODS TO BE APPROVED BY THE PROJECT ENGINEER.
- LOCATION OF GATES TO BE SHOWN ON PLANS.
- LATERAL FENCE TO BE SAME CONSTRUCTION AS FRONTAL FENCE.
- CONTROL OF ACCESS FENCE SHALL BE 5 FT IN HEIGHT UNLESS OTHERWISE NOTED IN THE PLANS.
- AT EACH LOCATION WHERE AN ELECTRIC TRANSMISSION, DISTRIBUTION, OR SECONDARY LINE CROSSES A FENCE, THE CONTRACTOR SHALL FURNISH AND INSTALL A GROUND CONFORMING TO ARTICLE 250 OF THE NATIONAL ELECTRIC CODE. A GROUND SHALL ALSO BE INSTALLED AT A MAXIMUM SPACING OF 500 FT. ALONG THE FENCE. GROUNDING WILL NOT BE PAID FOR SEPARATELY BUT SHALL BE INCLUDED IN THE COST OF THE FENCE.
- SEE AASHTO M-181 FOR ADDITIONAL REQUIREMENTS.

	STANDARD			POST & RAIL TABLE			ALTERNATES		
	OUTSIDE DIA. (INCHES)	LBS. (PER LIN.FT.)	DIMENSION (INCHES)	SECTION	LBS. (PER LIN.FT.)	ASTM F1043 GROUP	OUTSIDE DIA. (INCHES)	LBS. (PER LIN.FT.)	DIMENSION (INCHES)
LINE POST	2 3/4"	3.65	2.375	ROUND	3.12		2 1/2"	2.25	1.70
			2.25 X 1.70	H	3.26	III			
			2.25 X 1.70	HEAVY C	2.78	II			
			1.875 X 1.625	STD. C	2.40	I			
BRACE RAIL	1 3/4"	2.27	1.660	ROUND	1.84				
COR. POST	2 3/4"	5.79	2.875	ROUND	4.64				
GATE POST	4.0	9.10	3.500	ROUND	5.71	IC			
GATE FRAME	1 3/4"	2.72	1.900	ROUND	2.28				

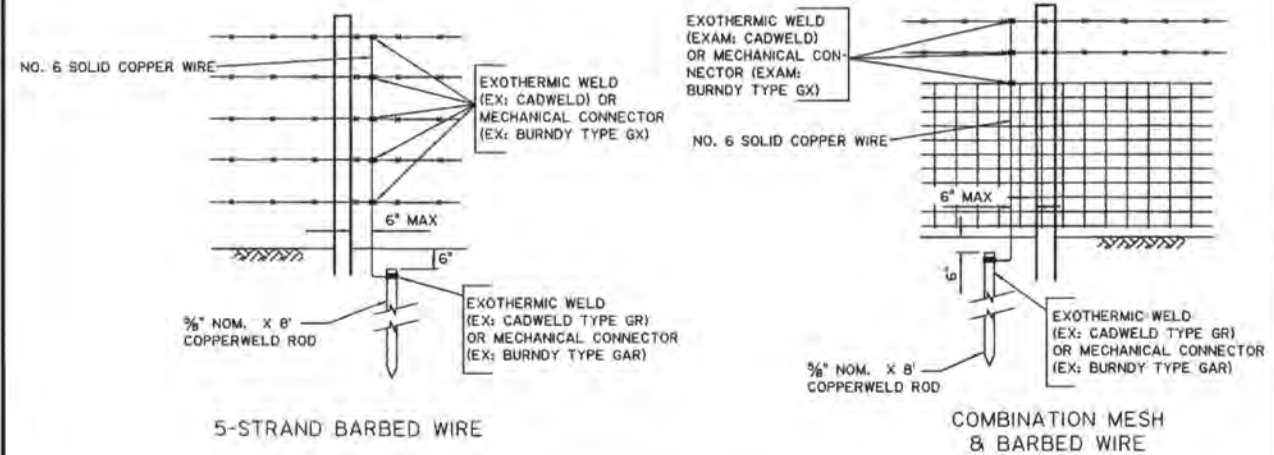


BARBED WIRE TOP

SHEET NUMBER	1 OF 1
DESIGNED	ROAD DESIGN
CHECKED	ROAD DESIGN
DATE	01-07-11
BY	11-3-11
DATE	11-3-11
REVISION DESCRIPTION	
APPROVED BY	
CHIEF ENGINEER	
STANDARD PLAN: FN-G1	
CHAIN LINK FENCE & GATES	
4 FT., 5 FT., 6 FT. & 7 FT.	
ROAD DESIGN	

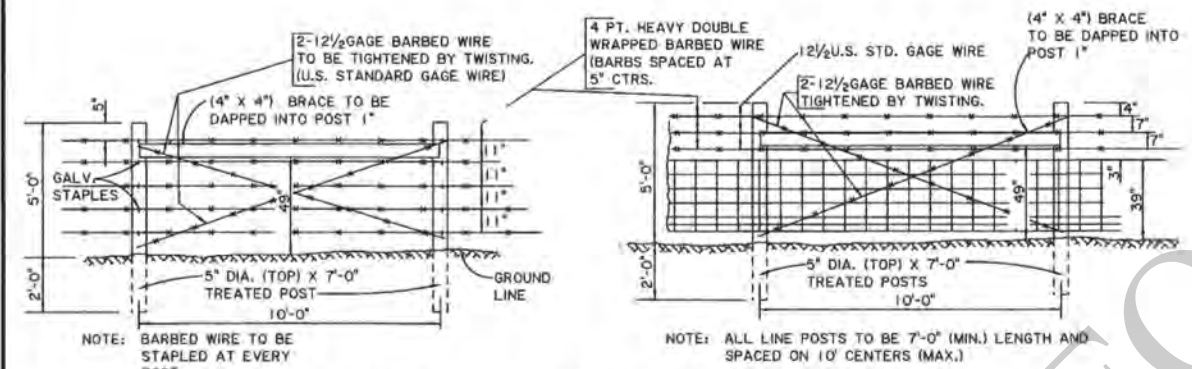
NOTE: GROUNDING DEVICES ARE TO BE INSTALLED IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS.

ALL CONNECTION METHODS TO BE APPROVED BY PROJECT ENGINEER.



GROUNDING DETAILS

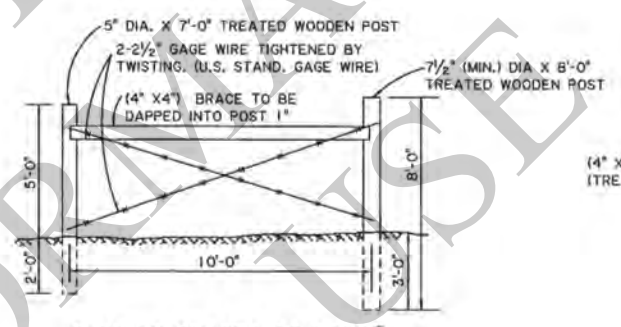
1 3/4" GALV. STAPLES TO BE USED IN WOODEN POSTS. GALV. STAPLES TO BE PLACED ON TOP AND BOTTOM STRANDS AND EVERY OTHER WIRE BETWEEN, ALTERNATING ON SUCCESSIVE POSTS.



SHOWING BRACES IN STRAIGHT LINE OF FENCE*

NOTE: ALL LINE POSTS TO BE 7'-0" (MIN.) LENGTH AND SPACED ON 10' CENTERS (MAX.)

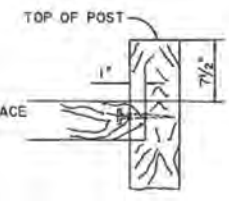
NOTE: METAL LINE POSTS MAY BE USED IN CONJUNCTION WITH WOODEN CORNER GATE AND BRACE POSTS, PROVIDED THAT METAL AND WOODEN POSTS ARE NOT MIXED BETWEEN CORNER POSTS.



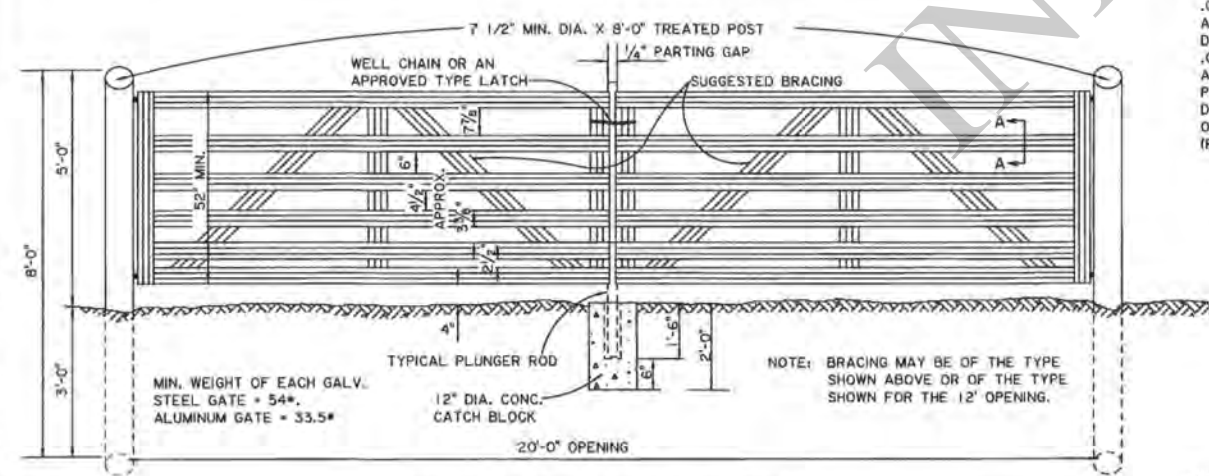
SHOWING BRACES AT GATE* (BACK VIEW) (FENCE NOT SHOWN)

BRACING DETAILS

NOTE: FOR ALTERNATE METHOD OF BRACING, SEE SHT. 2 OF THIS STANDARD (FN-02).



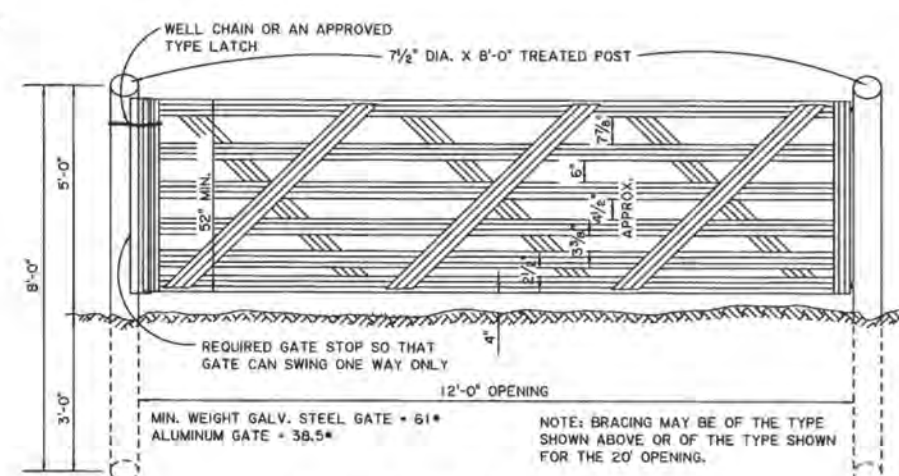
DETAIL OF BRACE DAPPED INTO POST



DOUBLE SWINGING DRIVEWAY GATE (ALUMINUM OR GALVANIZED STEEL) (SUGGESTED TYPE)

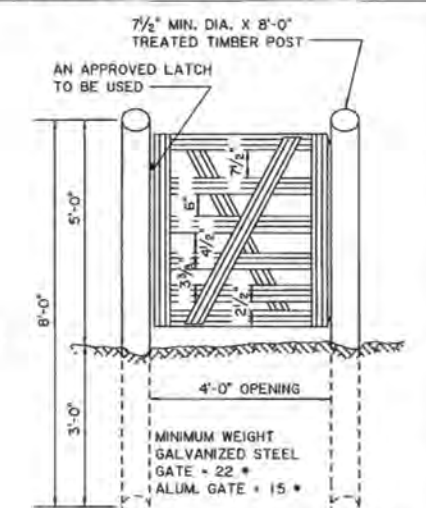
TYPICAL SECTION THRU PANEL SECTION A-A

HORIZONTAL PANELS TO BE .051" THICK (MIN.) (FOR ALUM. GATE). VERTICAL AND DIAGONAL BRACES TO BE .040" THICK (MIN.) (FOR ALUM. GATE). HORIZONTAL PANELS, VERTICAL AND DIAGONAL BRACE TO BE .025" THICK (MIN.) (FOR GALV. GATE).



SINGLE SWINGING DRIVEWAY GATE (ALUMINUM OR GALVANIZED STEEL) (SUGGESTED TYPE)

NOTE: BRACING MAY BE OF THE TYPE SHOWN ABOVE OR OF THE TYPE SHOWN FOR THE 20' OPENING.

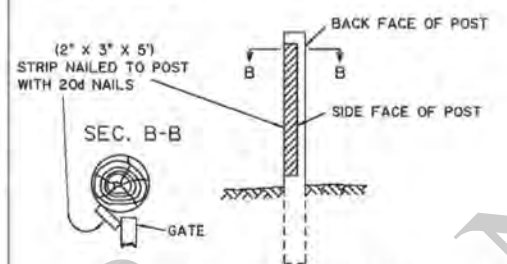


SINGLE SWINGING WALKGATE (ALUMINUM OR GALVANIZED STEEL) (SUGGESTED TYPE)

ALL POST DIAMETERS ARE MEAN DIAM. AT SMALL END



NOTE: GATES ARE TO OPEN AWAY FROM HIGHWAY UNLESS OTHERWISE DIRECTED BY ENGINEER.

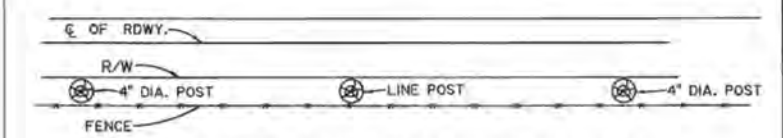


DETAIL AT STOP FOR WOODEN GATE POST

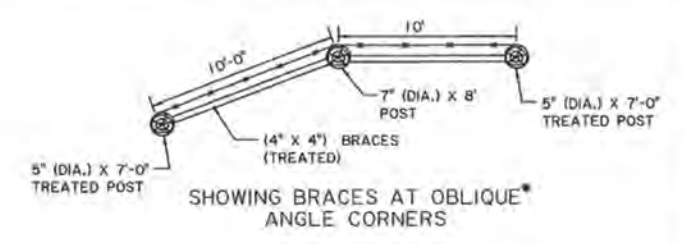


SUGGESTED TYPE SCREW HOOK HINGE FOR WOODEN POST 3/4" x 7 1/2" SCREW HOOK HINGE

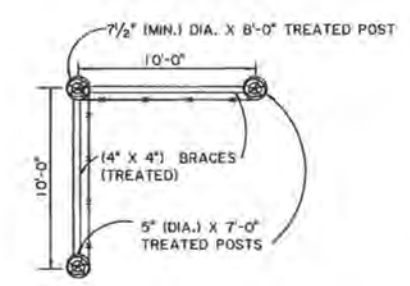
NOTE: LINE POST TO BE LOCATED OUTSIDE OF R/W LINE. WIRE TO BE PLACED ON OUTSIDE OF R/W, UNLESS OTHERWISE DIRECTED BY ENGINEER OR REQUESTED BY PROPERTY OWNER AND APPROVED BY ENGINEER. FOR CONTROL OF ACCESS, LINE POST TO BE LOCATED WITHIN HIGHWAY R/W.



DETAIL SHOWING LOCATION OF FENCE IN RELATION TO THE R/W LINE

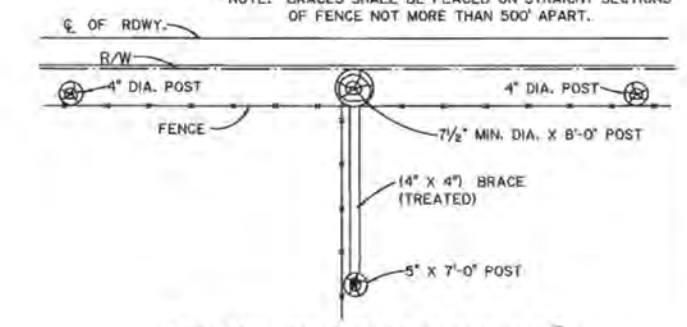


SHOWING BRACES AT OBLIQUE* ANGLE CORNERS



SHOWING BRACES AT RIGHT ANGLE CORNERS*

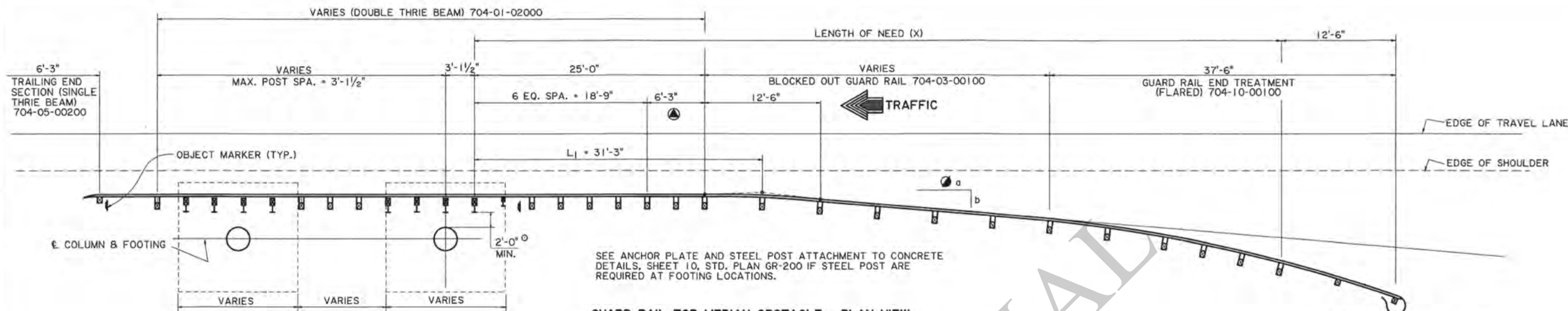
NOTE: BRACES SHALL BE PLACED ON STRAIGHT SECTIONS OF FENCE NOT MORE THAN 500' APART.



INTERSECTING BRACES ALONG R/W* TO BE INSTALLED IN FENCES

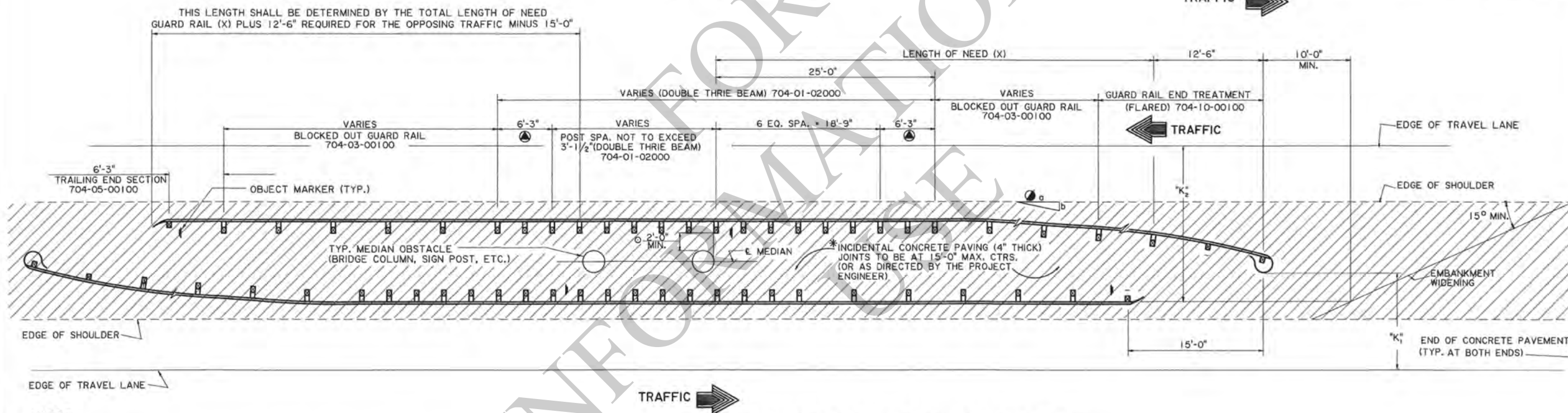
ALL INTERSECTING FENCES TO BE SECURELY ATTACHED TO FRONTAGE FENCE AS SHOWN HERE.





(WHEN "K" $\geq L_c$)
(L_c = CLEAR ZONE DISTANCE)

LAYOUT SAME FOR OPPOSITE SIDE
OF MEDIAN BUT IN OPPOSITE DIRECTION.



THIS STANDARD SHALL BE USED IN CONJUNCTION WITH STANDARD PLAN GR-200

DESIRABLE LOCATION FOR GUARD RAIL: GUARD RAIL SHALL BE PLACED AS FAR AWAY FROM TRAFFIC AS POSSIBLE BUT NO CLOSER THAN 2'-0" FROM THE OBSTACLE AS SHOWN.

FOR CLEARANCES OF MORE THAN 5'-0", ITEM 704-01-02000, GUARD RAIL (DOUBLE THRIE BEAM) (3'-1/2" POST SPA.) MAY BE REPLACED BY ITEM 704-01-01020 WHICH IS A SINGLE THRIE BEAM WITH 6'-3" POST SPACING.

FOR CLEAR ZONE DISTANCE (Lc) SEE TABLE 1, SHEET 2, STD. PLAN GR-200. "K" "K1" AND "K2" ARE DISTANCES MEASURED FROM EDGE OF TRAVEL LANE TO BACK FACE OF GUARD RAIL.

* INCIDENTAL CONCRETE PAVING (4" THICK) TO BE PAID FOR UNDER ITEM 706-03-00100, PER SQ. YARD. THE INCIDENTAL CONCRETE WILL BE USED ON THE PROJECT ONLY IF A QUANTITY & PAY ITEM ARE SHOWN ON THE SUMMARY OF ESTIMATED QUANTITIES. SEE SHEET 10, GR-200 STD. PLAN FOR REQUIRED POST PAVING DETAILS.

① 6'-3" W BEAM/THREE BEAM TRANSITION SECTION.

LENGTH OF NEED (X) TO BEGIN AT FIRST POST PRIOR TO OBSTACLE AS SHOWN.

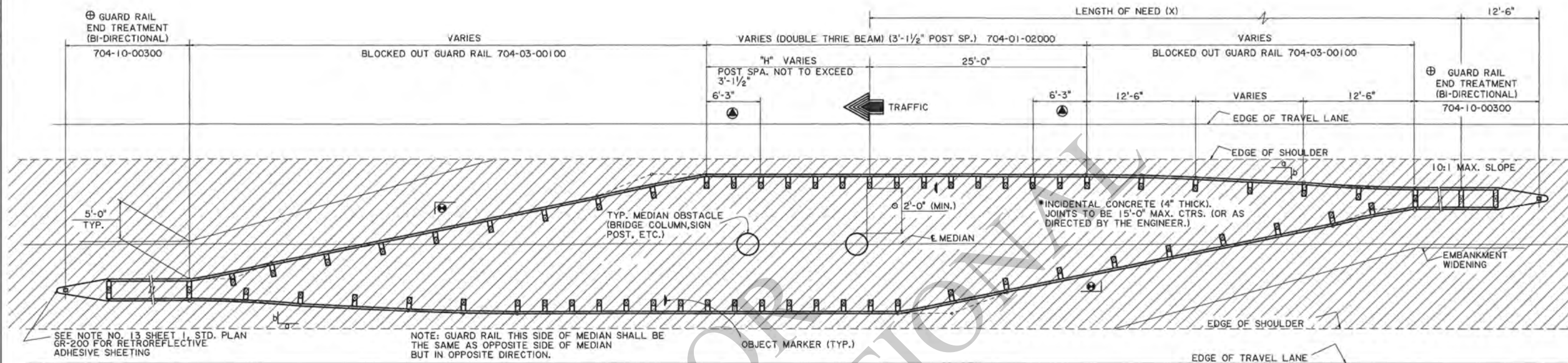
⊙ DIMENSION MEASURED FROM BACK FACE OF GUARD RAIL POST TO FRONT FACE OF OBSTACLE.

FLARE RATE SHALL BE IN ACCORDANCE WITH DESIGN SPEED AS SHOWN ON SHEET 2
STD. PLAN GR-200.

(ONLY WHEN " K_1 " < L_C AND " K_2 " > L_C)

SEE SHT. 2 OF 8 FOR DESIRABLE LAYOUT





GUARD RAIL FOR MEDIAN OBSTACLE (DESIRABLE) - PLAN VIEW

(WHEN "K" < Lc; SEE NOTES AND DETAILS SHT. 1 OF 8)

NOTES:

THIS STANDARD PLAN SHALL BE USED IN CONJUNCTION WITH STANDARD PLAN GR-200.

DESIRABLE LOCATION FOR GUARD RAIL: GUARD RAIL SHALL BE PLACED AS FAR AWAY FROM TRAFFIC AS POSSIBLE BUT NO CLOSER THAN 2'-0" FROM THE OBSTACLE SHOWN.

FOR CLEARANCES OF MORE THAN 5'-0", ITEM 704-01-02000, GUARD RAIL (DOUBLE THRIE BEAM) (3'-1 1/2" POST SPA.) MAY BE REPLACED BY ITEM 704-01-01020 WHICH IS SINGLE THRIE BEAM WITH 6'-3" POST SPACING.

FOR CLEAR ZONE DISTANCE (Lc), SEE TABLE 1, SHEET 2, STD. PLAN GR-200

* INCIDENTAL CONCRETE PAVING (4" THICK) IS TO BE PAID FOR UNDER ITEM 706-03-00100 PER SQ. YARD. THE INCIDENTAL CONCRETE WILL BE USED ON THE PROJECT ONLY IF A QUANTITY & PAY ITEM ARE SHOWN ON THE SUMMARY OF ESTIMATED QUANTITIES. SEE SHT. 10, STD. PLAN GR-200 FOR REQUIRED POST PAVING DETAILS.

SEE NOTE 13, SHEET 1, STD. PLAN GR-200 FOR INFORMATION ON RETROREFLECTIVE ADHESIVE SHEETING FOR GUARD RAIL SYSTEMS.

"H" IS THE SHORTEST MULTIPLE OF 6'-3" WHICH EXCEEDS THE HAZARD LENGTH.

● GUARD RAIL SHALL BE FLARED TO MEET THE FRONT THRIE BEAM GUARDRAIL.

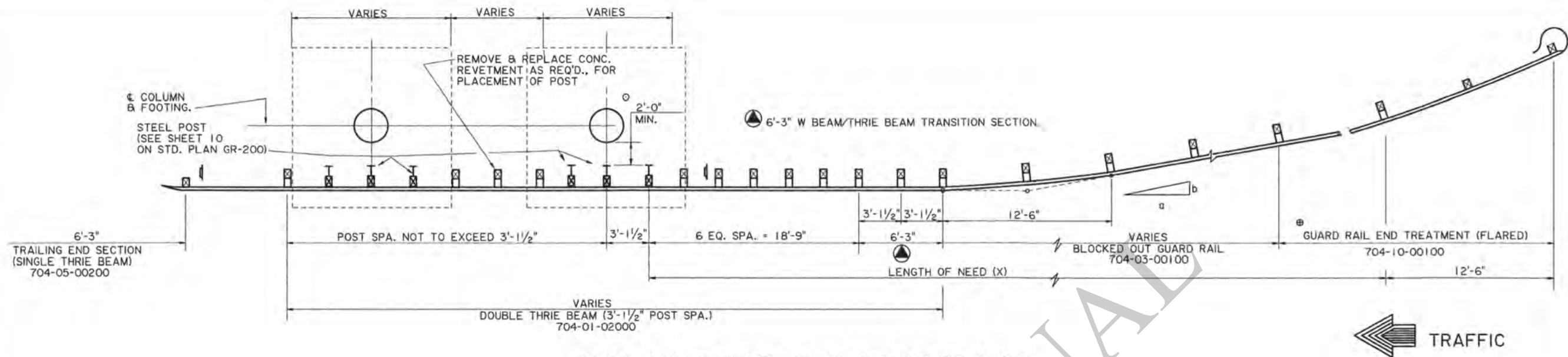
⊕ SEE STANDARD ITEM, 704-10-00300 FOR GUARD RAIL END TREATMENT (BI-DIRECTIONAL).

⊙ 6'-3" W BEAM/THRIE BEAM TRANSITION SECTION.

○ DIMENSION MEASURED FROM BACK FACE OF GUARD RAIL POST TO FRONT FACE OF OBSTACLE.

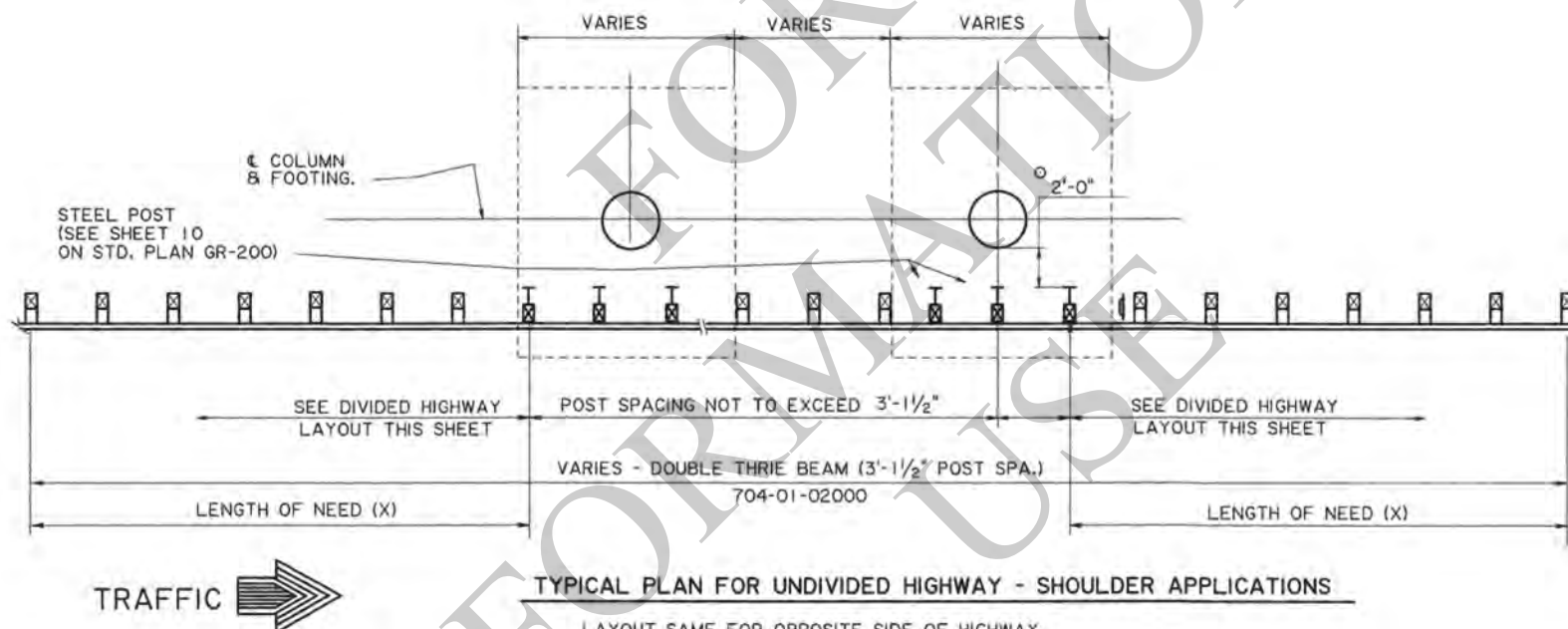


SHEET NUMBER	2 OF 8
PARISH	GRASS
FEDERAL PROJECT	P. FOSSIER
STATE PROJECT	OCT-2008
DESIGNED	K.M.B.
CHECKED	BY
DATE	6-13-2017
REVISION DESCRIPTION	DATE
2-15-17	UPDATED FOR 2016 SPECIFICATIONS
DATE	REVISION DESCRIPTION
APPROVED BY	DATE
CHEF ENGINEER	DATE
STATE OF LOUISIANA	DATE
HIGHWAY GUARD RAILS	DATE
MEDIAN OBSTACLE	DATE
2' MIN. CLEARANCE	DATE
(DESIRABLE)	DATE
GR-201	DATE
BRIDGE AND STRUCTURAL DESIGN	DATE



TYPICAL PLAN FOR DIVIDED HIGHWAY - SHOULDER APPLICATIONS

LAYOUT SAME FOR OPPOSITE SIDE OF HIGHWAY BUT IN OPPOSITE DIRECTION.



NOTES:

THIS STANDARD PLAN SHALL BE USED IN CONJUNCTION WITH STANDARD PLAN GR-200.

IDEAL LOCATION FOR GUARD RAIL: GUARD RAIL SHALL BE PLACED AS FAR AWAY FROM TRAFFIC AS POSSIBLE BUT NO CLOSER THAN 2'-0" FROM THE OBSTACLE AS SHOWN.

FOR CLEARANCES OF MORE THAN 5'-0", ITEMS 704-01-02000, DOUBLE THRIE BEAM (3'-1 1/2" POST SPA.) & 704-01-01000, SINGLE THRIE BEAM (3'-1 1/2" POST SPA.) MAY BE REPLACED BY ITEM 704-01-01020 WHICH IS A SINGLE THRIE BEAM WITH 6'-3" POST SPACING.

FOR CLEAR ZONE DISTANCE (Lc) SEE TABLE 1, SHEET 2, STD. PLAN GR-200

SEE ANCHOR PLATE AND STEEL POST ATTACHMENT TO CONCRETE DETAILS, SHEET 10, STD. PLAN GR-200 IF STEEL POSTS ARE REQUIRED AT FOOTING LOCATIONS.

○ DIMENSION MEASURED FROM BACK FACE OF GUARD RAIL POST TO FRONT FACE OF OBSTACLE.

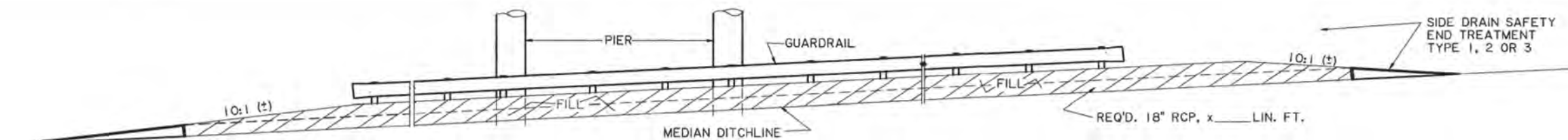
⊕ SEE NOTE 11, SHT. 1, GR-200 STD. PLAN

LENGTH OF NEED (X) TO BEGIN AT FIRST POST PRIOR TO THE OBSTACLE AS SHOWN.

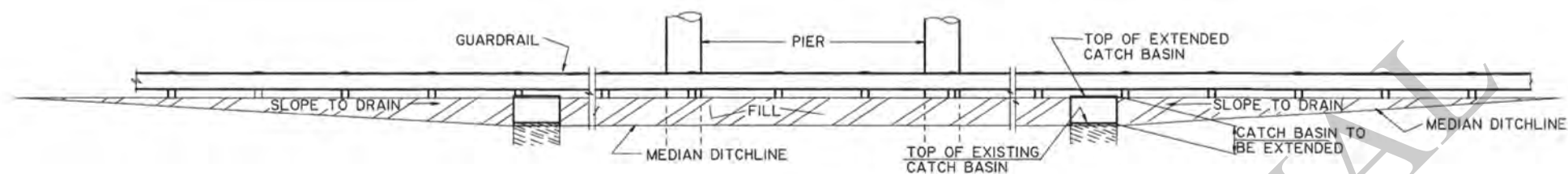
FOR EMBANKMENT WIDENING, SEE SHT. 1 STD. PLAN GR-200.



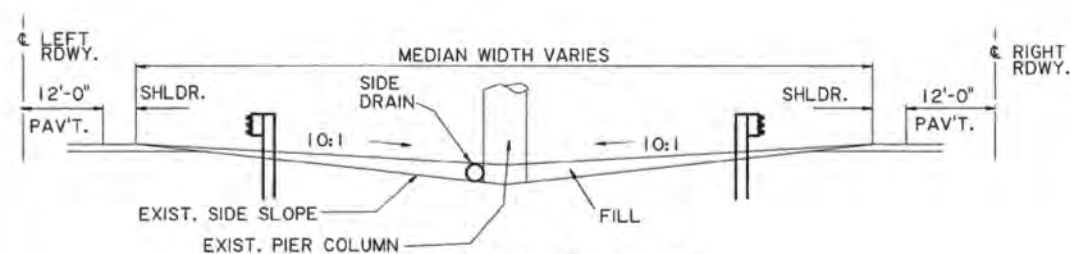
SHEET NUMBER	PARISH	FEDERAL PROJECT	STATE PROJECT
DESIGNED	CHECKED	DATE	SHEET
2-15-17	DATE	2-15-17	3 OF 8
UPDATED FOR 2016 SPECIFICATIONS	K.M.B.	BY	DATE
REVISION DESCRIPTION	6-13-2017	DATE	6-13-2017
APPROVED BY	CHIEF ENGINEER	DATE	6-13-2017
PAUL B. FOSSIER, JR.	CHIEF ENGINEER	DATE	6-13-2017
STATE OF LOUISIANA	PROFESSIONAL ENGINEER	DATE	6-13-2017
IN CIVIL ENGINEERING	DATE	6-13-2017	6-13-2017
HIGHWAY GUARD RAILS	DATE	6-13-2017	6-13-2017
DIVIDED AND UNDIVIDED	DATE	6-13-2017	6-13-2017
HIGHWAY SHOULDER APPLICATION	DATE	6-13-2017	6-13-2017
(2' MIN. CLEARANCE)	DATE	6-13-2017	6-13-2017
GR-201	DATE	6-13-2017	6-13-2017
BRIDGE AND STRUCTURAL DESIGN	DATE	6-13-2017	6-13-2017



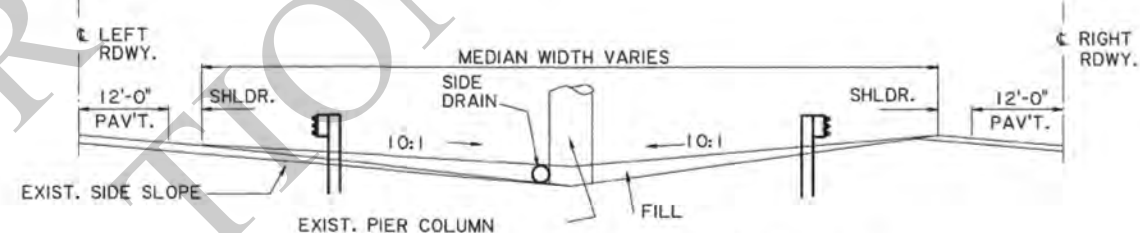
MEDIAN BANK FILL WITH DRAIN FLOW PIPE



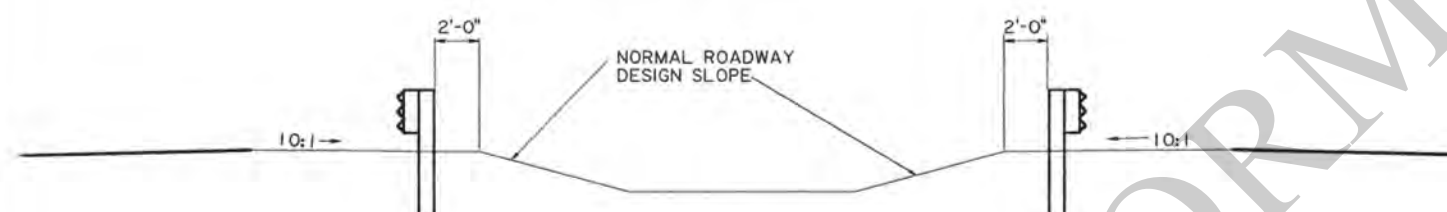
MEDIAN BANK FILL WITH CATCH BASIN



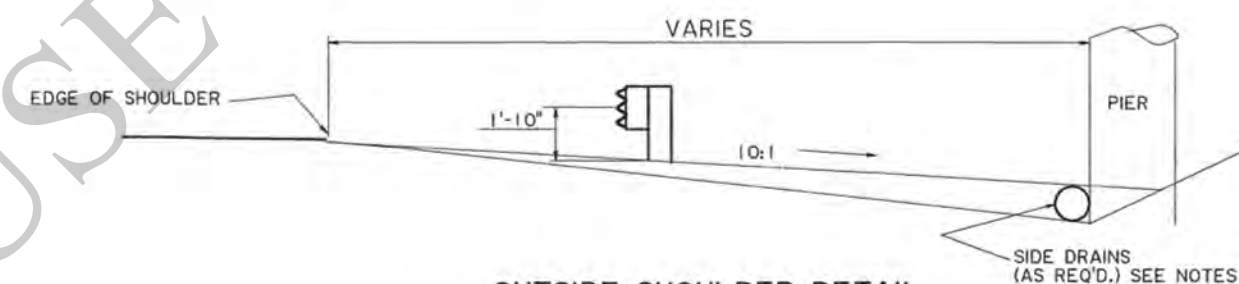
NORMAL SECTION



TYPICAL MEDIAN FILL TREATMENTS



ALTERNATE MEDIAN TREATMENT



OUTSIDE SHOULDER DETAIL

NOTES

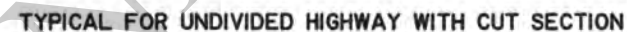
UNDER NO CIRCUMSTANCES SHALL THE MEDIAN OR SIDE SLOPE FILL INTERFERE WITH THE DRAINAGE. IF A CATCH BASIN FALLS WITHIN THE AREA OF NEW FILL, IT SHALL BE EXTENDED TO TOP OF THE NEW FILL TO ALLOW PROPER DRAINAGE. IF NECESSARY, PIPES MAY BE USED TO ACCOMMODATE SUBSURFACE DRAINAGE.

SLOPED CATCH BASIN, EXTENDING CATCH BASIN, SIDE DRAIN PIPE AND FILL TO BE PAID FOR UNDER THEIR RESPECTIVE PAY ITEMS.

THIS STANDARD PLAN SHALL BE USED IN CONJUNCTION WITH STANDARD PLAN GR-200.

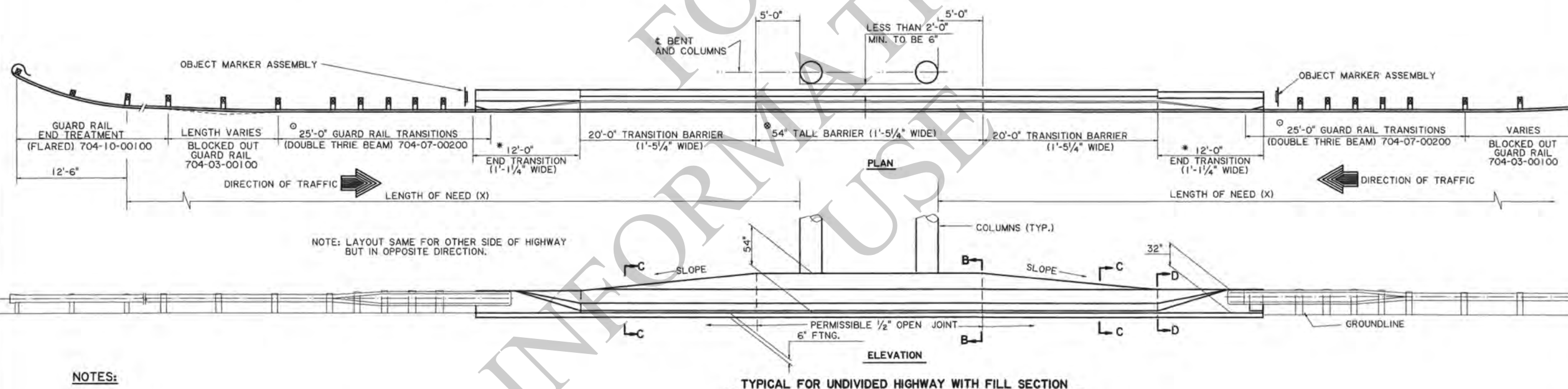
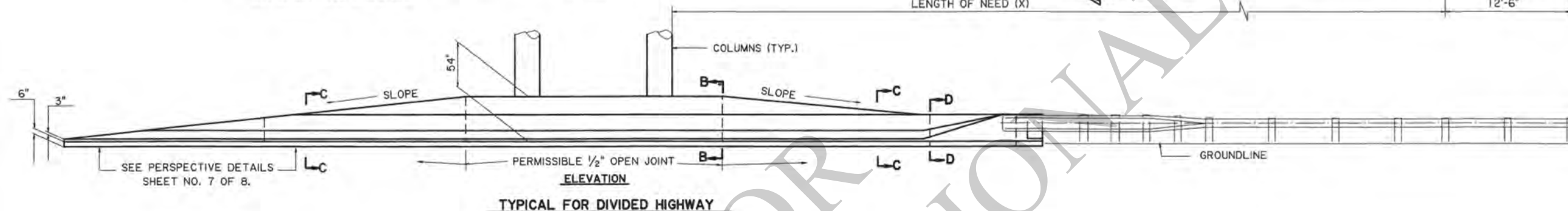
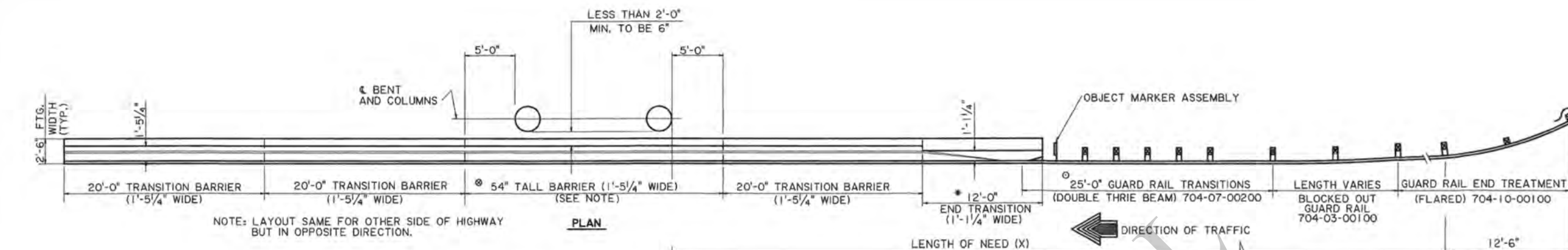


	HIGHWAY GUARD RAILS DRAINAGE DETAILS				DESIGNED		PARISH	
	2-15-17	UPDATED FOR 2016 SPECIFICATIONS	K.M.B.		CHECKED		FEDERAL PROJECT	
	DATE	REVISION DESCRIPTION	BY				STATE	
APPROVED BY					DATE	OCT. 2008		
					SHEET NUMBER			



⊗ LENGTH OF 54" BARRIER TO BE DETERMINED
BY THE LENGTH OF THE OBJECT TO BE PROTECTED.





NOTES:

- ⊗ LENGTH OF 54" TALL BARRIER TO BE DETERMINED BY THE LENGTH OF THE OBJECT TO BE PROTECTED. REGARDLESS OF LENGTH OF NEED (X), A MINIMUM OF 75'-0" GUARD RAIL SHALL BE INSTALLED AT THE END OF CONCRETE BARRIER. WHEN MINIMUM GUARD RAIL IS USED, SEE NOTE 2, SHT. 1 OF GR-200.

FOR ADDITIONAL INFORMATION AND BARRIER RAIL
DETAILS, SECTION B-B, C-C, D-D & E-E SEE
SHEET 7 AND 8 OF 8.

THIS STANDARD PLAN SHALL BE USED IN CONJUNCTION
WITH STANDARD PLAN GR-200.

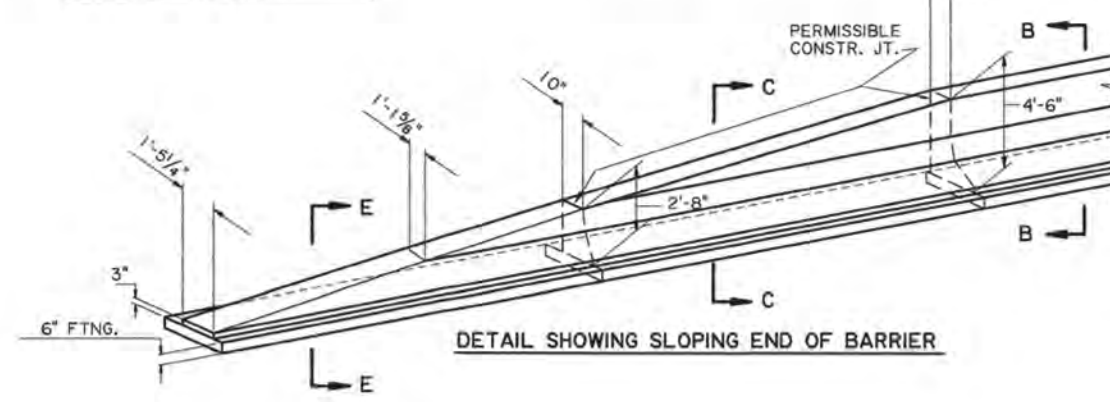
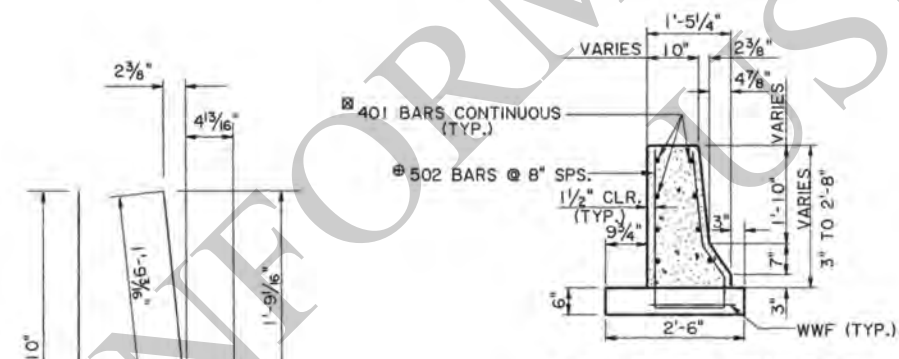
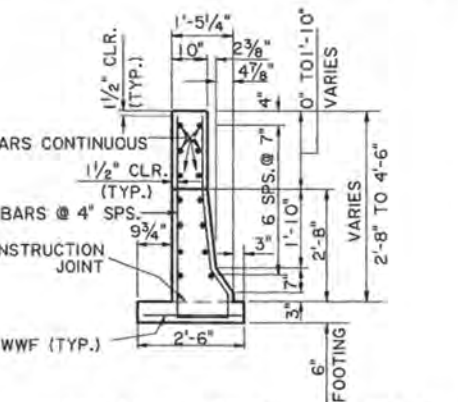
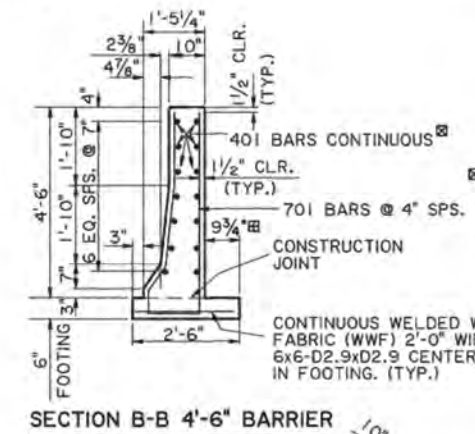
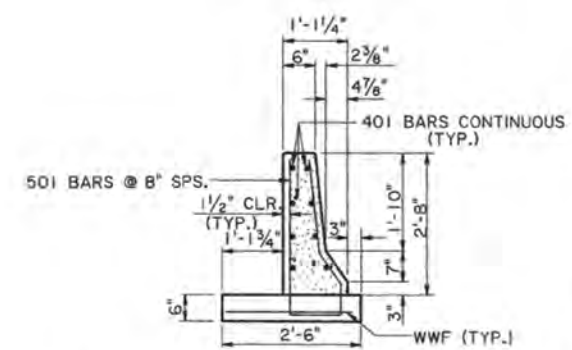
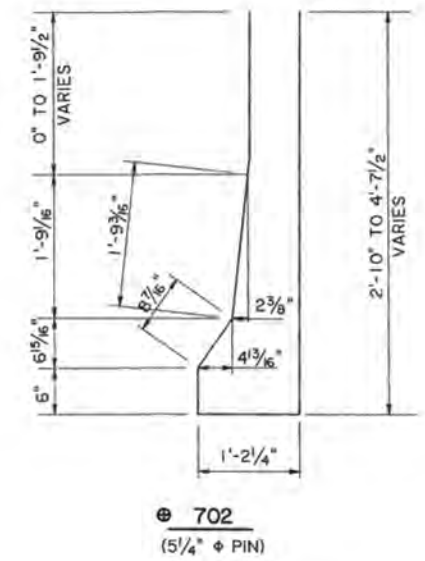
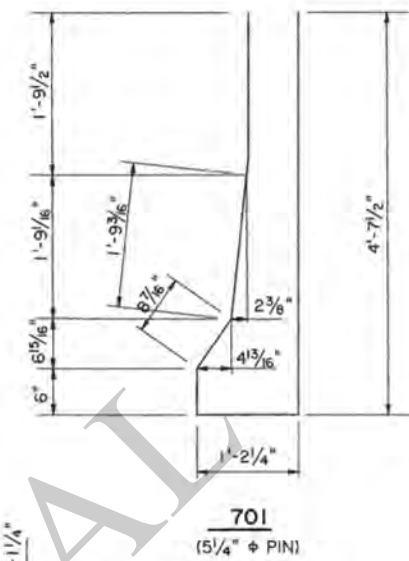
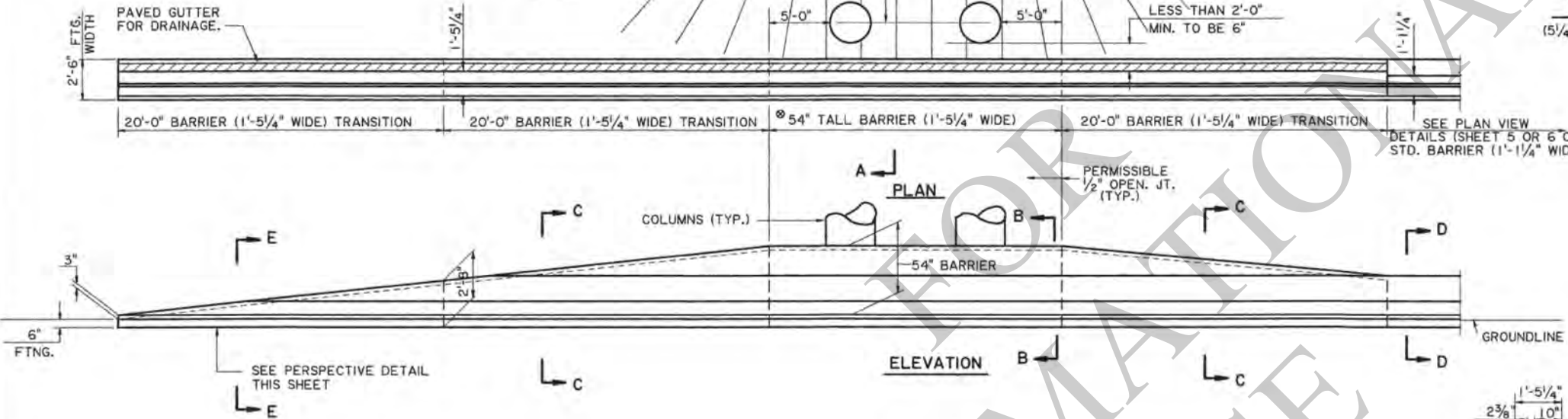
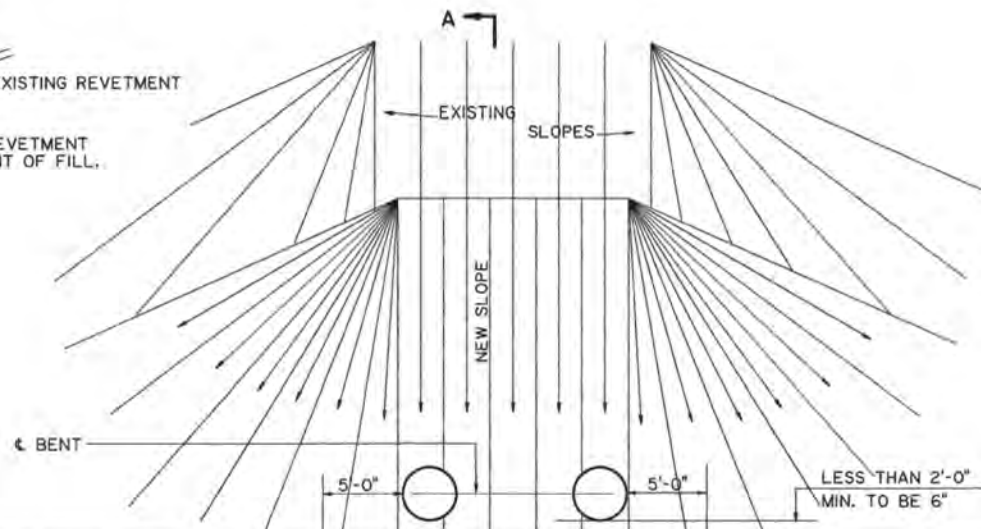
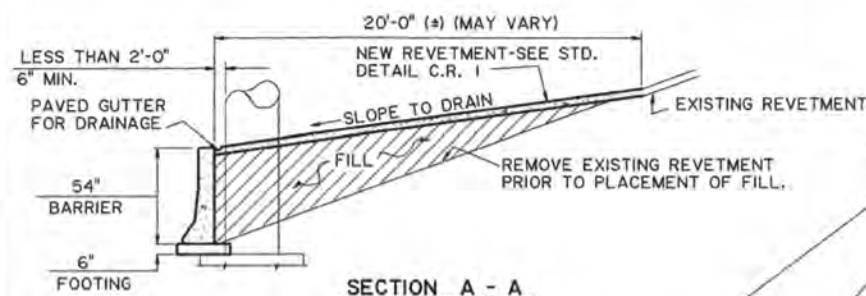
- * FOR REINFORCING DETAILS OF 12'-0" TRANSITION & TAPER, SEE BARRIER RAIL SPECIAL DETAILS.
- © 10' CURB REQUIRED, SEE SHT. 3, STD. PLAN GR-200 FOR DETAILS.

FUTURE OVERLAYS:

FOR FUTURE OVERLAY ON THE SHOULDER, WHERE IT MEETS THE PIER PROTECTION, THE OVERLAY SHALL PREFERABLY BE A MAXIMUM OF 3". THUS THE EFFECTIVE HEIGHT OF THE BARRIER AT 32" AND THE ATTACHED THRIE BEAM CAN BE LOWERED UP TO 3" WITHOUT FURTHER MODIFICATION TO THE HEIGHT OF THE BARRIER SYSTEM.

WHEN THE OVERLAY ON THE SHOULDER MUST EXCEED THE 3" MAXIMUM REQUIREMENT, MODIFY THE APPROACH SECTION OF THE PIER PROTECTION SYSTEM AT SECTION D-D TO WHICH THE THREE BEAM CONNECTS, BY RAISING IT TO A HEIGHT EQUAL TO THE DEPTH OF THE REQUIRED OVERLAY. THIS WOULD ALSO REQUIRE THE GUARDRAIL TO BE RAISED BY AN EQUAL AMOUNT.



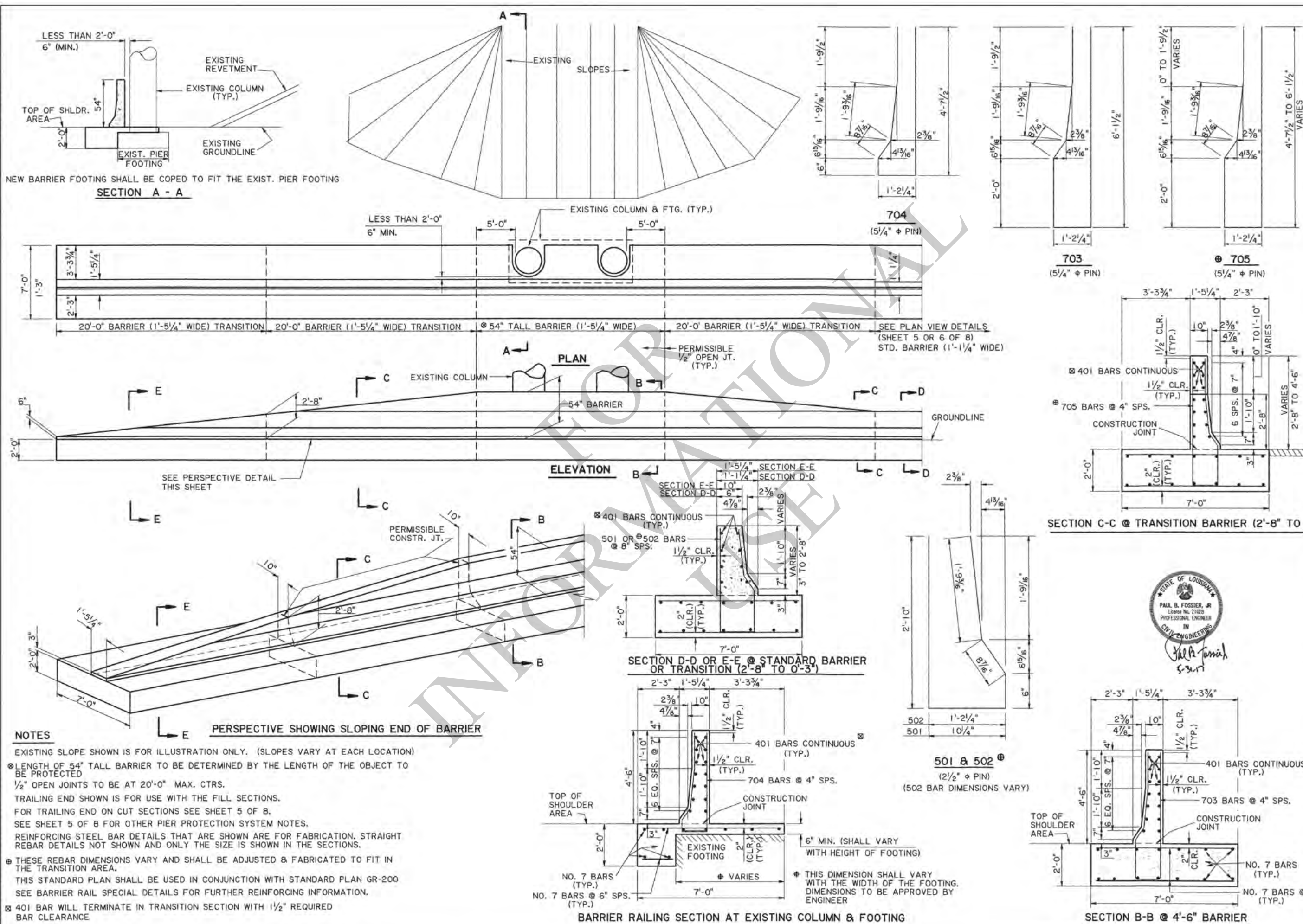


NOTES

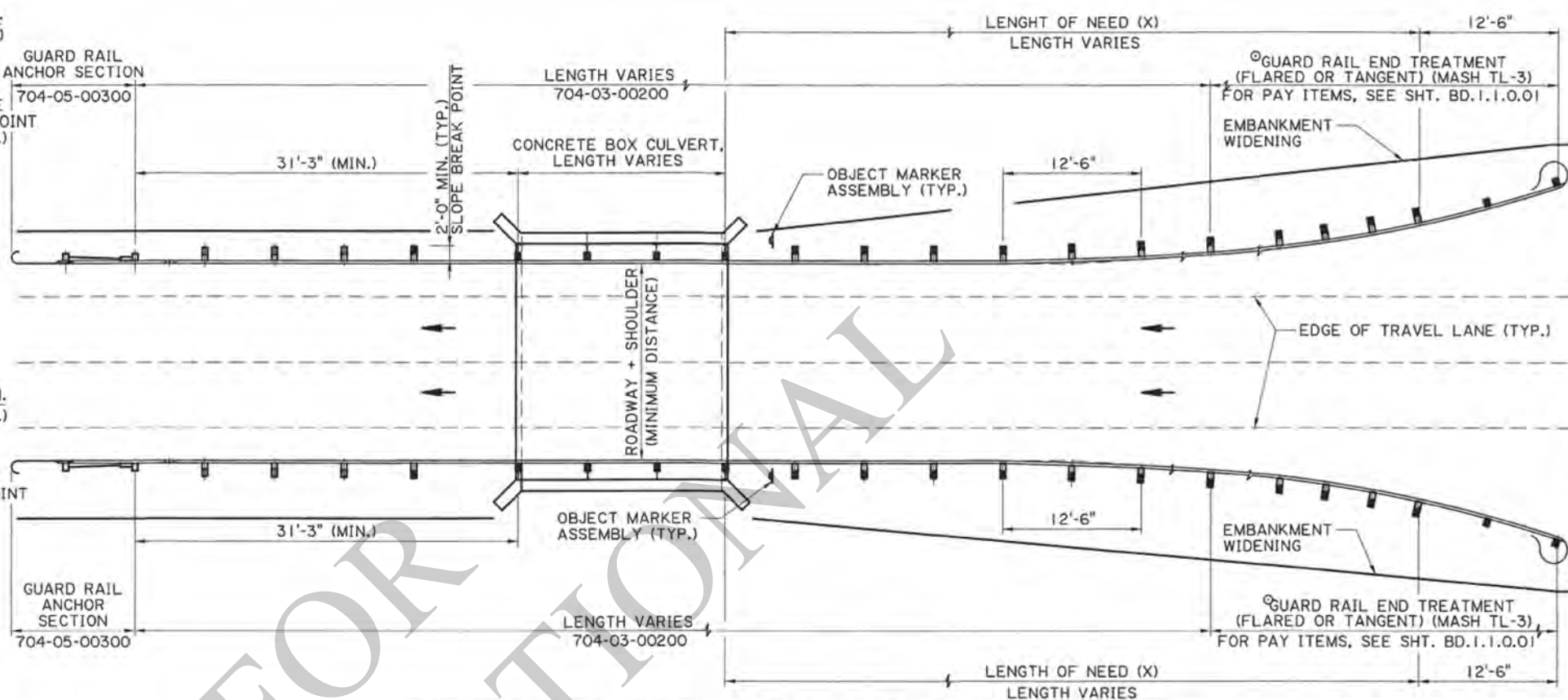
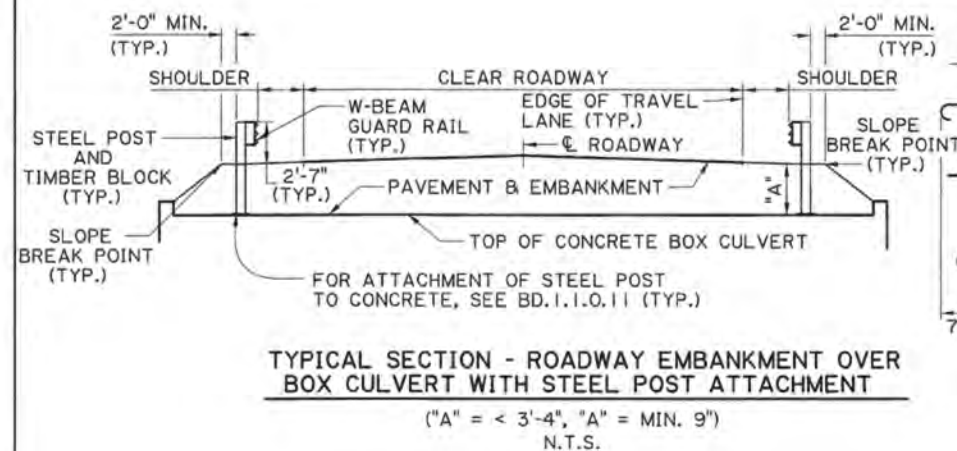
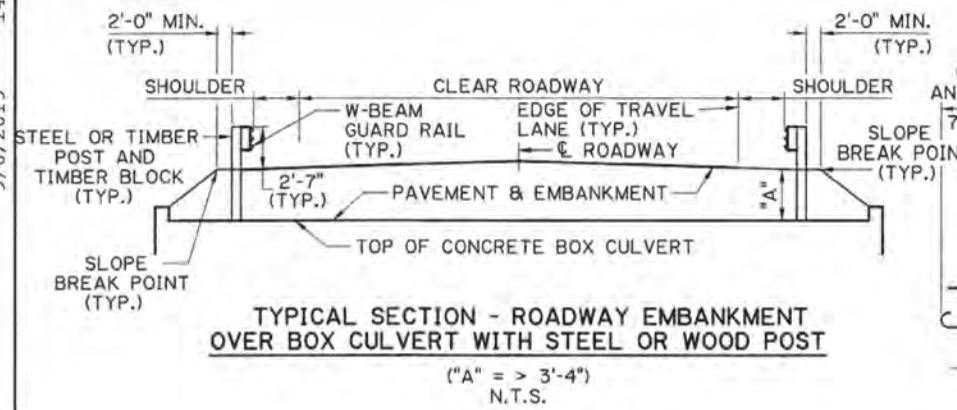
- EXISTING SLOPE SHOWN IS FOR ILLUSTRATION ONLY. (SLOPES VARY AT EACH LOCATION)
- LENGTH OF 54" TALL BARRIER TO BE DETERMINED BY THE LENGTH OF THE OBJECT TO BE PROTECTED.
1/2" OPEN JOINTS TO BE AT 20'-0" MAX. CTRS.
- TRAILING END SHOWN IS FOR USE WITH THE FILL SECTIONS.
FOR TRAILING END ON CUT SECTIONS SEE SHEET 5 OF B.
- SEE SHEET 5 OF B FOR OTHER PIER PROTECTION SYSTEM NOTES.
- REINFORCING STEEL BAR DETAILS THAT ARE SHOWN ARE FOR FABRICATION. STRAIGHT REBAR DETAILS NOT SHOWN, ONLY THE SIZE IS SHOWN IN THE SECTIONS.
- THESE REINFORCING STEEL BAR DIMENSIONS VARY AND SHALL BE ADJUSTED AND FABRICATED TO FIT IN THE TRANSITION AREA.
THIS STANDARD PLAN SHALL BE USED IN CONJUNCTION WITH STANDARD PLAN GR-200.
- SEE BARRIER RAIL SPECIAL DETAILS FOR FURTHER REINFORCING INFORMATION.
- 401 BARS WILL TERMINATE IN TRANSITION SECTION WITH 1/2" REQUIRED BAR CLEARANCE.
- FOOTING WIDTH MAY BE ADJUSTED TO 6" TO FIT AROUND COLUMN INTERFERENCE WHEN NEEDED. ADJUSTMENTS TO BE MADE AT NO ADDITIONAL COST. ANY REVISED DETAILS TO BE APPROVED BY THE ENGINEER

501 & 502
(2 1/2" + PIN)
(502 BAR DIMENSIONS VARY)

SHEET NUMBER	7 OF 8
PARISH	GRASS
FEDERAL PROJECT	P. FOSSIER
STATE PROJECT	OCT-2008
DESIGNED	G. GRASS
CHECKED	P. FOSSIER
DATE	6-13-2017
BY	K.M.B.
REVISION DESCRIPTION	UPDATED FOR 2016 SPECIFICATIONS
DATE	2-15-17
APPROVED BY	Paul B. Fossier, Jr.
CHIEF ENGINEER	
HIGHWAY GUARD RAILS	
BACKFILL SUPPORTED BARRIER	
CUT & FILL SECTION	
BRIDGE AND STRUCTURAL DESIGN	

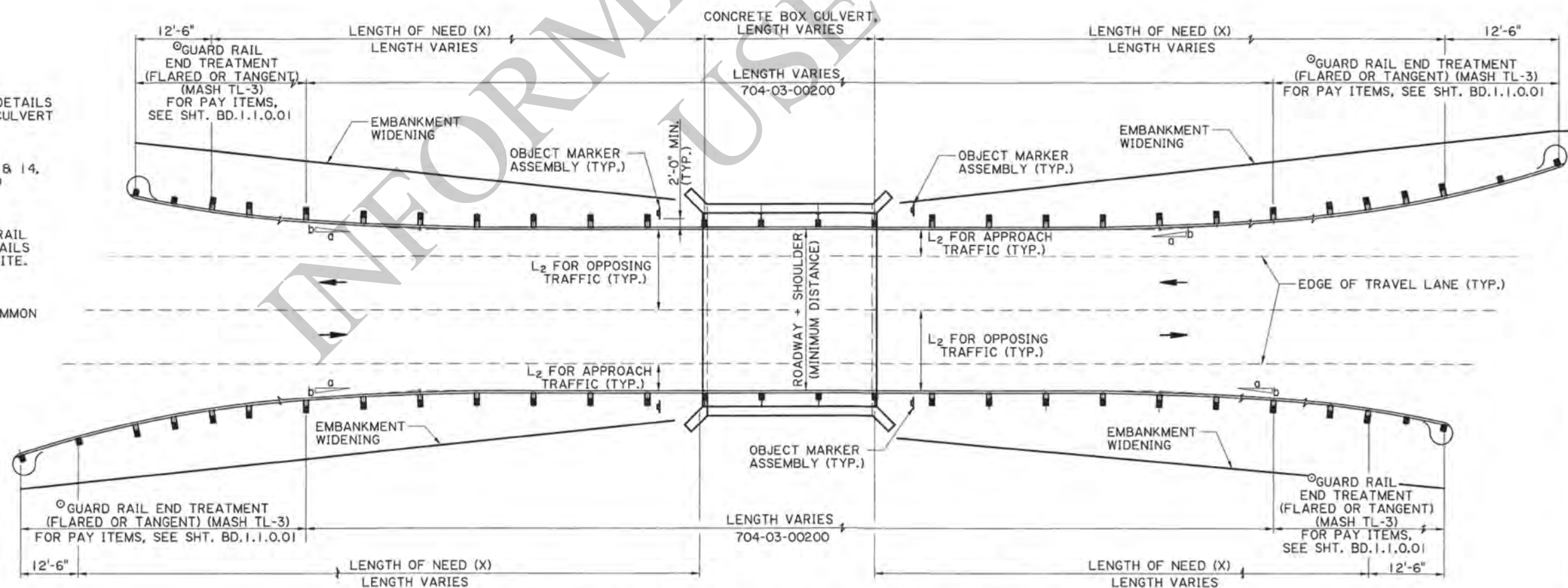


	HIGHWAY GUARD RAILS PIER PROTECTION SYSTEM SELF-SUPPORTING BARRIER (CUT & FILL SECTION)		APPROVED BY CHIEF ENGINEER	DATE 6-13-2017	DATE OCT., 2008	STATE PROJECT	SHEET NUMBER
			GR-201	K.M.B.	G. GRASS	FEDERAL PROJECT	PARISH
			2-15-17	UPDATED FOR 2016 SPECIFICATIONS	DETAILED CHECKED	P. FOSSIER	DESIGNED CHECKED



NOTES:

1. LENGTH OF NEED (X) AND PLAN LAYOUT DETAILS ARE TO BE DETERMINED FOR EACH BOX CULVERT AT EACH SPECIFIC SITE.
2. FOR END TREATMENTS SEE NOTES 9, 13, & 14, ON BD.1.1.0.01. FLARED OR TANGENT END TREATMENT MAY BE USED.
3. IN ADDITION TO THESE DETAILS, GUARD RAIL LAYOUT AND EMBANKMENT WIDENING DETAILS ARE REQUIRED FOR EACH BOX CULVERT SITE. SEE OTHER PLAN DETAILS.
4. FOR ALL OTHER DETAILS, REFERENCE COMMON DETAILS, BD.1.1.0.01 - BD.1.1.0.11.



SHEET NUMBER		PARISH		CONTROL SECTION		STATE PROJECT	
DESIGN	CHECK	DETAIL	CHECK	REVIEW	SERIES	OF	1
P. FOSSIER		K. BRAUNER		J. DOUCET		K. BRAUNER	
C. GUIDRY							

APPROVED BY CHIEF ENGINEER:

[Signature] 1/3/19

DATE

STATE OF LOUISIANA

KURT M. BRAUNER

License No. 35527

PROFESSIONAL ENGINEER

IN

CIVIL ENGINEERING

STATE OF LOUISIANA

ENGINEER

HIGHWAY GUARD RAIL (MASH)

APPLICATION FOR BOX CULVERT

BD.1.3.0.01

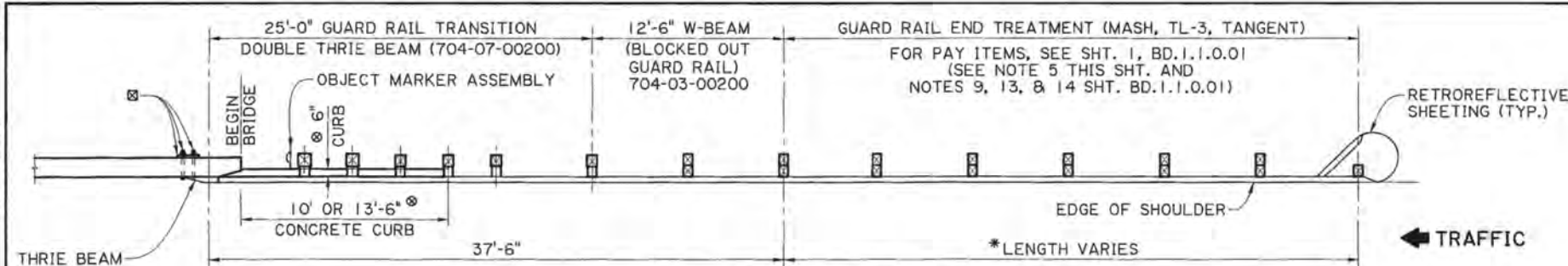
GR-MASH-BC

STANDARD PLAN

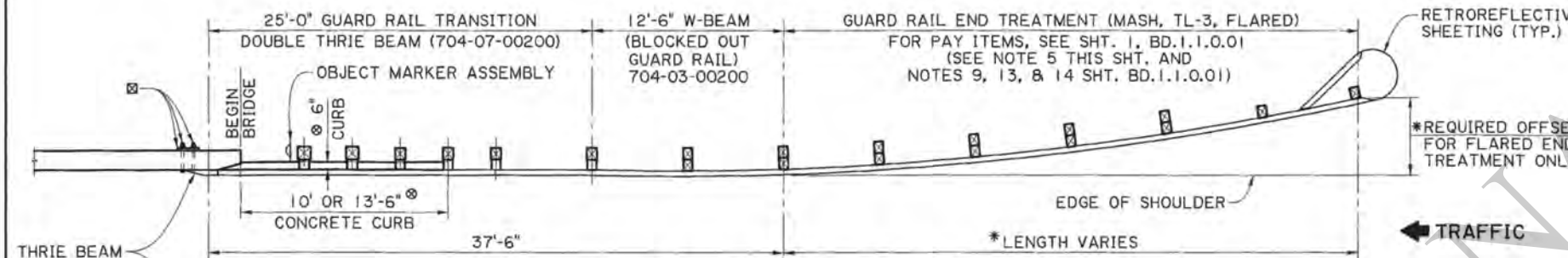
DOTD

LOUISIANA DEPARTMENT OF TRANSPORTATION & DEVELOPMENT

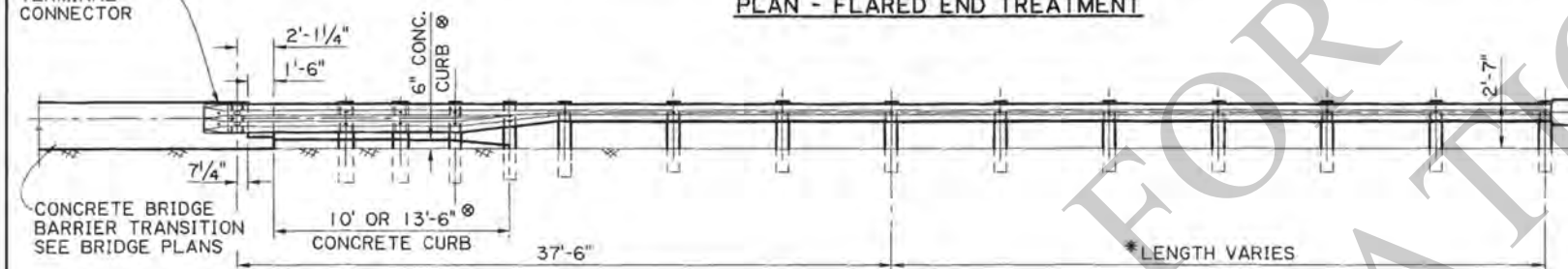
BRIDGE AND STRUCTURAL DESIGN



PLAN - TANGENT END TREATMENT

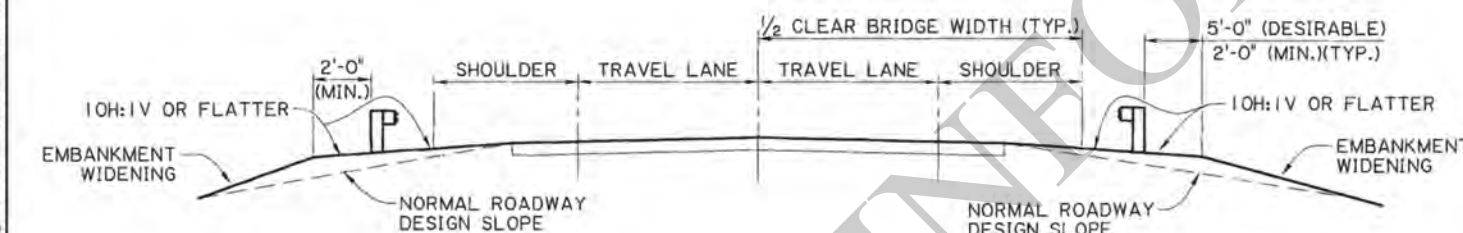


PLAN - FLARED END TREATMENT

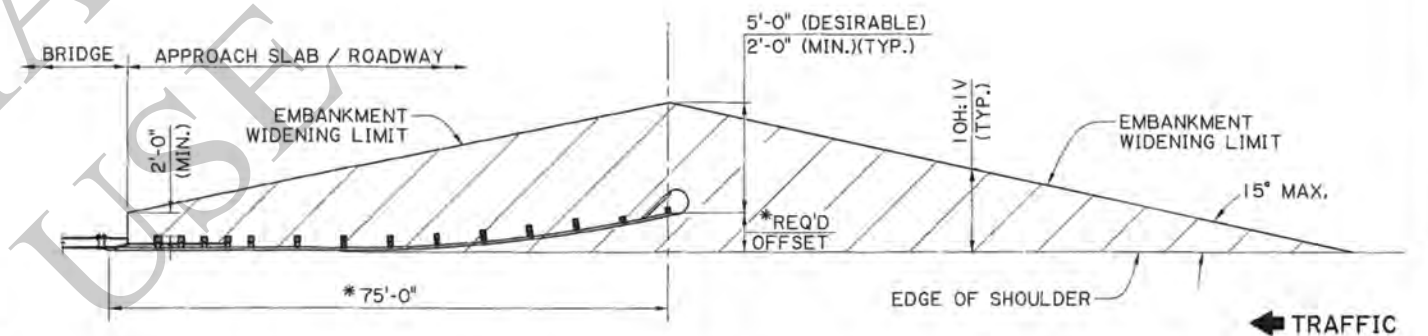


ELEVATION
(NOT TO SCALE)

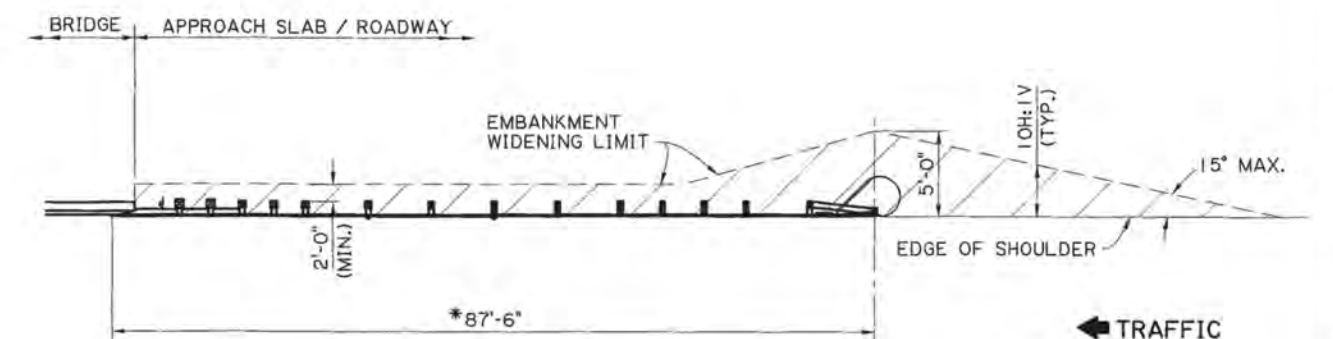
7/8" Ø H.S. HEX. BOLTS WITH 5/8" BEARING PLATE
(SEE STANDARD PLAN BD.1.1.0.09).



TYPICAL CROSS SECTION EMBANKMENT WIDENING
(NOT TO SCALE)



TYPICAL PLAN FOR EMBANKMENT WIDENING - FLARED END TREATMENT
(TYPICAL FOR EACH END OF BRIDGE)
(NOT TO SCALE)



TYPICAL PLAN FOR EMBANKMENT WIDENING - TANGENT END TREATMENT
(TYPICAL FOR EACH END OF BRIDGE)
(NOT TO SCALE)

NOTES

- 1) FOR ADDITIONAL GUARD RAIL DETAILS AND INFORMATION, SEE STANDARD PLAN BD.1.1.0.01 THRU BD.1.1.0.11.
- 2) FOR CONCRETE BRIDGE BARRIER TRANSITION DETAILS, SEE BRIDGE PLANS.
- 3) OBJECT MARKERS (TYPE 3) SHALL BE PAID UNDER ITEM 729-16-00300.
- 4) THE QUANTITY FOR THE EMBANKMENT WIDENING AT BRIDGE ENDS SHALL BE INCLUDED IN THE EMBANKMENT QUANTITY FOR THE ROADWAY.
- * 5) USE REQUIRED OFFSET AS PER GUARD RAIL FLARED END TREATMENT REQUIREMENTS. SEE DOTD APPROVED MATERIALS LIST (AML) FOR GUARD RAIL END TREATMENTS (MASH). LENGTH VARIES BASED ON END TREATMENT TYPE USED.
- * 6) USE 10'-0" LONG CONCRETE CURB AND 6" CURB HEIGHT FOR 10' APPROACH SLAB, SEE APPROACH SLAB DETAILS FOR FURTHER INFORMATION.

USE 13'-6" LONG CONCRETE CURB FOR ≥ 20' APPROACH SLAB, CURB HEIGHT VARIES FROM 6" TO 2", SEE APPROACH SLAB DETAILS FOR FURTHER INFORMATION.

SHEET NUMBER		PARISH		CONTROL SECTION		STATE PROJECT	
DESIGN	P. FOSSIER	CHECK	K. BRAUNER	DETAIL	J. DOUCET	CHECK	K. BRAUNER
REVIEW	C. GUIDRY	SERIES	1 OF 1				

STATE OF LOUISIANA

KURT M. BRAUNER

License No. 30567

PROFESSIONAL ENGINEER

IN

CIVIL ENGINEERING

12/18/19

APPROVED BY CHIEF ENGINEER:

1/13/19

DATE:

1/13/19

STANDARD PLAN

GR-MASH-OFF

HIGHWAY GUARD RAIL (MASH) OFF-SYSTEM BRIDGE APPLICATION

DOTD

LOUISIANA DEPARTMENT OF TRANSPORTATION & DEVELOPMENT

BRIDGE AND STRUCTURAL DESIGN

13:20
3/1/2023
IP_PWP:G1074021\BD.1.1.0.01 - HIGHWAY GUARD RAIL (MASH).dgn

GUARD RAIL GENERAL NOTES:

- DESIGN REFERENCE: THE LATEST EDITIONS OF THE AASHTO ROADSIDE DESIGN GUIDE (RDG) AND THE LADOTD BRIDGE DESIGN AND EVALUATION MANUAL (BDEM), PART II, VOLUME 4 - HIGHWAY SAFETY.
- GUARD RAIL LENGTH: TOTAL GUARD RAIL LENGTH AND LENGTH OF NEED SHALL BE BASED ON THE LATEST AASHTO ROADSIDE DESIGN GUIDE LENGTH OF NEED REQUIREMENTS. TOTAL LENGTH OF GUARD RAIL SHALL NOT BE LESS THAN 75'-0" BASED ON A LENGTH OF LENGTH OF NEED OF X=62'-6". A DESIGN WAIVER IS REQUIRED FOR GUARD RAIL LENGTHS NOT MEETING THESE REQUIREMENTS.
- FOR BRIDGES WITH GUARD RAILS IN URBAN AREAS WITH A DESIGN SPEED OF 45 MPH OR LESS, SEE DOTD EDSM NO. II.3.1.4 FOR DESIGN INFORMATION.
- FOR GUARD RAIL ON EXISTING HIGHWAYS, SEE DOTD EDSM NO. II.3.1.3 FOR DESIGN INFORMATION.
- EMBANKMENT WIDENING IS TO PROVIDE SLOPES NOT STEEPER THAN 10H:1V IN FRONT OF THE GUARD RAIL.
- ALL GUARD RAIL COMPONENTS SHALL BE IN ACCORDANCE WITH THE PROJECT SPECIFIC PLAN LAYOUT DETAILS, GUARD RAIL DESIGN DATA, PAY ITEMS, AND QUANTITY TABLES PROVIDED IN THE PROJECT PLANS.
- LONGITUDINAL DIMENSIONS FOR GUARD RAIL ARE MEASURED ALONG THE PROJECTED FACE OF RAILING.
- THE QUANTITY FOR THE EMBANKMENT WIDENING IS TO BE INCLUDED IN THE EMBANKMENT PAY ITEM QUANTITY FOR THE ROADWAY.
- A TANGENT END TREATMENT MAY BE USED AS AN ALTERNATE TO THE FLARED END TREATMENT. A ZERO FLARE RATE ($b/a=0$) IS REQUIRED WHEN THE TANGENT END TREATMENT IS USED AND THE LENGTH OF NEED "X" SHALL BE CALCULATED BASED ON A "ZERO" FLARE RATE.
- THE POINT WITHIN THE GUARD RAIL END TREATMENT WHERE THE LENGTH OF NEED TERMINATES MAY VARY WITH EACH TYPE OF GUARD RAIL END TREATMENT. THE 12'-6" LENGTH APPLIES TO MOST END TREATMENTS.
- RETROREFLECTIVE ADHESIVE SHEETING (12" X 2'-8") (TYPE III HIGH INTENSITY OBJECT MARKER PATTERN) SHALL BE APPLIED TO THE END TREATMENT NOSE. SEE THE LATEST LA. STANDARD SPECS. FOR ROADS AND BRIDGES FOR SPECIFICATIONS AND THE SHEETING MANUFACTURER'S RECOMMENDATIONS FOR INSTALLATION. FOR PATTERN DETAIL, SEE OBJECT MARKER STANDARD PLANS.
- GUARD RAIL INSTALLATIONS MAY BE PAVED BY USING CONCRETE PAVING OR ASPHALT CONCRETE. THE INCIDENTAL CONCRETE OR ASPHALT WILL BE USED IF A LAYOUT DETAIL, PAY ITEM, AND QUANTITY IS INDICATED IN THE PLANS. SEE SHEET II FOR REQUIRED POST DETAILS WHEN PAVING IS USED AROUND POSTS.
- GUARD RAIL END TREATMENTS SHALL BE SELECTED FROM THE DOTD APPROVED MATERIALS LIST (AML), AND SHALL BE AASHTO MASH, TEST LEVEL 3 (TL-3) UNLESS OTHERWISE NOTED IN THE PLANS. IF TEST LEVEL 2 (TL-2) GUARD RAIL END TREATMENTS ARE USED, A DESIGN WAIVER SHALL BE REQUIRED. IF MASH FLARED END TREATMENTS ARE NOT AVAILABLE, USE GUARD RAIL END TREATMENT, NCHRP 350 - 31" (TL-3 FLARED), WITH APPROVAL OF PROJECT ENGINEER.
- FLARED GUARD RAIL END TREATMENTS (12'-6" OR 18'-9"), (PAY ITEMS 704-10-00105 AND 704-10-00110) ARE GENERIC TEST LEVEL 2 (TL-2) NCHRP 350 SYSTEMS THAT CAN ONLY BE USED WITH PERMISSION FROM THE BRIDGE DESIGN ENGINEER ADMINISTRATOR AND AN APPROVED DESIGN WAIVER. SEE BRIDGE DESIGN SPECIAL DETAILS FOR THESE END TREATMENT DETAILS.
- GUARD RAIL DESIGN VARIABLES FOR STANDARD PLAN SHEETS:
 - L_1 = LENGTH OF TANGENT SECTION OF RAIL IN ADVANCE OF OBJECT. (FT)
 - L_2 = DISTANCE FROM EDGE OF TRAVEL LANE TO TANGENT SECTION OF RAIL. (FT)
 - L_3 = DISTANCE FROM EDGE OF TRAVEL LANE TO OBJECT OF CONCERN.
 - L_R = RUNOUT LENGTH (FT)
 - L_C = REQUIRED CLEAR ZONE (FT)
 - L_A = DISTANCE FROM THE EDGE OF THE TRAVEL LANE TO THE LATERAL EXTENT OF THE OBJECT. (FT)
 - $L_A = L_C$ FOR BRIDGE APPLICATIONS
 - X = CALCULATED LENGTH OF NEED (FT)
 - Y = DISTANCE FROM EDGE OF THE TRAVEL LANE TO THE BEGINNING OF THE LENGTH OF NEED.
 - Z = DISTANCE FROM EDGE OF THE TRAVEL LANE TO THE EDGE OF EMBANKMENT.
 - b/a = FLARE RATE (VERTICAL/HORIZONTAL)FOR CLEAR ZONE, RUNOUT, FLARE RATE, SHYLINE, AND HORIZONTAL CURVE ADJUSTMENTS, SEE LATEST AASHTO ROADSIDE DESIGN GUIDE AND THE DOTD BRIDGE DESIGN AND EVALUATION MANUAL.
- STEEL POSTS MAY BE USED AS AN ALTERNATE TO WOOD POSTS, UNLESS SHOWN OTHERWISE.
- INTERMIXING OF STEEL AND WOOD POSTS IN ANY ONE SECTION OF THE GUARD RAIL SHALL NOT BE PERMITTED.
- ALL MATERIAL DIMENSIONS ARE SUBJECT TO MANUFACTURING TOLERANCES.
- GUARD RAIL HEIGHT TOLERANCE ALLOWED FOR INSTALLATION IS 1 INCH ABOVE AND 0.5 INCH BELOW THE SPECIFIED HEIGHT.
- GUARD RAIL TRAILING END ANCHORAGE SHALL BE USED TO ANCHOR DOWNSTREAM END OF GUARD RAIL ONLY WHEN TYPICAL GUARD RAIL END TREATMENTS ARE NOT REQUIRED.
- STANDARD COMPONENTS: STANDARD GUARD RAIL COMPONENTS, INCLUDING POSTS, PANELS, AND BOLT SYSTEM ARE BASED UPON ENGLISH UNIT CONVERSIONS OF THE AASHTO-AGC-ARTBA JOINT COMMITTEE TASK FORCE I3 REPORT: A GUIDE TO STANDARDIZED HIGHWAY BARRIER HARDWARE.
- IF OFF-SYSTEM BRIDGE OR BOX CULVERT DETAILS ARE USED, THE PLANS MUST ALSO INCLUDE THE COMMON DETAILS (SHTS. I-III).

GUARD RAIL AND RELATED PAY ITEMS :

- 202-02-14500 REMOVAL OF GUARD RAIL, (LN FT)
- 704-01-01000 GUARD RAIL (SINGLE THRIE BEAM) (3'-1 1/2" POST SPACING), (LN FT)
- 704-01-01020 GUARD RAIL (SINGLE THRIE BEAM) (6'-3" POST SPACING), (LN FT)
- 704-01-02000 GUARD RAIL (DOUBLE THRIE BEAM) (3'-1 1/2" POST SPACING), (LN FT)
- 704-01-02020 GUARD RAIL (DOUBLE THRIE BEAM) (6'-3" POST SPACING), (LN FT)
- 704-03-00200 BLOCKED OUT GUARD RAIL - 31", (6'-3" POST SPACING), (LN FT)
- 704-04-00200 BLOCKED OUT GUARD RAIL - 31", (DOUBLE FACED, 6'-3" POST SPACING), (LN FT)
- 704-05-00300 GUARD RAIL ANCHOR SECTIONS - 31", (TRAILING END), (LN FT)
- 704-06-00100 GUARD RAIL BRIDGE ATTACHMENTS, (LN FT)
- 704-06-00200 GUARD RAIL BRIDGE ATTACHMENTS (SINGLE THRIE BEAM), (LN FT)
- 704-07-00200 GUARD RAIL TRANSITION, (DOUBLE THRIE BEAM), (LN FT)
- 704-09-00100 GUARD RAIL ANCHOR BLOCK, (EA.)
- 704-10-00105 GUARD RAIL END TREATMENT (FLARED, 12'-6" LENGTH), (EA.)
- 704-10-00110 GUARD RAIL END TREATMENT (FLARED, 18'-9" LENGTH), (EA.)
- 704-10-00120 GUARD RAIL END TREATMENT, MASH, (TL-3 FLARED), (EA.)
- 704-10-00204 GUARD RAIL END TREATMENT, MASH, (TL-2 TANGENT), (EA.)
- 704-10-00205 GUARD RAIL END TREATMENT, MASH, (TL-3 TANGENT), (EA.)
- 704-10-00305 GUARD RAIL END TREATMENT, MASH, (TL-3 BI-DIRECTIONAL), (EA.)
- 704-10-00310 GUARD RAIL END TREATMENT, NCHRP 350 - 31" (TL-3 FLARED), (EA.)
- 810-06-00100 CONCRETE PIER PROTECTION SYSTEM (VEHICLE), (LN FT)
- SEE NOTE NO.13
- SEE NOTE NO.14

GUARD RAIL STANDARD PLAN INDEX		
	BRIDGE STANDARD INDEX NO.	DESCRIPTION
COMMON DETAILS BRIDGE END AND NON-BRIDGE APPLICATIONS	BD.1.1.0.01	GENERAL NOTES, PAY ITEMS, STANDARD PLAN INDEX
	BD.1.1.0.02	BRIDGE APPLICATION, TYPICAL LAYOUT
	BD.1.1.0.03	THRIE BEAM GUARD RAIL TRANSITION TO BRIDGE RAIL
	BD.1.1.0.04	NON BRIDGE APPLICATION, TYPICAL LAYOUT
	BD.1.1.0.05	NON BRIDGE APPLICATION, TYPICAL LAYOUT
	BD.1.1.0.06	TYPICAL DETAILS AND SECTIONS
	BD.1.1.0.07	TRAILING END DETAILS
	BD.1.1.0.08	TRAILING END DETAILS
	BD.1.1.0.09	RAIL STRUCTURAL DETAILS
	BD.1.1.0.10	GUARD RAIL POST AND BLOCK DETAILS
	BD.1.1.0.11	MISCELLANEOUS DETAILS, MOW STRIPS AND CONCRETE ANCHORS
* OFF - SYSTEM BRIDGE	BD.1.2.0.01	OFF-SYSTEM BRIDGE GUARD RAIL DETAILS
* BOX CULVERT DETAILS	BD.1.3.0.01	BOX CULVERT GUARD RAIL DETAILS

SHEET NUMBER

PARISH

CONTROL SECTION

STATE PROJECT

P. FOSSIER

K. BRAUNER

J. DOUCET

K. BRAUNER

C. GUIDRY

DESIGN

CHECK

DETAIL

CHECK

REVIEW

SERIES

I OF II

STATE OF LOUISIANA

KURT M. BRAUNER

License No. 20567

PROFESSIONAL ENGINEER

IN

CIVIL ENGINEERING

4/13/2023

APPROVED BY CHIEF ENGINEER:

DATE:

4/13/2023

STATE OF LOUISIANA

CONFIDENTIAL

HIGHWAY GUARD RAIL (MASH)

GENERAL NOTES, PAY ITEMS

AND STANDARD PLAN INDEX

BD.1.1.0.01

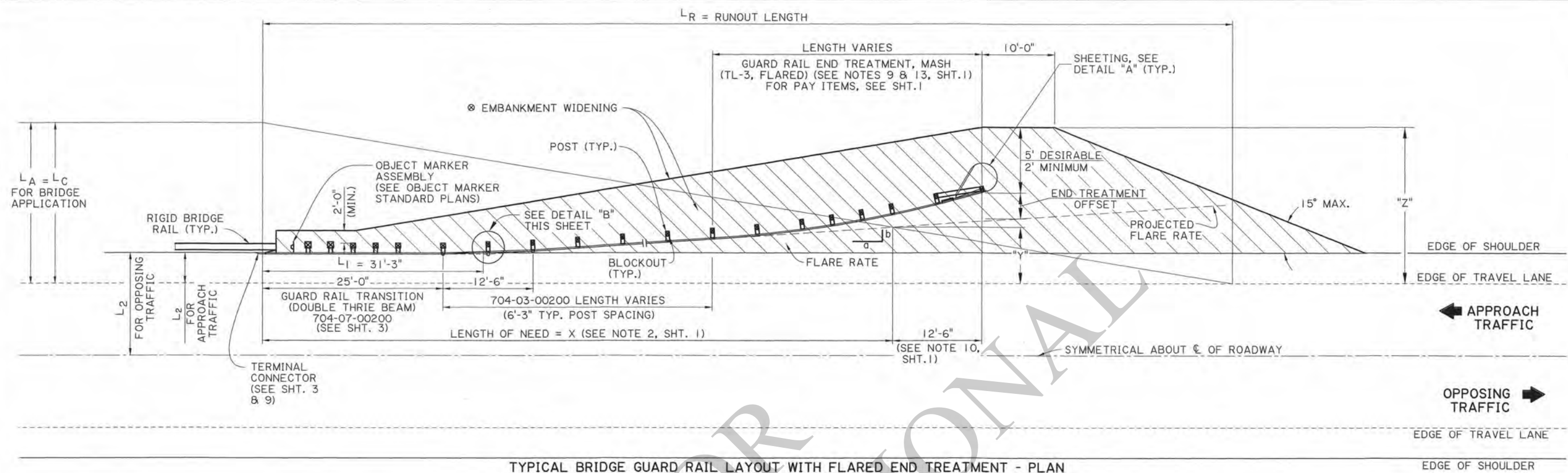
GR-MASH-ON

STANDARD PLAN

DOTD

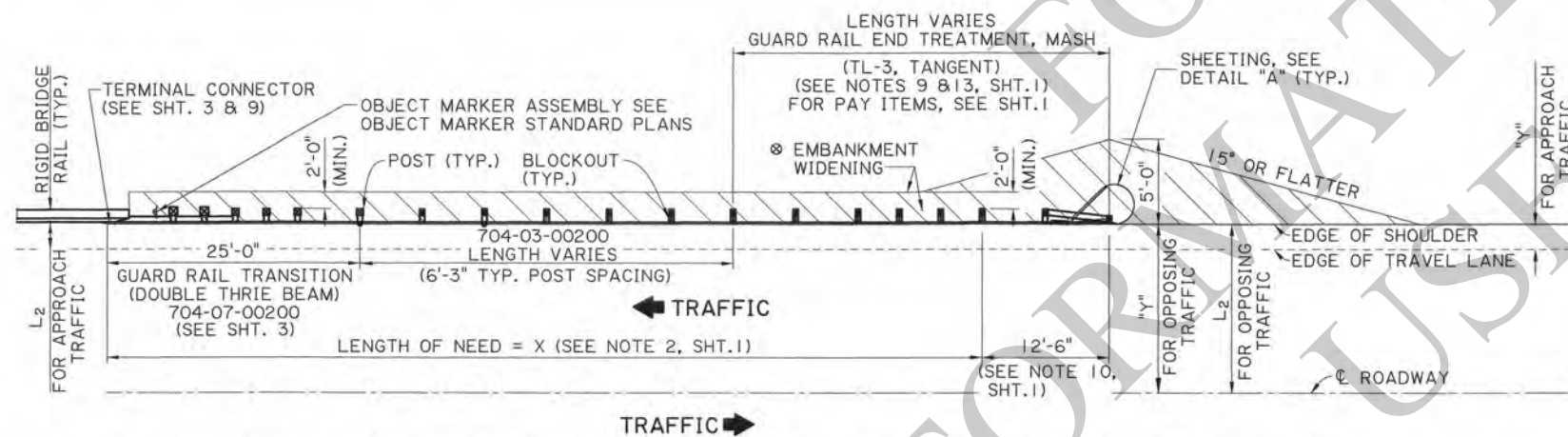
LOUISIANA DEPARTMENT OF TRANSPORTATION & DEVELOPMENT

BRIDGE AND STRUCTURAL DESIGN



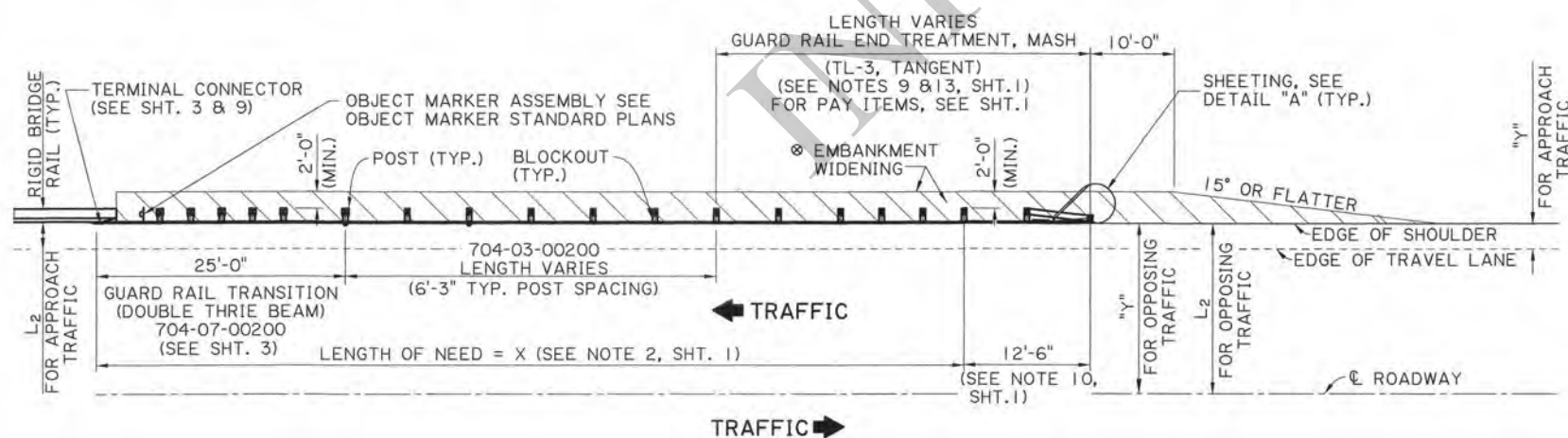
TYPICAL BRIDGE GUARD RAIL LAYOUT WITH FLARED END TREATMENT - PLAN

NOTE: LAYOUT SIMILAR FOR OTHER QUADRANTS OF BRIDGE END
 ⊗ SEE NOTES 5, 8, AND 12, SHT. 1.



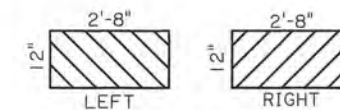
TYPICAL BRIDGE GUARD RAIL LAYOUT WITH TANGENT END TREATMENT - PREFERRED GRADING - PLAN

⊗ SEE NOTES 5, 8, AND 12, SHT. 1.

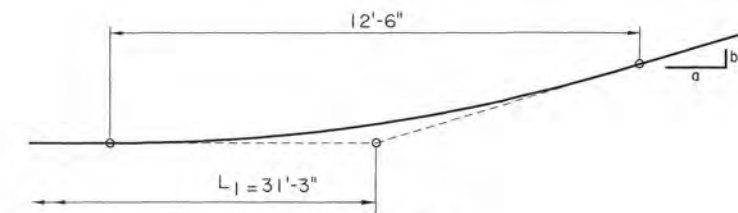


TYPICAL BRIDGE GUARD RAIL LAYOUT WITH TANGENT END TREATMENT - ALTERNATIVE GRADING - PLAN

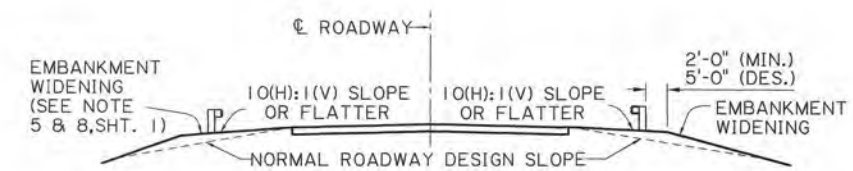
⊗ SEE NOTES 5, 8, AND 12, SHT. 1.



DETAIL "A"
RETROREFLECTIVE SHEETING
(SEE SHT. 1 NOTE 11)



DETAIL "B"



TYPICAL EMBANKMENT WIDENING SECTION

NOTES:

THE DETAILS SHOWN ON THIS SHEET SHALL BE USED TO CONNECT GUARD RAIL TO RIGID BRIDGE RAILS. DETAILS FOR CONNECTING TO A FLEXIBLE BRIDGE RAIL ARE SHOWN ON STANDARD PLAN GRR-06, "APPROACH GUARD RAIL FOR STRUCTURES WITH FLEXIBLE RAILS."

DESIGN	P. FOSSIER	PARISH			SHEET NUMBER
CHECK	K. BRAUNER				
DETAIL	J. DOUGET	CONTROL SECTION			
CHECK	K. BRAUNER				
REVIEW	C. GUIDRY	STATE PROJECT			
SERIES	2 OF 11				

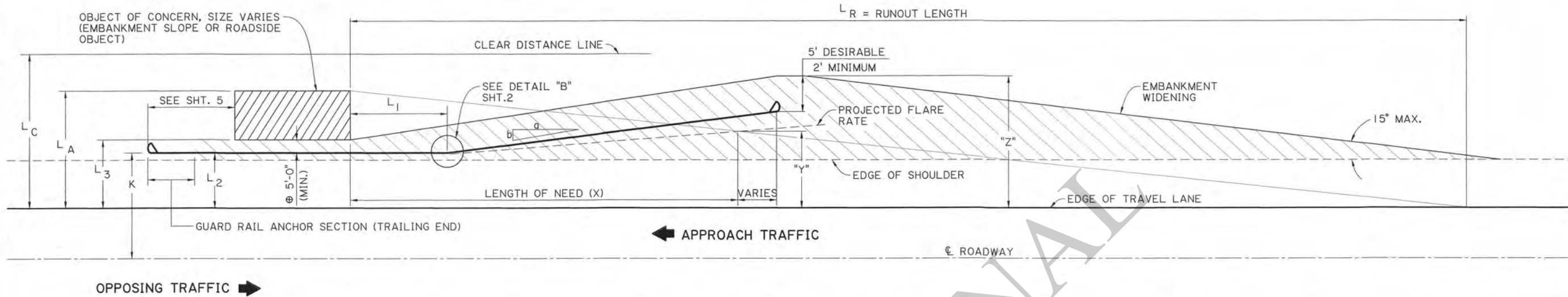


DATE: 4/13/2023



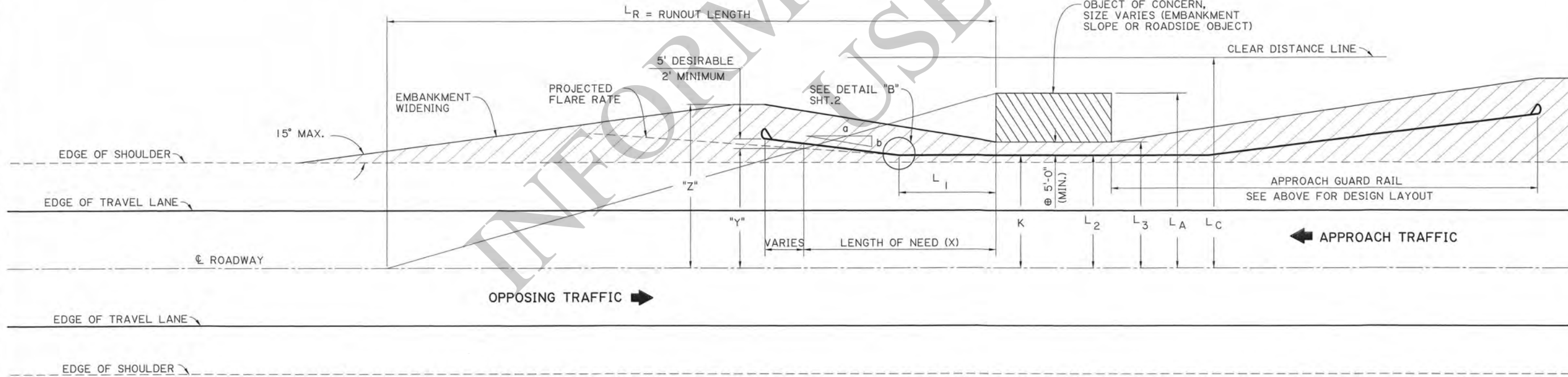
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GR-MASH-ON	
HIGHWAY GUARD RAIL (MASH) BRIDGE APPLICATION (TYPICAL LAYOUT)	





GUARD RAIL LAYOUT FOR SHOULDER APPLICATIONS - APPROACH VARIABLES
(GUARD RAIL OUTSIDE OF OPPOSING TRAFFIC'S CLEAR ZONE ; $K > L_C$)
N.T.S.

⊕ MINIMUM DISTANCE MEASURED FROM BACK FACE OF GUARD RAIL TO FRONT FACE OF OBJECT OF CONCERN.
LAYOUT FOR TANGENT GUARD RAIL SECTIONS AND END TREATMENTS SIMILAR. FOR EMBANKMENT WIDENING DETAILS, SEE SHT. NO. 2.



GUARD RAIL LAYOUT FOR SHOULDER APPLICATIONS - OPPOSING VARIABLES
(GUARD RAIL INSIDE OF OPPOSING TRAFFIC'S CLEAR ZONE ; $K < L_C$)
N.T.S.

SHEET NUMBER	
DESIGN	P. FOSSIER
CHECK	K. BRAUNER
DETAIL	J. DOUCET
CHECK	K. BRAUNER
REVIEW	C. GUIDRY
SERIES	4 OF 11

STATE OF LOUISIANA
KURT M. BRAUNER
License No. 33567
PROFESSIONAL ENGINEER
IN
CIVIL ENGINEERING
KMB
3/2/23

APPROVED BY CHIEF ENGINEER:
Christy P. Hobbs
4/13/2023
DATE:

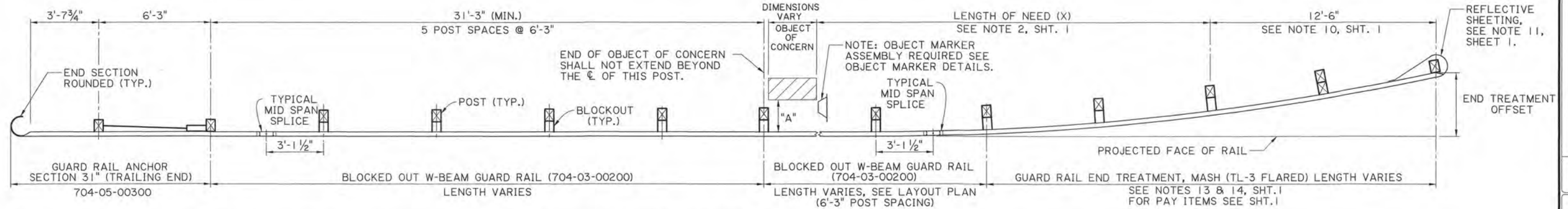
STATE OF LOUISIANA
CONFIDENTIAL

HIGHWAY GUARD RAIL (MASH)
NON-BRIDGE APPLICATION
(TYPICAL LAYOUT)

BD.1.1.0.04
GR-MASH-ON
STANDARD PLAN

DOTD
LOUISIANA DEPARTMENT OF
TRANSPORTATION & DEVELOPMENT

BRIDGE AND
STRUCTURAL
DESIGN

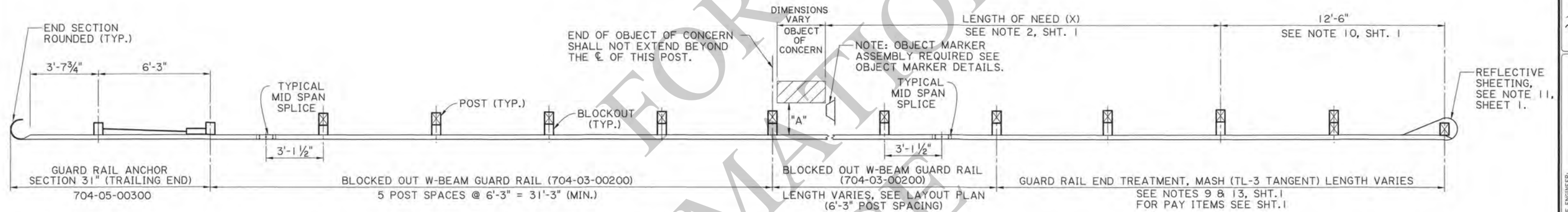


FOR TRAILING END TERMINAL DETAILS AND NOTES, SEE SHTS. 7 & 8.

BACK FACE OF GUARD RAIL TO FRONT FACE OF OBJECT = "A" = 5'-0" MIN.

PLAN - NON-BRIDGE END APPLICATION - FLARED

N.T.S.

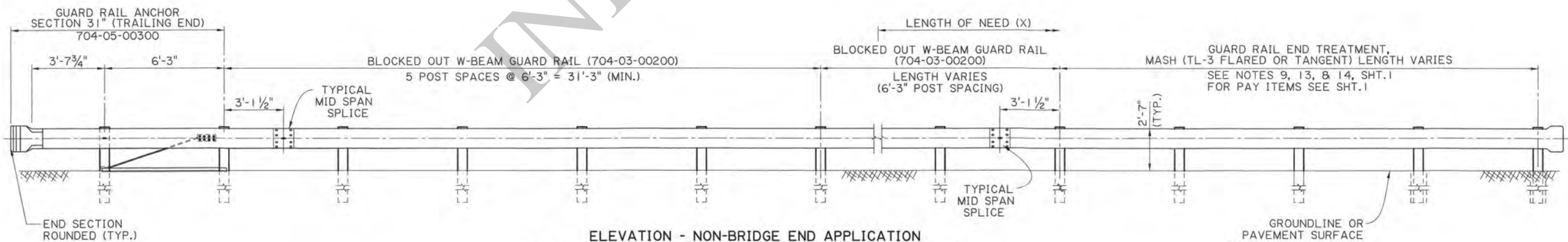


FOR TRAILING END TERMINAL DETAILS AND NOTES, SEE SHTS. 7 & 8.

BACK FACE OF GUARD RAIL TO FRONT FACE OF OBJECT = "A" = 5'-0" MIN.

PLAN - NON-BRIDGE END APPLICATION - TANGENT

N.T.S.



ELEVATION - NON-BRIDGE END APPLICATION

FOR POST, BLOCKOUTS AND GUARD RAIL DETAILS, SEE SHTS. 6, 9, 10, & 11
N.T.S.

SHEET NUMBER		PARISH		SECTION		STATE PROJECT	
DESIGN	P. FOSSIER	CHECK	K. BRAUNER	DETAIL	J. DOUCET	REVIEW	C. GUIDRY
SERIES		5 OF 11					



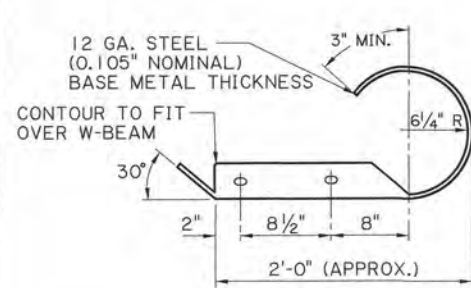
APPROVED BY CHIEF ENGINEER:
Christopher P. Halls
DATE: 4/13/2023



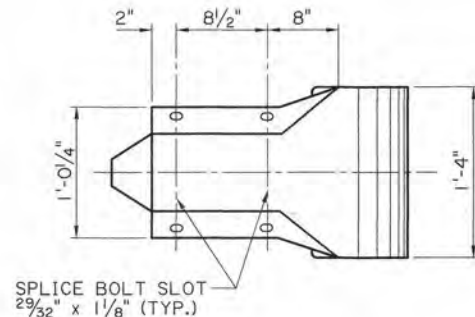
HIGHWAY GUARD RAIL (MASH)
NON-BRIDGE APPLICATION
(TYPICAL LAYOUT)



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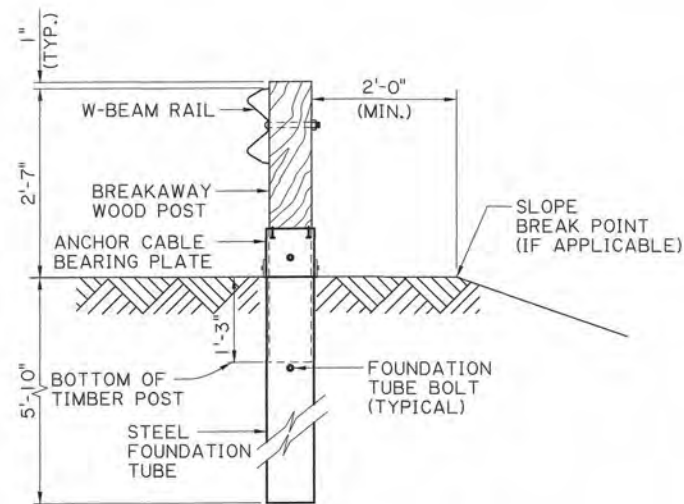


PLAN VIEW

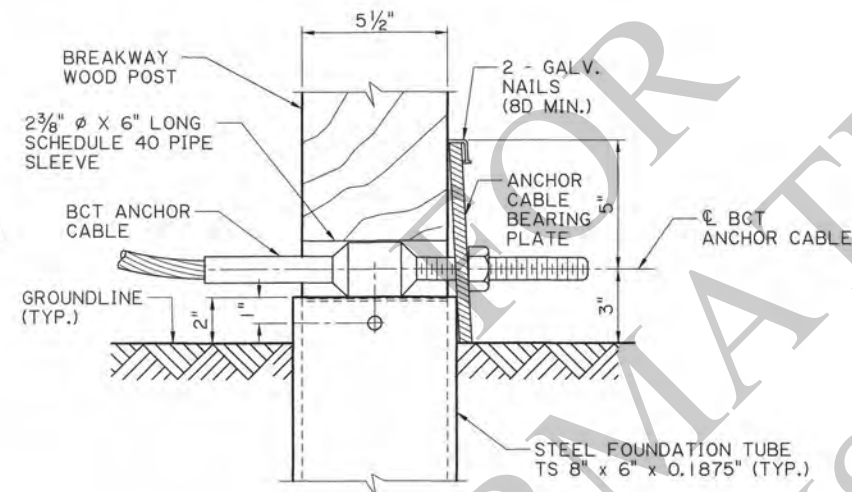


FRONT VIEW

W BEAM END SECTION ROUNDED
N.T.S.



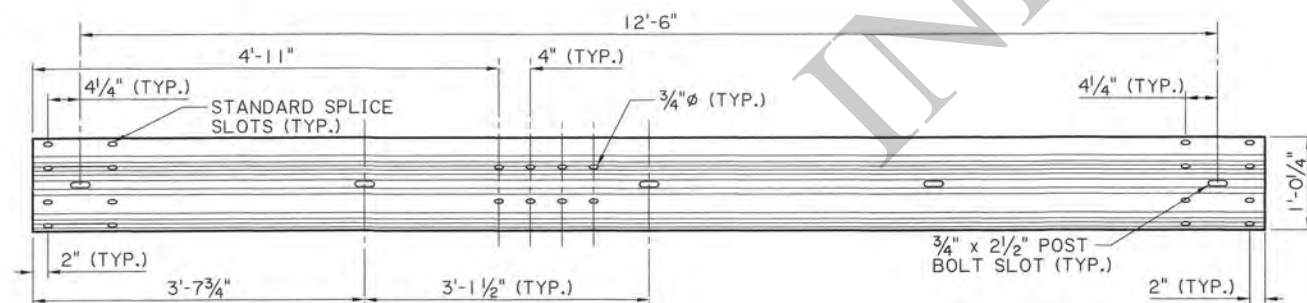
SECTION A-A - POST No. 1
N.T.S.



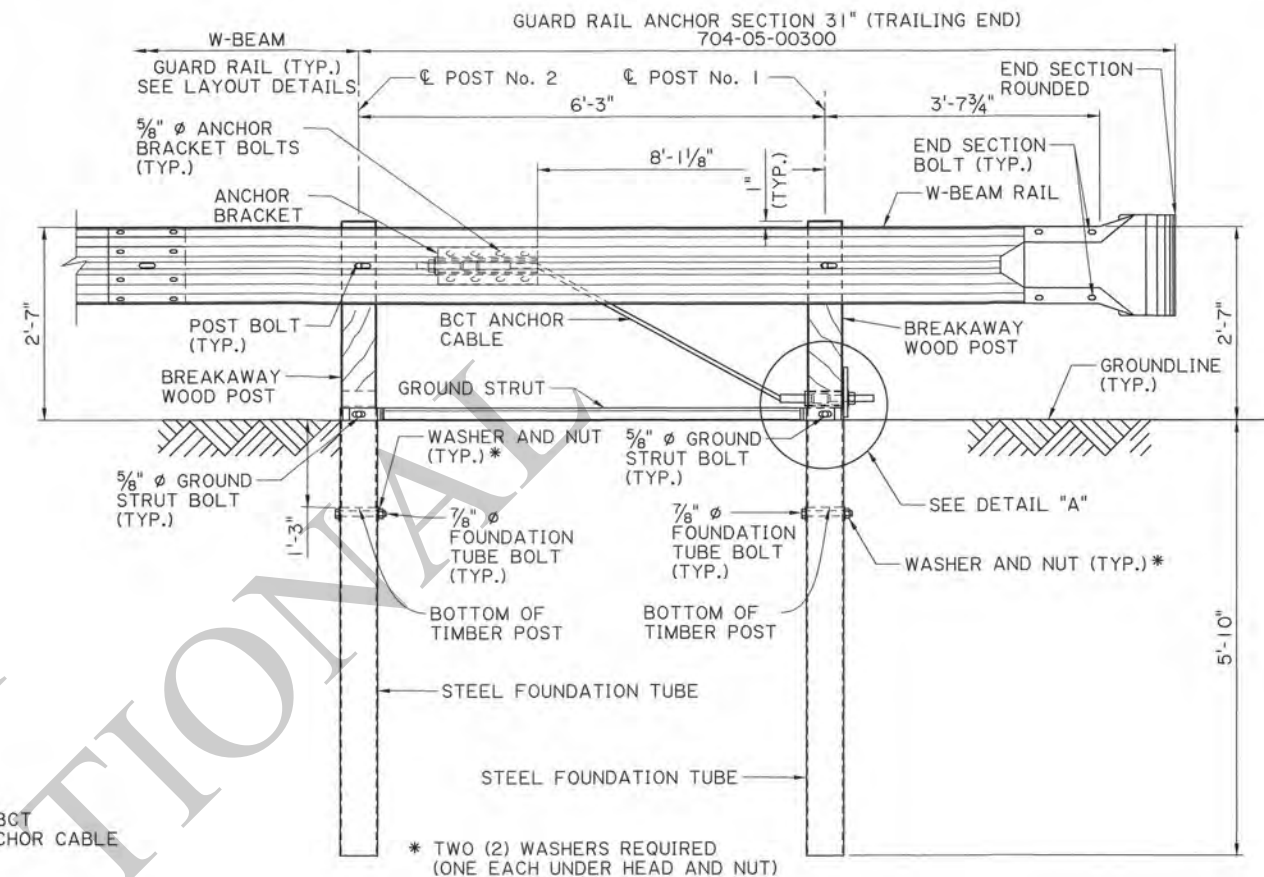
DETAIL "A" - POST No. 1

POST #1 GROUND STRUT NOT SHOWN FOR CLARITY.
POST #2 SIMILAR W/O BCT ANCHOR CABLE AND BEARING PLATE.

N.T.S.

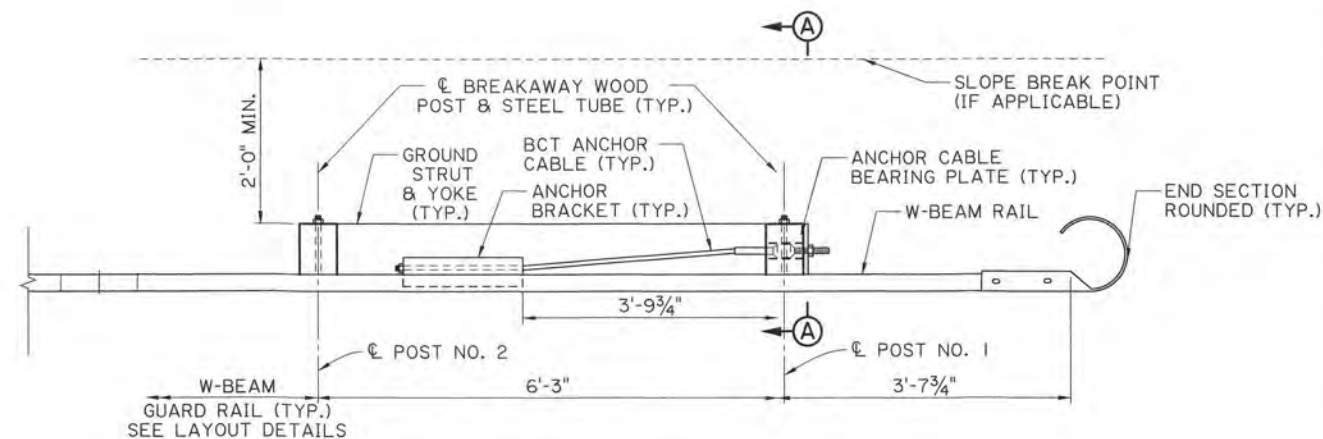


TYPICAL 12'-6" W-BEAM SECTION, 12 GAUGE, TRAILING END SECTION
N.T.S.



TRAILING END RAIL DETAIL - ELEVATION

NOTE: FOR OTHER TRAILING END TERMINAL DETAILS, SEE SHT. 8 OF 11.
N.T.S.



TRAILING END RAIL DETAIL - PLAN
N.T.S.

SHEET NUMBER	
DESIGN	P. FOSSIER
CHECK	K. BRAUNER
DETAIL	J. DOUCET
CHECK	K. BRAUNER
REVIEW	C. GUIDRY
SERIES	7 OF 11

STATE OF LOUISIANA
KURT M. BRAUNER
License No. 30567
PROFESSIONAL ENGINEER
IN
CIVIL ENGINEERING
4/13/2023

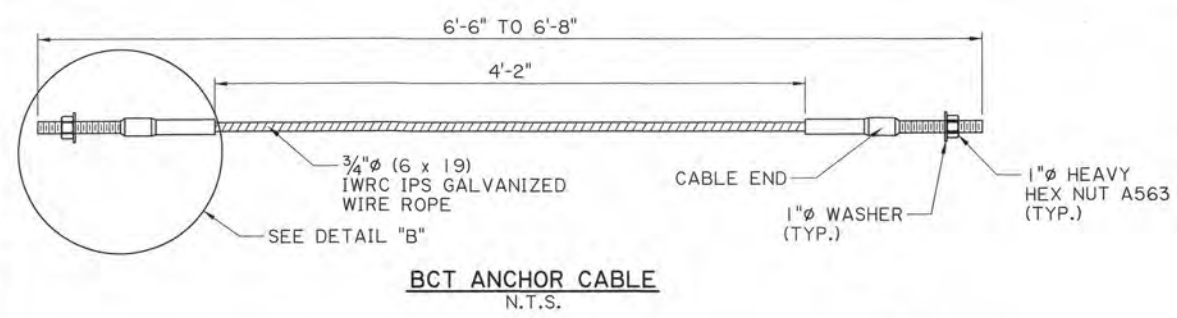
APPROVED BY CHIEF ENGINEER:
4/13/2023

STATE OF LOUISIANA
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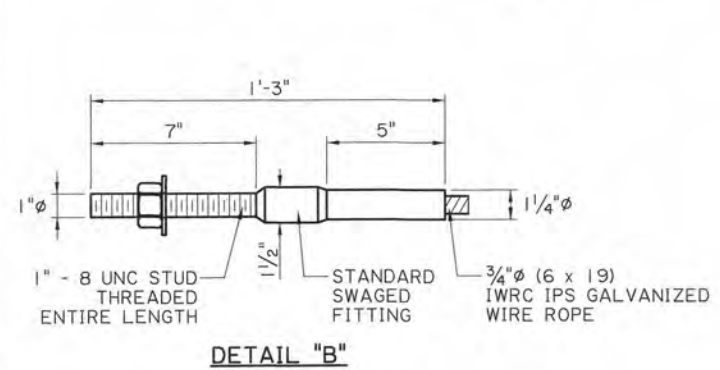
HIGHWAY GUARD RAIL (MASH)
TRAILING END DETAILS
BD.1.1.0.07
GR-MASH-ON
STANDARD
PLAN

DOTD
LOUISIANA DEPARTMENT OF
TRANSPORTATION & DEVELOPMENT
BRIDGE AND
STRUCTURAL
DESIGN

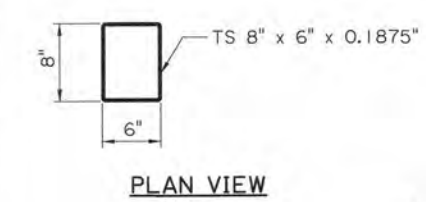
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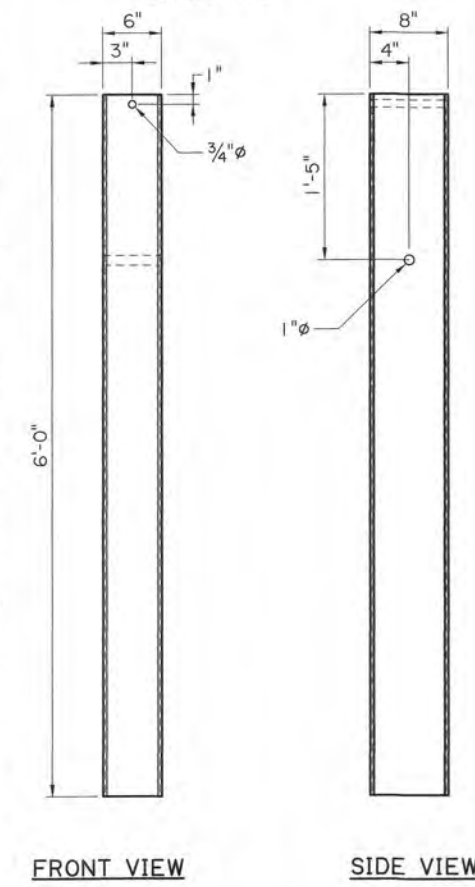
BCT ANCHOR CABLE
N.T.S.



DETAIL "B"



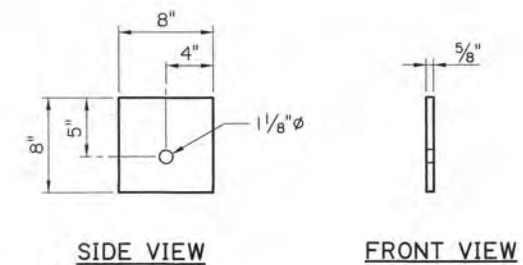
PLAN VIEW



FRONT VIEW

SIDE VIEW

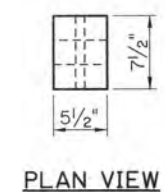
FOUNDATION TUBE
N.T.S.



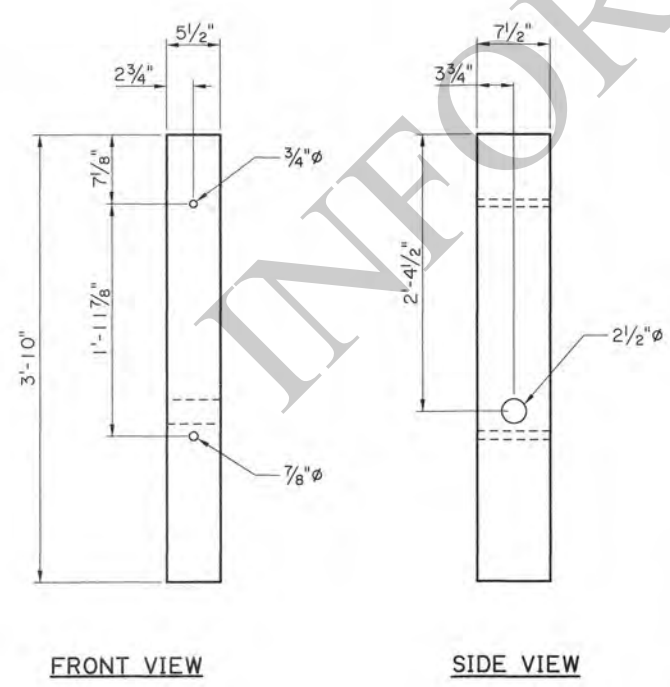
SIDE VIEW

FRONT VIEW

ANCHOR CABLE BEARING PLATE
N.T.S.



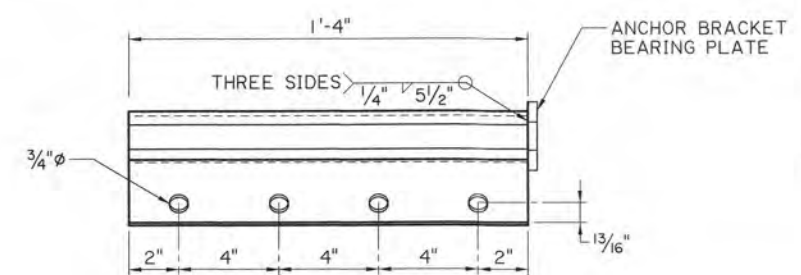
PLAN VIEW



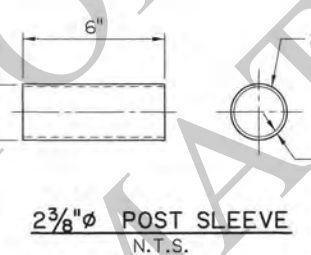
FRONT VIEW

SIDE VIEW

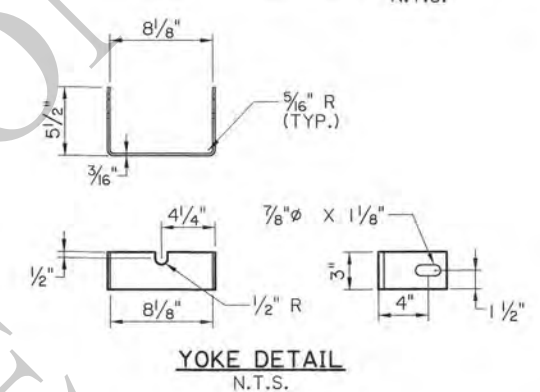
BREAKAWAY WOOD POST
N.T.S.



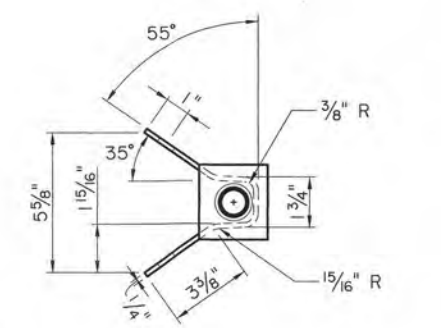
STEEL ANCHOR BRACKET
N.T.S.



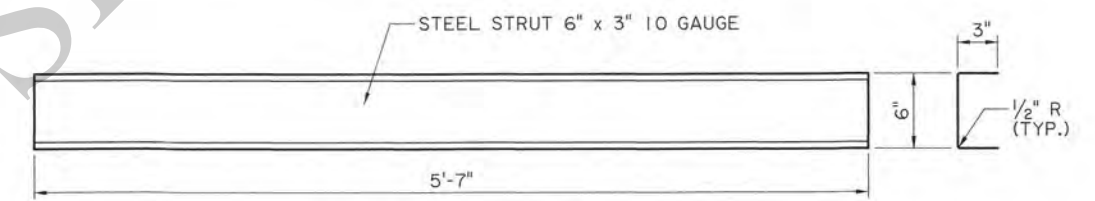
2 3/8" POST SLEEVE
N.T.S.



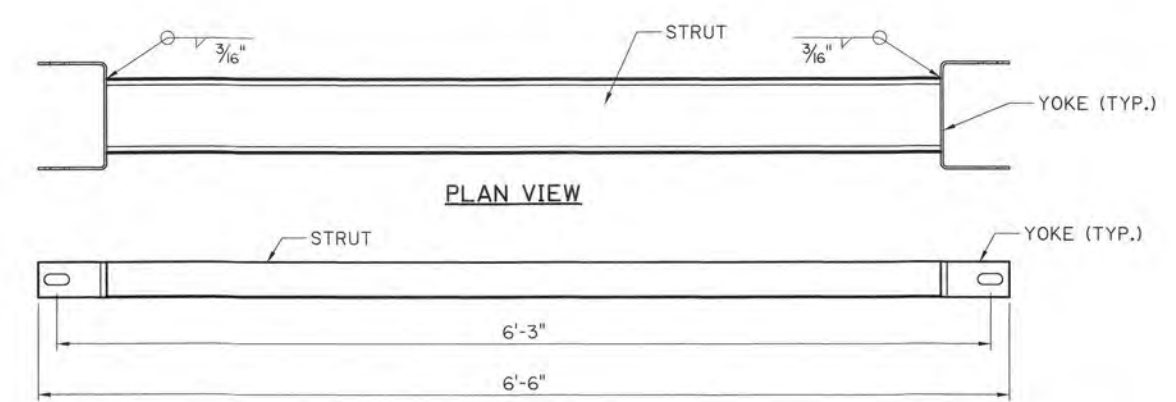
YOKE DETAIL
N.T.S.



ANCHOR BRACKET BEARING PLATE
N.T.S.



STRUT - PLAN VIEW
N.T.S.



PLAN VIEW

FRONT VIEW
GROUND STRUT DETAIL
N.T.S.

NOTES:

FOUNDATION TUBE BOLTS ARE 7/8" DIAMETER ASTM A307 HEX HEAD BOLT. FOUNDATION TUBE BOLTS REQUIRE ASTM A563 A NUT AND TWO ASTM F844 7/8" DIAMETER FLAT WASHERS. INSTALL ONE WASHER UNDER BOLT HEAD AND ONE WASHER UNDER NUT.

ANCHOR BRACKET AND GROUND STRUT BOLTS ARE 5/8" DIAMETER ASTM A307 HEX HEAD BOLTS AND REQUIRE ASTM A563 A NUTS AND TWO ASTM F844 5/8" DIAMETER FLAT WASHERS EACH. INSTALL ONE WASHER UNDER BOLT HEAD AND ONE WASHER UNDER NUT.

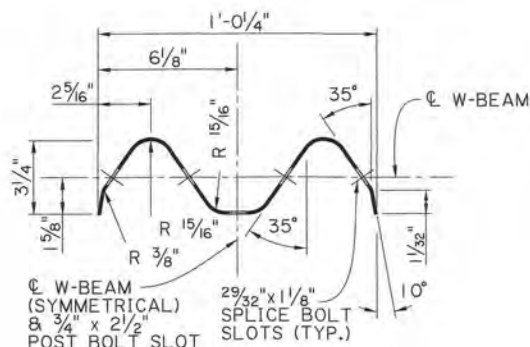
SHEET NUMBER		PARISH		CONTROL SECTION		STATE PROJECT	
P. FOSSIER		K. BRAUNER		J. DOUCET		C. GUIDRY	
DESIGN		CHECK		DETAIL		REVIEW	
SERIES # 8 OF 11							

STATE OF LOUISIANA
KURT M. BRAUNER
License No. 30667
PROFESSIONAL ENGINEER
IN
CIVIL ENGINEERING
3/2/23

APPROVED BY CHIEF ENGINEER
DATE: 4/13/2023

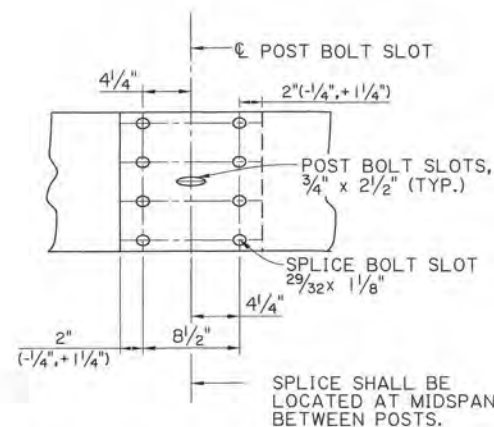
STATE OF LOUISIANA
BRIDGE AND STRUCTURAL DESIGN

HIGHWAY GUARD RAIL (MASH)
TRAILING END DETAILS
STANDARD PLAN
GR-MASH-ON
BD.1.1.0.08



TYPICAL W BEAM

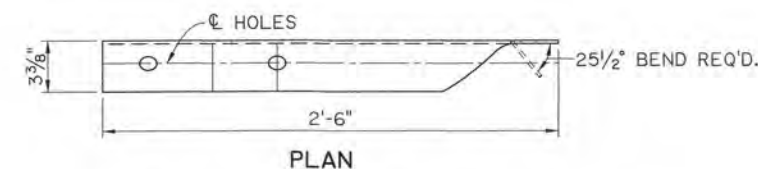
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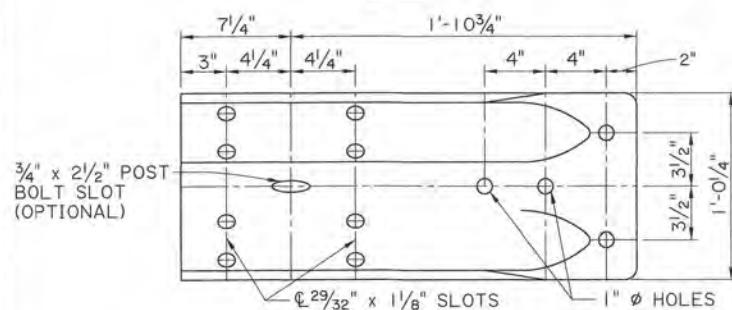
TYPICAL W-BEAM SPLICE DETAIL - ELEVATION

$\frac{5}{8}$ " ϕ x $1\frac{1}{4}$ " BUTTON HEAD OVAL SHOULDER BOLTS WITH $\frac{5}{8}$ " ϕ RECESSED HEX NUTS-TOTAL 8 PER SPLICE. LAP IN DIRECTION OF TRAFFIC.

N.T.S.



PLAN



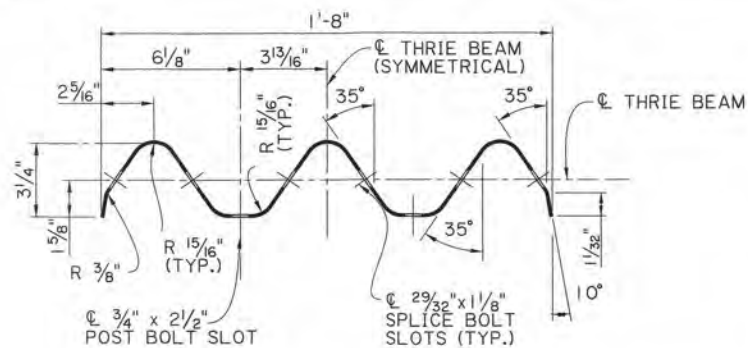
ELEVATION

TYPICAL W BEAM TERMINAL CONNECTOR, 10 GAUGE

N.T.S.

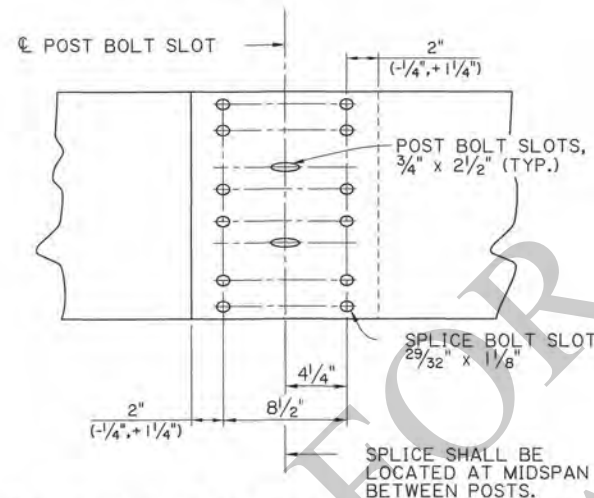
NOTES:

1. ALL RAIL COMPONENTS EXCEPT THE W AND THRIE BEAM TERMINAL CONNECTORS AND THE W TO THRIE BEAM TRANSITION SHALL MEET AASHTO M 180, CLASS "A" (12 GAUGE) METAL THICKNESS WITH A TYPE II COATING. THE W BEAM AND THRIE BEAM TERMINAL CONNECTORS AND TRANSITION SECTIONS SHALL BE CLASS "B" (10 GAUGE) METAL THICKNESS WITH TYPE II COATING.



TYPICAL THRIE BEAM

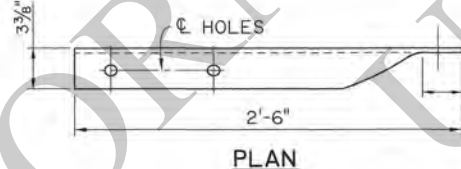
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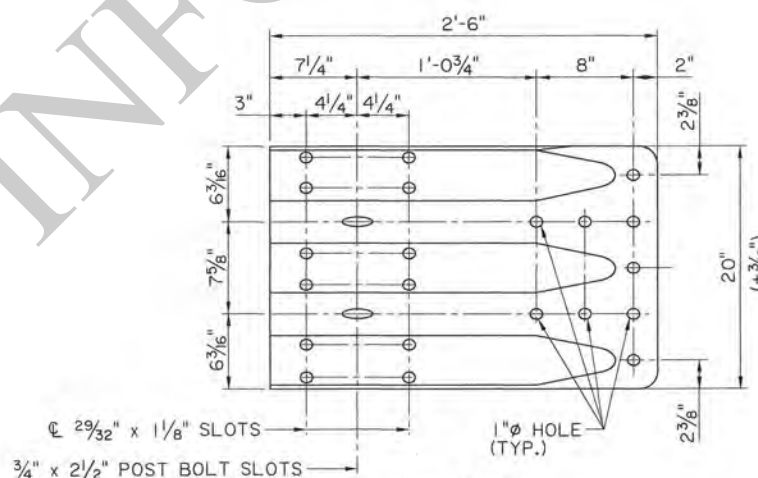
TYPICAL THRIE BEAM SPLICE DETAIL - ELEVATION

$\frac{5}{8}$ " ϕ x $1\frac{1}{4}$ " BUTTON HEAD OVAL SHOULDER BOLTS WITH $\frac{5}{8}$ " ϕ RECESSED HEX NUTS-TOTAL 12 PER SPLICE. LAP IN DIRECTION OF TRAFFIC.

N.T.S.



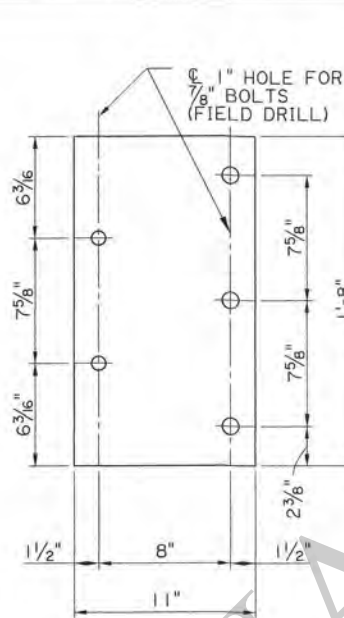
PLAN



ELEVATION

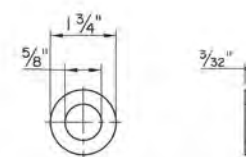
TYPICAL THRIE BEAM TERMINAL CONNECTOR, 10 GAUGE

N.T.S.

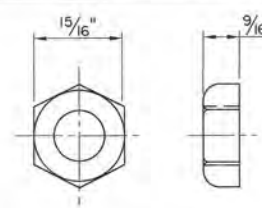
 $\frac{5}{8}$ " ϕ BEARING PLATE

(FOR ANCHORING THRIE BEAM TO CONCRETE BARRIER RAIL)

N.T.S.

 $\frac{5}{8}$ " ϕ POST BOLT WASHERS

N.T.S.



NUT

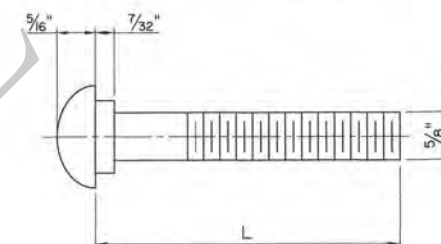


BOLT

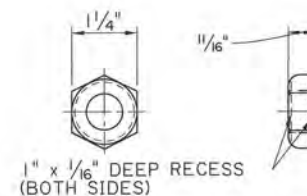
 $\frac{5}{8}$ " ϕ HEX BOLT & HEX NUT

(FOR FASTENING THE ANCHOR BRACKET TO RAIL IN TRAILING END)

N.T.S.

 $\frac{5}{8}$ " ϕ BUTTON HEAD BOLT

N.T.S.

 $\frac{5}{8}$ " ϕ RECESS NUT

N.T.S.

 $\frac{5}{8}$ " ϕ BUTTON HEAD NUT

L	THREAD LENGTH
1 1/4"	1 1/8"
2"	1 3/4"
10"	4"
1'-6"	4"
1'-8"	4"

NOTES:

 $\frac{5}{8}$ " ϕ BUTTON HEAD BOLTS:

(1 1/4" LENGTH): THIS BOLT IS USED TO SPLICE RAIL ELEMENTS USED IN THE STANDARD CORRUGATED SHEET STEEL BEAM GUARD RAIL.

(2" LENGTH): THIS BOLT IS FOR FASTENING RAILS TO STEEL POSTS WHEN USED IN THE STANDARD CORRUGATED SHEET STEEL BEAM GUARD RAIL.

(10" LENGTH): THIS BOLT IS USED FOR FASTENING RAILS TO WOOD BLOCK AND STEEL POST IN THE STANDARD CORRUGATED SHEET STEEL BEAM GUARD RAIL.

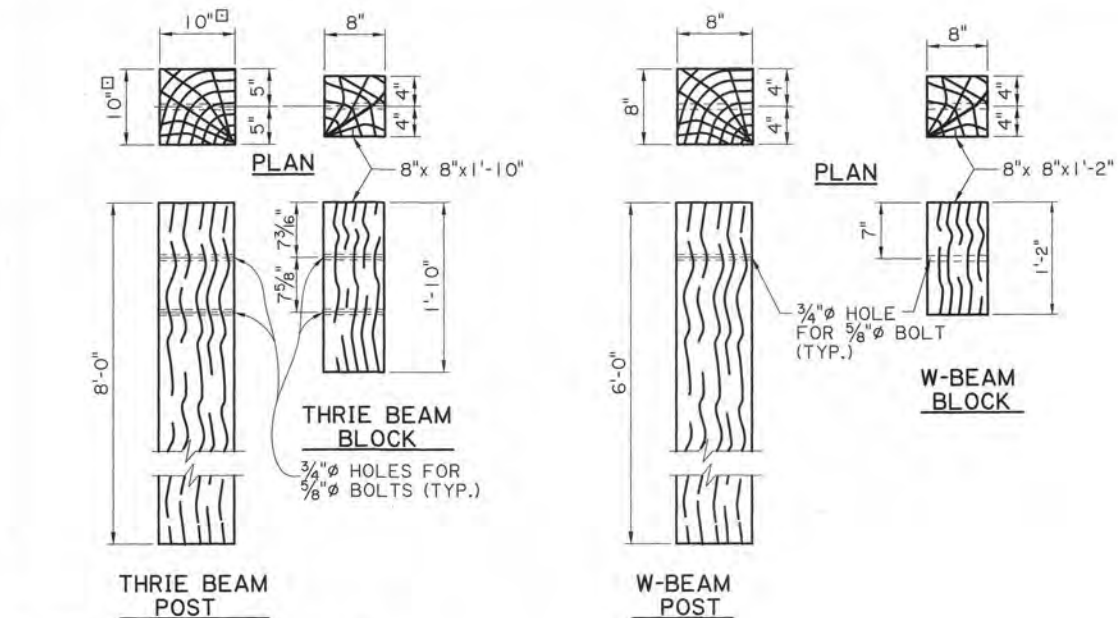
(1'-6" LENGTH): THIS BOLT IS FOR FASTENING WOOD BLOCKS & WOOD POSTS IN THE STANDARD CORRUGATED SHEET STEEL BEAM GUARD RAIL.

(1'-8" LENGTH): THIS BOLT IS FOR FASTENING NESTED THRIE BEAM TO WOOD BLOCKS AND POST AT THE FIRST TWO POST LOCATIONS IN THE GUARD RAIL TRANSITION AT THE ENDS OF RIGID (CONCRETE) STRUCTURES, UNLESS OTHERWISE SHOWN IN THE PLANS.

$\frac{5}{8}$ " ϕ BOLTS SHALL CONFORM TO THE REQUIREMENTS OF ASTM A 307 GRADE "A" AND NUTS SHALL BE IN ACCORDANCE WITH ASTM A 563 GRADE "A" OR BETTER. BOLTS AND NUTS SHALL BE GALVANIZED IN ACCORDANCE WITH ASTM A 153.

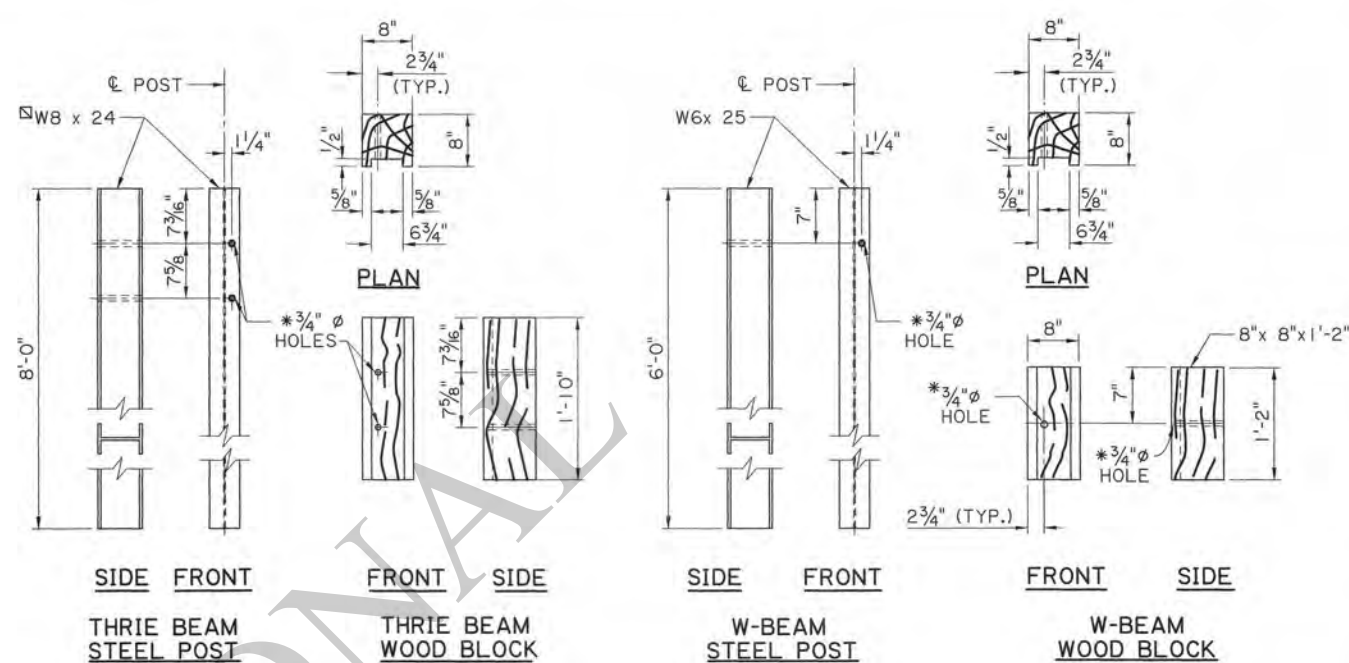
STEEL POST & PLATES:

ALL STEEL POSTS AND PLATES SHALL CONFORM TO ASTM A 36 AND SHALL BE GALVANIZED IN ACCORDANCE WITH ASTM 123, NO PUNCHING, DRILLING OR CUTTING WILL BE PERFORMED AFTER GALVANIZING.



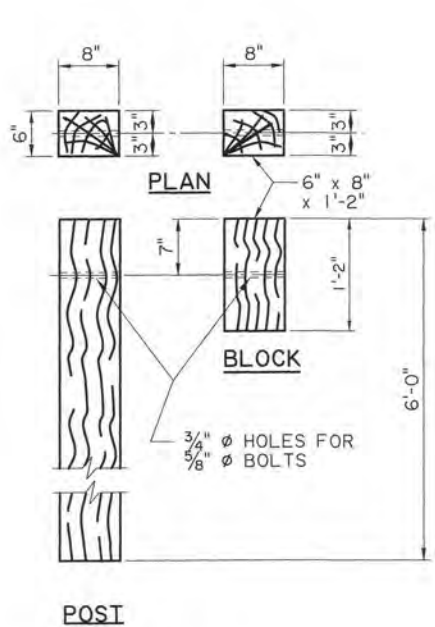
THRIE BEAM POST IS 8"x 8"x 8'-0" FOR TRANSITION POST No. 3.

WOOD POST AND WOOD BLOCK FOR THRIE BEAM TRANSITION TO BRIDGE RAIL
(POST SIZE, BLOCK SIZE AND HOLE LOCATIONS VARY WITH LOCATION IN TRANSITION, SEE SHT.3)
N.T.S.

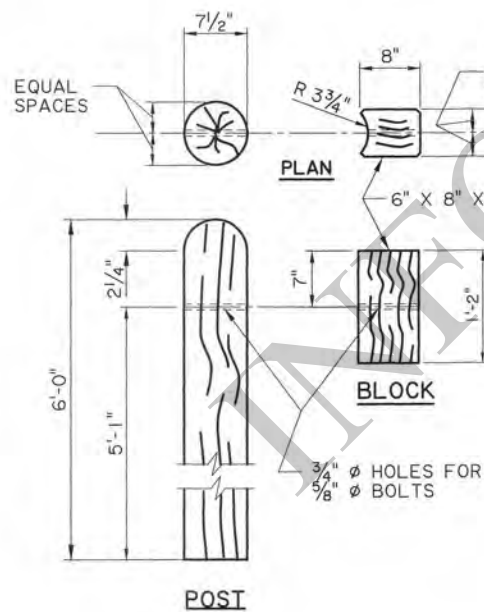


THRIE BEAM POST IS W6 x 25 (8'-0") FOR TRANSITION POST No. 3.

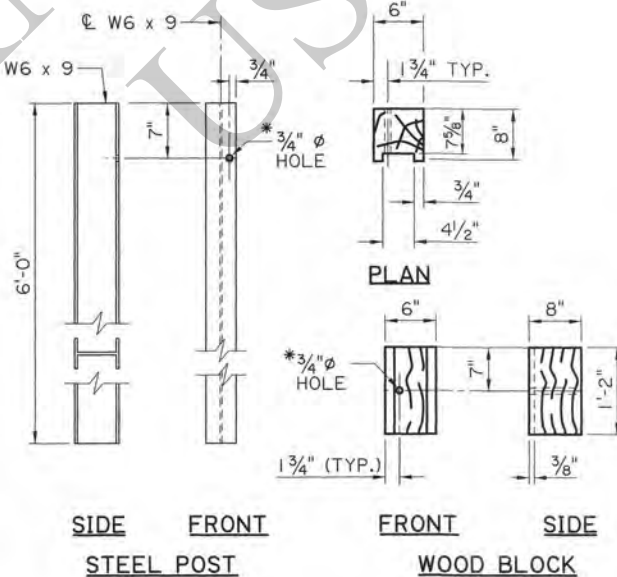
STEEL POST AND ROUTED WOOD BLOCK FOR THRIE BEAM TRANSITION TO BRIDGE RAIL
(POST SIZE, BLOCK SIZE AND HOLE LOCATIONS VARY WITH LOCATION IN TRANSITION, SEE SHT.3)
N.T.S.



WOOD POST AND WOOD BLOCK FOR STANDARD W-BEAM GUARD RAIL
N.T.S.



ROUND WOOD POST AND WOOD BLOCK FOR STANDARD W-BEAM GUARD RAIL
N.T.S.



STEEL POST AND ROUTED WOOD BLOCK FOR STANDARD W-BEAM GUARD RAIL
N.T.S.

NOTES:

1. A RECYCLED BLOCK ALTERNATE IS ALLOWED AS A SUBSTITUTE FOR THE WOOD BLOCK ON A 1 FOR 1 BASIS IN A STANDARD BLOCKED-OUT SECTION AT NO ADDITIONAL PAYMENT. RECYCLED BLOCKS SHALL NOT BE USED IN TRANSITIONS, END TREATMENTS, OR IN TRAILING END SECTIONS. THE RECYCLED BLOCK SHALL HAVE FHWA HARDWARE ELIGIBILITY AND SHALL MEET AASHTO MASH REQUIREMENTS.
2. A W6 x 8.5 STEEL POST MAY BE USED AS AN ALTERNATE FOR A W6 x 9 POST.
3. POST AND BLOCK HOLES SHALL BE DRILLED ADJACENT TO THE DIRECTION OF THE ON-COMING TRAFFIC.
4. ALL WOOD BLOCKS SHALL BE TOE-NAILED TO WOOD POSTS AND BLOCKS (INCLUDING BLOCK COMBINATIONS) WITH A 16d GALVANIZED NAIL TO PREVENT BLOCK ROTATION. (ONE ON EACH SIDE)
5. THE ROUND WOOD POST AND WOOD BLOCKOUT IS ALLOWED TO REPLACE THE 6" X 8" STANDARD LINE POST AND BLOCKOUT FOR W BEAM. THE ROUND WOOD POSTS SHALL NOT BE USED AS AN ALTERNATE FOR CRT POSTS, BCT POSTS, OR THE POSTS IN THE GUARD RAIL TO BRIDGE RAIL TRANSITION SECTION. ROUND POSTS SHALL NOT BE USED IN THE TRAILING END SECTION, BEHIND A CURB, OR IN A GUARD RAIL END TREATMENT UNLESS SPECIFICALLY ALLOWED BY THE MANUFACTURER.

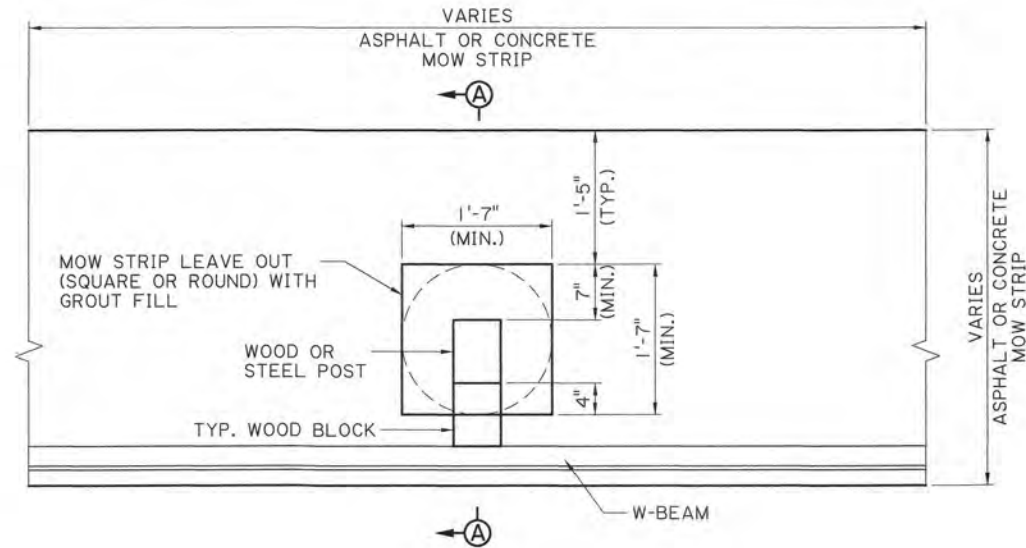
SHEET NUMBER		PARISH		CONTROL SECTION		STATE PROJECT	
DESIGN	K. BRAUNER	CHECK	B. ALLEN	DETAIL	B. ALLEN	CHECK	K. BRAUNER
REVIEW	C. GUIDRY	SERIES # 10 OF 11					

STATE OF LOUISIANA
KURT M. BRAUNER
License No. 30567
PROFESSIONAL ENGINEER
IN
CIVIL ENGINEERING
74m/B
3/2/23

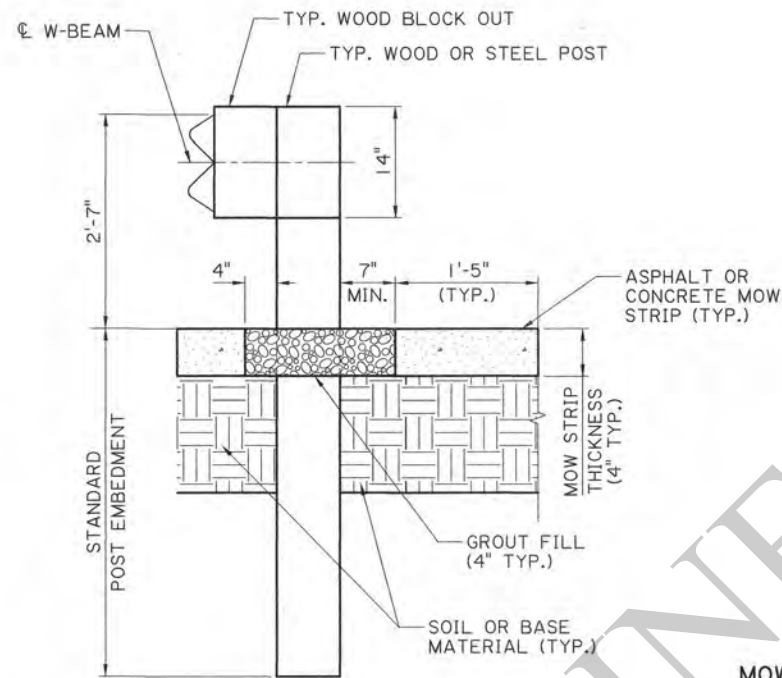
APPROVED BY CHIEF ENGINEER:
[Signature]
DATE: 4/13/2023

STATE OF LOUISIANA
BRIDGE AND STRUCTURAL DESIGN

HIGHWAY GUARD RAIL (MASH)
POST AND BLOCK DETAILS
BD.1.1.0.10
GR-MASH-ON
STANDARD PLAN



PLAN



SECTION A-A

ASPHALT OR CONCRETE MOW STRIPS
N.T.S.

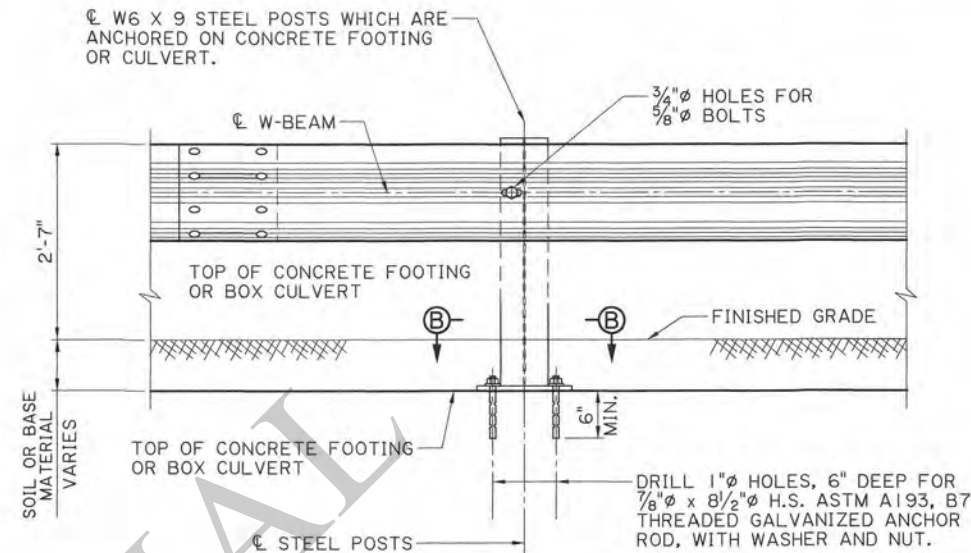
MOW STRIP NOTES:

ALL GUARD RAIL POSTS LOCATED WITHIN CONCRETE OR ASPHALT MOW STRIPS SHALL MEET INSTALLATION REQUIREMENTS SHOWN ON THIS SHEET.

THE LEAVE OUTS SHALL BE FILLED WITH A GROUT MIXTURE CONSISTING OF: 2719 POUNDS SAND, 188 POUNDS TYPE I OR II CEMENT, AND 550 POUNDS OF WATER PER CUBIC YARD WITH A 28 DAY COMPRESSIVE STRENGTH OF 230 PSI OR LESS. PROVIDE GROUT WITH A CONSISTENCY THAT WILL FLOW INTO AND COMPLETELY FILL ALL VOIDS.

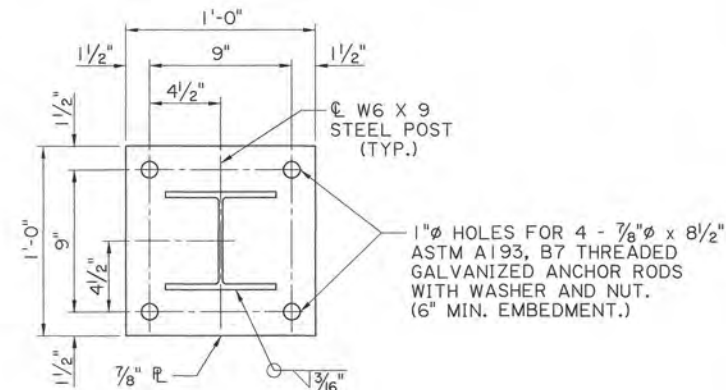
ALL LABOR AND MATERIALS TO PLACE GROUT FILL SHALL BE INCLUDED IN PAYMENT FOR CONCRETE OR ASPHALT PAVING PAY ITEMS.

THE USE OF 6" X 8" RECTANGULAR TIMBER POSTS IN MOW STRIPS HAS ONLY BEEN APPROVED FOR USE UNDER NCHRP REPORT 350. AS PER LADOTD'S MASH IMPLEMENTATION POLICY, THEIR CONTINUED USE IS ALLOWED WHILE A MASH ALTERNATIVE IS DEVELOPED OR EVALUATED.



GALVANIZED STEEL BASE PLATE & STEEL POST

SPECIAL POST WITH BASE PLATE TO BE USED WHEN REQUIRED EMBEDMENT OF CONVENTIONAL POST IN SOIL CANNOT BE OBTAINED, FOR BOX CULVERTS OR OTHER CONCRETE FOOTINGS.



SECTION B-B

ANCHOR ROD INSTALLATION

ALL HOLES DRILLED INTO AN EXISTING CONCRETE STRUCTURE SHALL BE CLEANED WITH COMPRESSED AIR AND MAKE THEM FREE OF ANY OIL OR RESIDUE. THREADED RODS TO BE ANCHORED USING THE HILTI RE500 EPOXY ANCHORING SYSTEM. PLACE ANCHOR BOLT IN HOLE IMMEDIATELY AND WAIT FOR THE MANUFACTURER'S CURE TIME. COST FOR LABOR, MATERIAL AND INSTALLMENT OF BASE PLATE & ANCHOR ROD TO BE PAID FOR AS PART OF GUARD RAIL PAY ITEM.

SHEET NUMBER		PARISH		CONTROL SECTION		STATE PROJECT	
K. BRAUNER		B. ALLEN		K. BRAUNER		C. GUIDRY	
DESIGN		CHECK		DETAIL		REVIEW	
K. BRAUNER		B. ALLEN		K. BRAUNER		C. GUIDRY	
11		OF 11		11		OF 11	

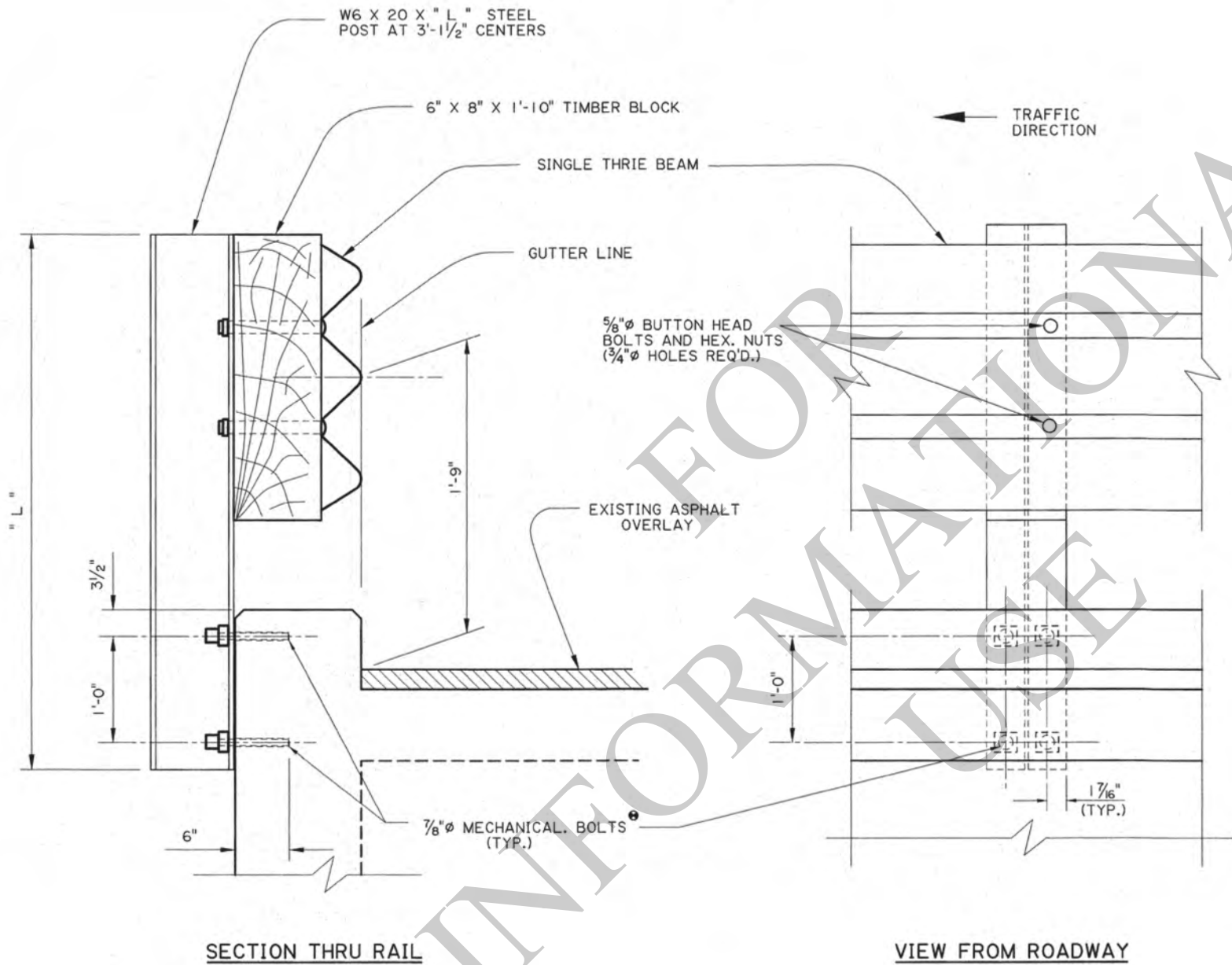
STATE OF LOUISIANA
KURT M. BRAUNER
License No. 3567
PROFESSIONAL ENGINEER
IN
CIVIL ENGINEERING
3/2/23

APPROVED BY CHIEF ENGINEER
4/13/2023

DATE

STATE OF LOUISIANA
BRIDGE AND STRUCTURAL DESIGN

HIGHWAY GUARD RAIL (MASH)
MOW STRIP AND
CONCRETE ANCHOR DETAILS
BD.1.1.0.11
GR-MASH-ON
STANDARD
PLAN



NOTES

FOR ADDITIONAL INFORMATION ON GUARD RAIL, SEE STANDARD PLANS FOR HIGHWAY GUARD RAIL (MASH).

ALL WORK AND MATERIALS REQ'D. TO INSTALL GUARD RAIL ON BOX CULVERTS SHALL BE PAID FOR UNDER ITEM 704-01-01000 GUARD RAIL (SINGLE THRIE BEAM) (3'-1 1/2" POST SPACING).

GUARD RAIL SPLICES SHALL BE MADE AT POST LOCATIONS ONLY. LAP IN DIRECTION OF TRAFFIC.

- USE 7/8" MECHANICAL SYSTEM AS LISTED ON DOTD APPROVED MATERIALS LIST, PRODUCT CATEGORY "CONCRETE ANCHOR SYSTEMS." PLACE BOLT IN HOLES IMMEDIATELY AND WAIT FOR MANUFACTURERS CURE TIME.

ALL STRUCTURAL STEEL SHALL BE ASTM A-36 AND GALVANIZED. ALL 5/8" BOLTS SHALL BE ASTM A307.

THIS DETAIL WAS DEVELOPED AND APPROVED FOR USE UNDER NCHRP REPORT 350. AS PER LADOTD'S MASH IMPLEMENTATION POLICY, ITS CONTINUED USE IS ALLOWED WHILE A MASH ALTERNATIVE IS DEVELOPED OR EVALUATED.

SHEET NUMBER		PARISH		CONTROL SECTION		STATE PROJECT	
P. FOSSIER		C. GAUDRY		J. DOUCET		P. FOSSIER	
DESIGN		CHECK		DETAIL		CHECK	
REVIEW		K. BRAUNER		SERIES		•	

APPROVED BY CHIEF ENGINEER: *Christy P. Hays* DATE: 5/13/2022

STATE OF LOUISIANA
KURT M. BRAUNER
License No. 30567
PROFESSIONAL ENGINEER
IN
CIVIL ENGINEERING
4/22/22

SIDE MOUNT GUARD RAIL
(FOR BOX CULVERTS)

STANDARD PLAN

GRR-01

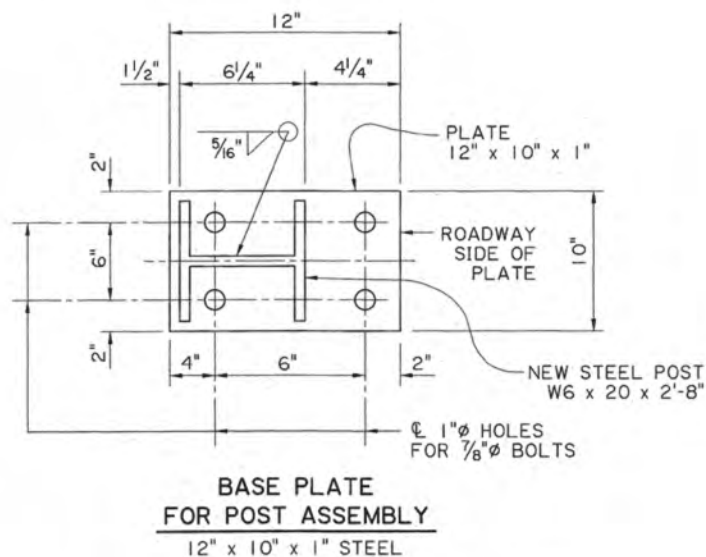
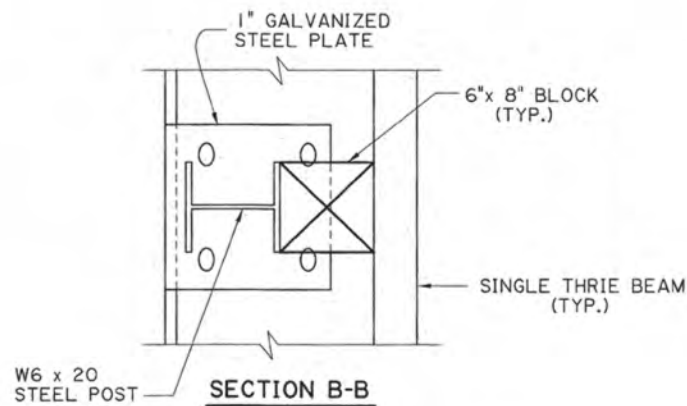
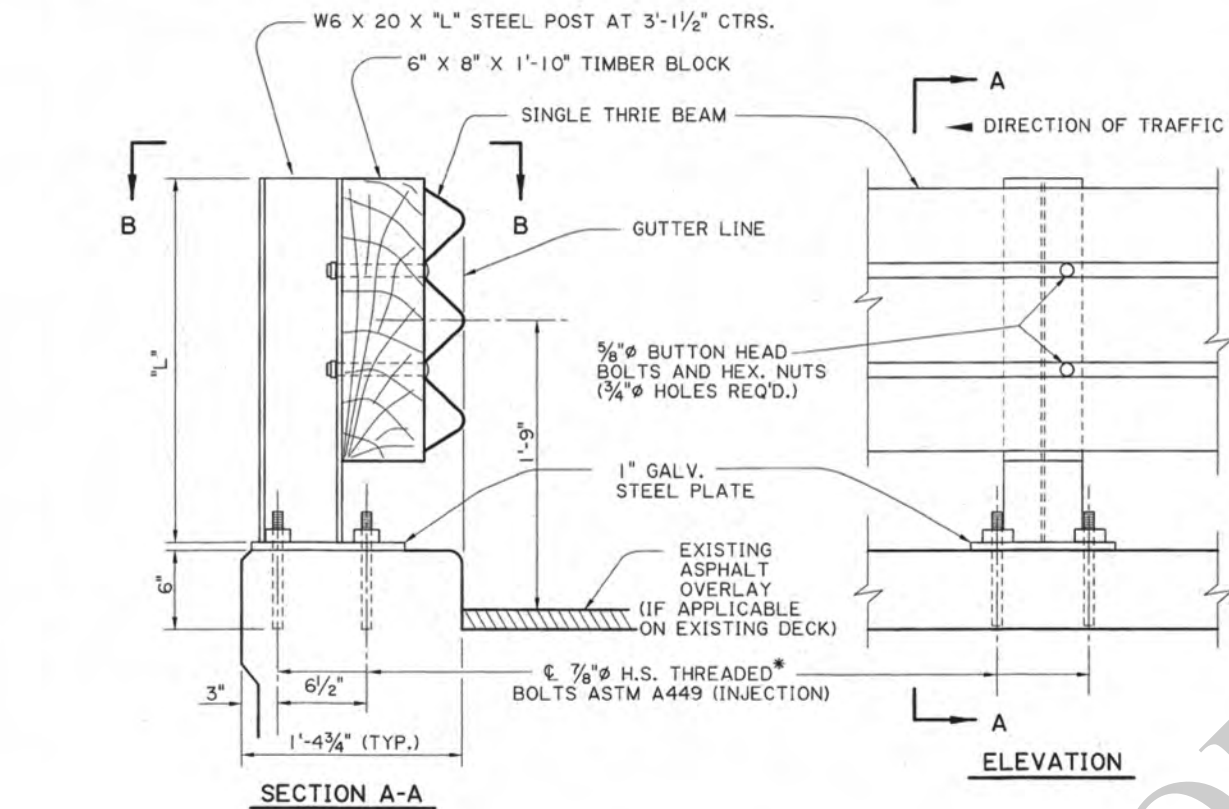
BRIDGE AND STRUCTURAL DESIGN



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5/12/2022

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NOTES

FOR ADDITIONAL INFORMATION ON GUARD RAIL, SEE STANDARD PLANS FOR HIGHWAY GUARD RAIL (MASH).

ALL WORK AND MATERIALS REQ'D. TO INSTALL GUARD RAIL ON BOX CULVERTS SHALL BE PAID FOR UNDER ITEM 704-01-01000 GUARD RAIL (SINGLE THRIE BEAM) (3'-1 1/2" POST SPA.)

GUARD RAIL SPLICES SHALL BE MADE AT POST LOCATIONS ONLY. LAP IN DIRECTION OF TRAFFIC.

*DRILL 1"Ø HOLES, 6" DEEP FOR 7/8"Ø GALVANIZED BOLT. USE 7/8" GALVANIZED NUT WITH GALVANIZED CUT WASHER.

ALL HOLES DRILLED INTO AN EXISTING CONCRETE STRUCTURE SHALL BE CLEANED WITH COMPRESSED AIR AND MADE FREE OF ANY OIL OR RESIDUE. HOLES SHALL BE FILLED WITH 7/8"Ø INJECTION SYSTEM AS LISTED ON APPROVED MATERIALS LIST, PRODUCT CATEGORY "CONCRETE ANCHOR SYSTEMS." PLACE BOLT IN HOLE IMMEDIATELY AND WAIT FOR MANUFACTURERS CURE TIME.

ALL STRUCTURAL STEEL SHALL BE ASTM A-36 AND GALVANIZED. ALL 5/8"Ø BOLTS SHALL BE ASTM A307.

THIS DETAIL WAS DEVELOPED AND APPROVED FOR USE UNDER NCHRP REPORT 350. AS PER LADOTD'S MASH IMPLEMENTATION POLICY, ITS CONTINUED USE IS ALLOWED WHILE A MASH ALTERNATIVE IS DEVELOPED OR EVALUATED.

SHEET NUMBER		PARISH		CONTROL SECTION		STATE PROJECT	
DESIGN	CHECK	DETAIL	CHECK	REVIEW	SERIES		
P. FOSSIER	C. GAUDRY	J. DOUCET	P. FOSSIER	K. BRAUNER			

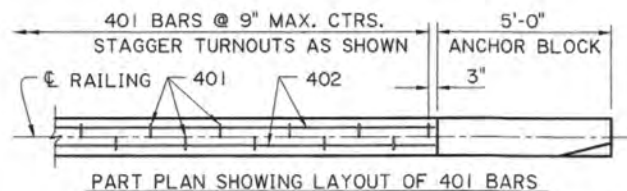
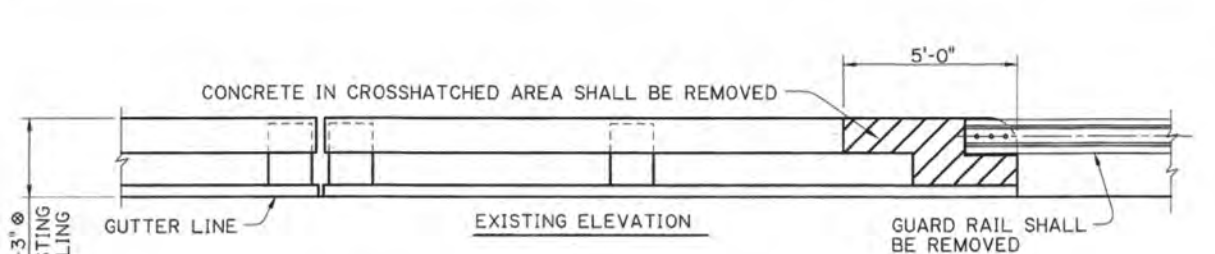
APPROVED BY CHIEF ENGINEER: *Christopher P. Fossier* DATE: 5/13/2022

TOP MOUNTED GUARD RAIL
(FOR BOX CULVERTS)

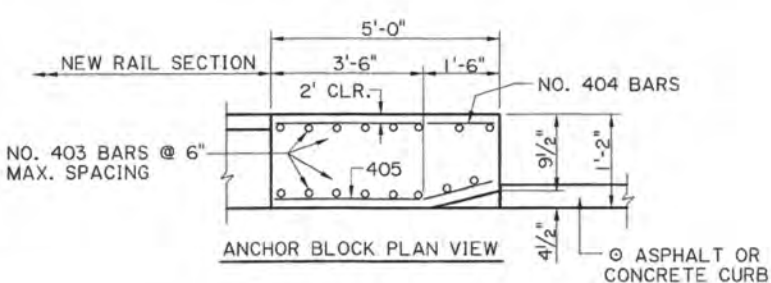
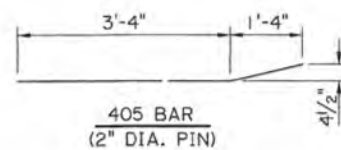
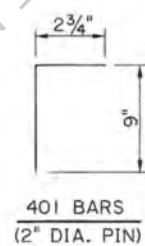
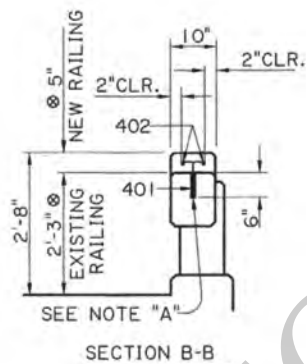
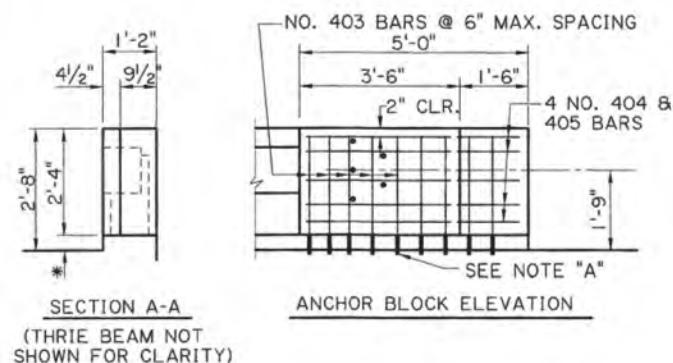
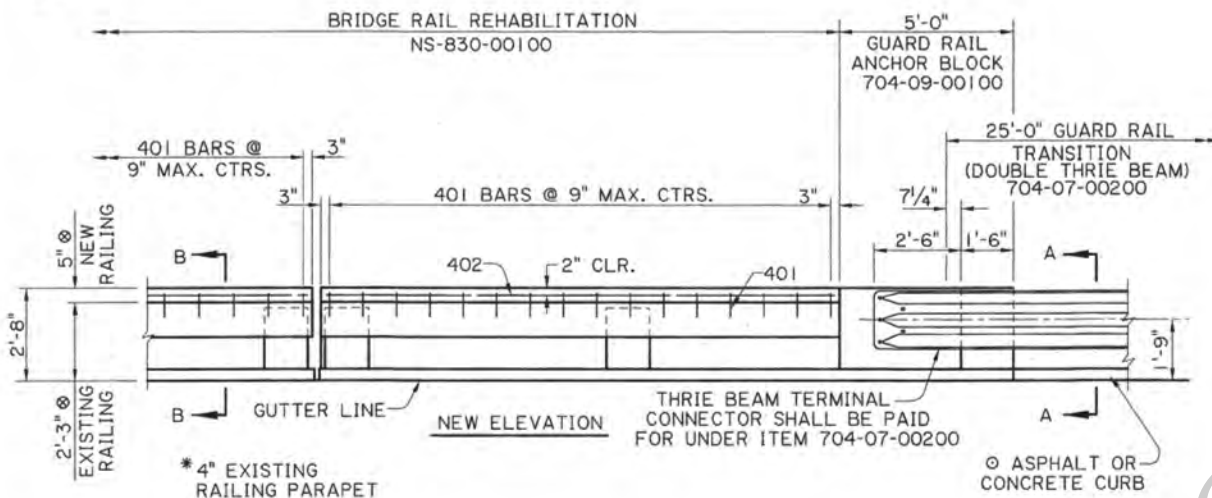
BRIDGE AND STRUCTURAL DESIGN

STANDARD PLAN

GRR-02



NOTE: HOLES FOR 401 BARS SHALL BE DRILLED ON ϕ RAIL



GENERAL NOTES

FOR ADDITIONAL INFORMATION ON GUARD RAIL, SEE STANDARD PLANS FOR HIGHWAY GUARD RAIL (MASH).
ALL DIMENSIONS SHALL BE VERIFIED IN THE FIELD BY THE CONTRACTOR AND APPROVED BY THE PROJECT ENGINEER.
FOR CURB & TRANSITION INFORMATION, SEE STANDARD PLANS FOR HIGHWAY GUARD RAIL (MASH), SHEET 3 OF 11.
2'-3" & 5" DIMENSIONS MAY VARY.

BARRIER RAIL REHABILITATION

ALL WORK AND MATERIALS REQUIRED TO RAISE THE EXISTING BARRIER RAIL TO THE REQUIRED HEIGHT OF 2'-8" SHALL BE PAID FOR UNDER: BARRIER RAIL REHABILITATION, PER LIN. FT.

GUARD RAIL ANCHOR BLOCKS

ALL WORK AND MATERIALS REQUIRED TO REMOVE EXISTING RAILING AND CONSTRUCT THE ANCHOR BLOCK SHALL BE PAID FOR UNDER: GUARD RAIL ANCHOR BLOCK, PER EACH, ITEM 704-09-00100

CONCRETE IN CROSS HATCHED AREA SHALL BE REMOVED. THE EXISTING REINFORCING STEEL SHALL REMAIN IN PLACE AND SHALL BE CLEANED AND STRAIGHTENED TO THE SATISFACTION OF THE PROJECT ENGINEER BEFORE POURING NEW CONCRETE.

CONCRETE

NEW CONCRETE SHALL BE CLASS "A1".

NOTE "A"

NO. 401 & 403 BARS SET IN $\frac{3}{4}$ " DRILLED HOLES. CLEAN HOLES WITH COMPRESSED AIR AND MAKE THEM FREE OF ANY OIL OR RESIDUE. FILL HOLES WITH A TYPE IV, GRADE 2 OR 3 EPOXY LISTED ON THE APPROVED MATERIALS LIST, PRODUCT CATEGORY "EPOXY RESIN SYSTEMS". PLACE BARS IN HOLES AND WAIT THE MANUFACTURER'S CURE TIME BEFORE POURING NEW CONCRETE.

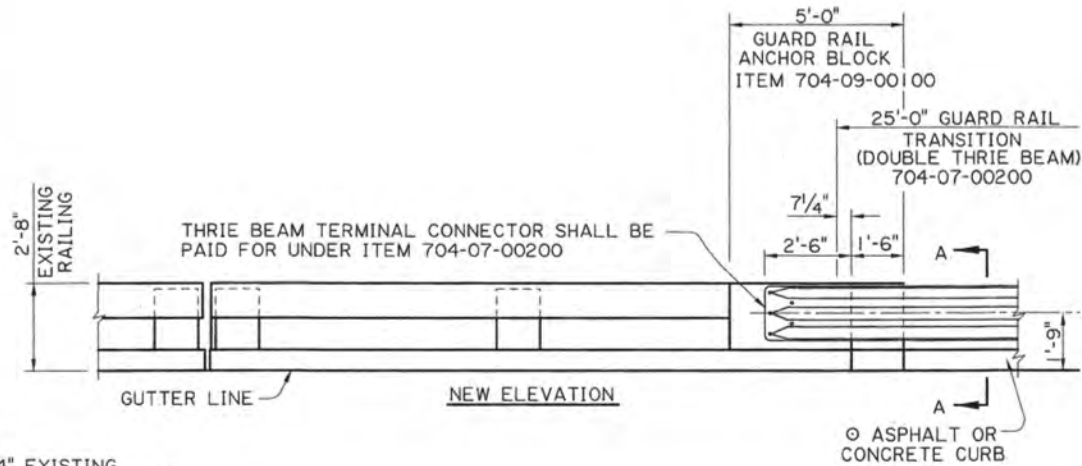
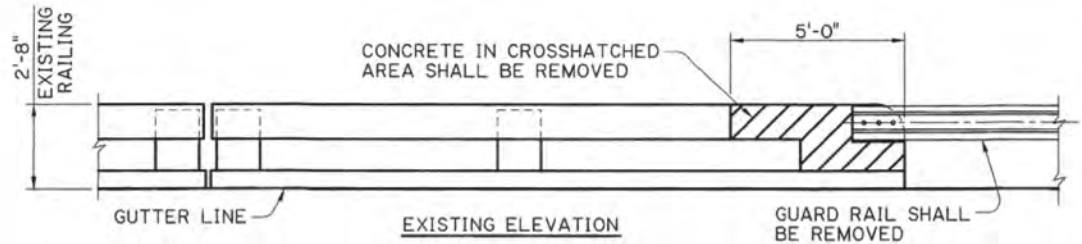
THIS DETAIL WAS DEVELOPED AND APPROVED FOR USE UNDER NCHRP REPORT 350. AS PER LADOTD'S MASH IMPLEMENTATION POLICY, ITS CONTINUED USE IS ALLOWED WHILE A MASH ALTERNATIVE IS DEVELOPED OR EVALUATED.

SHEET NUMBER		PARISH		CONTROL SECTION		STATE PROJECT	
P. FOSSIER		C. GAUDRY		J. DOUCET		P. FOSSIER	
DESIGN		CHECK		DETAIL		REVIEW	
KURT M. BRAUNER		KURT M. BRAUNER		KURT M. BRAUNER		KURT M. BRAUNER	
LICENSED PROFESSIONAL ENGINEER		LICENSED PROFESSIONAL ENGINEER		LICENSED PROFESSIONAL ENGINEER		LICENSED PROFESSIONAL ENGINEER	
IN		IN		IN		IN	
CIVIL ENGINEERING		CIVIL ENGINEERING		CIVIL ENGINEERING		CIVIL ENGINEERING	
APPROVED BY CHIEF ENGINEER		APPROVED BY CHIEF ENGINEER		APPROVED BY CHIEF ENGINEER		APPROVED BY CHIEF ENGINEER	
DATE: 5/3/2022		DATE: 5/3/2022		DATE: 5/3/2022		DATE: 5/3/2022	
ANCHOR BLOCK & BRIDGE RAIL REHABILITATION FOR LOW CONCRETE POST AND RAIL		ANCHOR BLOCK & BRIDGE RAIL REHABILITATION FOR LOW CONCRETE POST AND RAIL		ANCHOR BLOCK & BRIDGE RAIL REHABILITATION FOR LOW CONCRETE POST AND RAIL		ANCHOR BLOCK & BRIDGE RAIL REHABILITATION FOR LOW CONCRETE POST AND RAIL	
BRIDGE AND STRUCTURAL DESIGN		BRIDGE AND STRUCTURAL DESIGN		BRIDGE AND STRUCTURAL DESIGN		BRIDGE AND STRUCTURAL DESIGN	

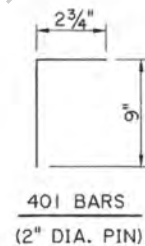
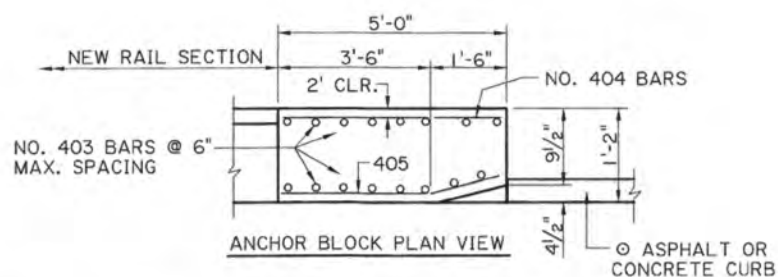
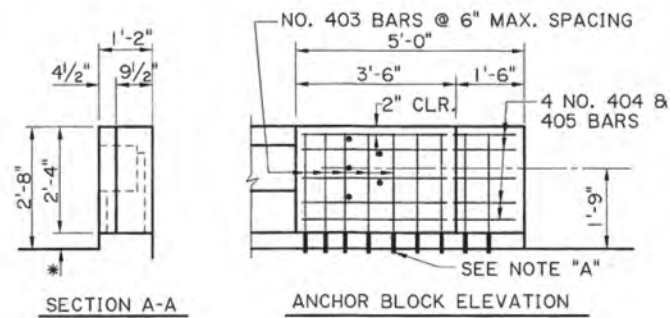


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* 4" EXISTING RAILING PARAPET



GENERAL NOTES

FOR ADDITIONAL INFORMATION ON GUARD RAIL, SEE STANDARD PLANS FOR HIGHWAY GUARD RAIL (MASH).
ALL DIMENSIONS SHALL BE VERIFIED IN THE FIELD BY THE CONTRACTOR AND APPROVED BY THE PROJECT ENGINEER.

Ø FOR CURB & TRANSITION INFORMATION, SEE STANDARD PLANS FOR HIGHWAY GUARD RAIL (MASH), SHEET 3 OF 11.

GUARD RAIL ANCHOR BLOCKS

ALL WORK AND MATERIALS REQUIRED TO REMOVE EXISTING RAILING AND CONSTRUCT THE ANCHOR BLOCK SHALL BE PAID FOR UNDER: GUARD RAIL ANCHOR BLOCK, PER EACH, ITEM 704-09-00100

CONCRETE IN CROSS HATCHED AREA SHALL BE REMOVED. THE EXISTING REINFORCING STEEL SHALL REMAIN IN PLACE AND SHALL BE CLEANED AND STRAIGHTENED TO THE SATISFACTION OF THE PROJECT ENGINEER BEFORE POURING NEW CONCRETE. THE REINFORCING STEEL IN THE 1'-6" X 4 1/2" SLOT MAY BE CUT OR BENT TO ACCOMMODATE THIS SLOT.

NOTE "A"

NO. 401 & 403 BARS SET IN 3/4" Ø DRILLED HOLES. CLEAN HOLES WITH COMPRESSED AIR AND MAKE THEM FREE OF ANY OIL OR RESIDUE. FILL HOLES WITH A TYPE IV, GRADE 2 OR 3 EPOXY LISTED ON THE APPROVED MATERIALS LIST, PRODUCT CATEGORY "EPOXY RESIN SYSTEMS". PLACE BARS IN HOLES AND WAIT THE MANUFACTURER'S CURE TIME BEFORE POURING NEW CONCRETE.

THIS DETAIL WAS DEVELOPED AND APPROVED FOR USE UNDER NCHRP REPORT 350. AS PER LADOTD'S MASH IMPLEMENTATION POLICY, ITS CONTINUED USE IS ALLOWED WHILE A MASH ALTERNATIVE IS DEVELOPED OR EVALUATED.

SHEET NUMBER	
DESIGN	CHECK
DETAIL	CHECK
REVIEW	SERIES
P. FOSSIER	C. GAUDRY
J. DOUCET	P. FOSSIER
K. BRAUNER	

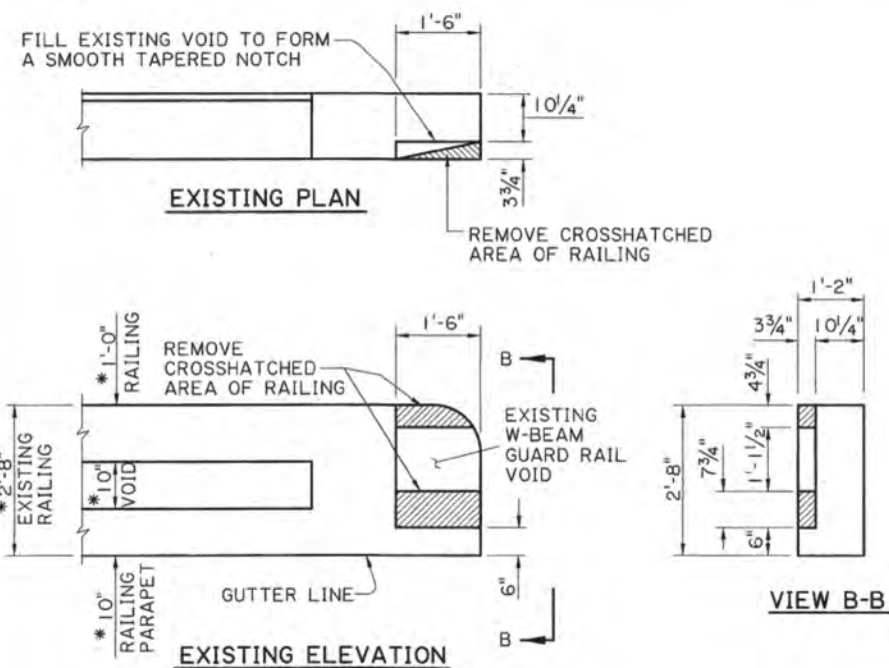
KURT M. BRAUNER
License No. 30567
PROFESSIONAL ENGINEER
IN
CIVIL ENGINEERING
5/3/2022

APPROVED BY CHIEF ENGINEER:

GUARD RAIL ANCHOR BLOCK
REHABILITATION FOR CONCRETE
POST & RAIL (ALTERNATE 1)

BRIDGE AND
STRUCTURAL
DESIGN

DOTD
LOUISIANA DEPARTMENT OF
TRANSPORTATION & DEVELOPMENT



GENERAL NOTES

FOR ADDITIONAL INFORMATION ON GUARD RAILS, SEE STANDARD PLANS FOR HIGHWAY GUARD RAIL (MASH).

* THESE DIMENSIONS MAY VARY. THE NON-SHRINK GROUT QUANTITY AND 403 BAR LENGTH SHALL BE ADJUSTED ACCORDINGLY.

ALL DIMENSIONS SHALL BE VERIFIED IN THE FIELD BY THE CONTRACTOR AND APPROVED BY THE PROJECT ENGINEER.

⊙ FOR CURB & TRANSITION, SEE STANDARD PLANS FOR HIGHWAY GUARD RAIL (MASH), SHEET 3 OF 11.

GUARD RAIL ANCHOR BLOCKS

ALL WORK AND MATERIALS REQUIRED TO MODIFY EXISTING RAILING SHALL BE PAID FOR UNDER: GUARD RAIL ANCHOR BLOCK, PER EACH, ITEM 704-09-00100.

NOTE "A"

DRILL 3/4"Ø HOLES THROUGH THE RAILING AND INTO THE RAILING PARAPET AS SHOWN. CLEAN HOLES WITH COMPRESSED AIR TO REMOVE ALL OIL AND RESIDUE. FILL HOLES WITH A TYPE IV, GRADE 2 OR 3 EPOXY LISTED ON THE APPROVED MATERIALS LIST, PRODUCT CATEGORY "EPOXY RESIN SYSTEMS". PLACE 403 BARS (2'-2" LONG) IN HOLES AND WAIT THE MANUFACTURER'S CURE TIME BEFORE POURING NEW CONCRETE.

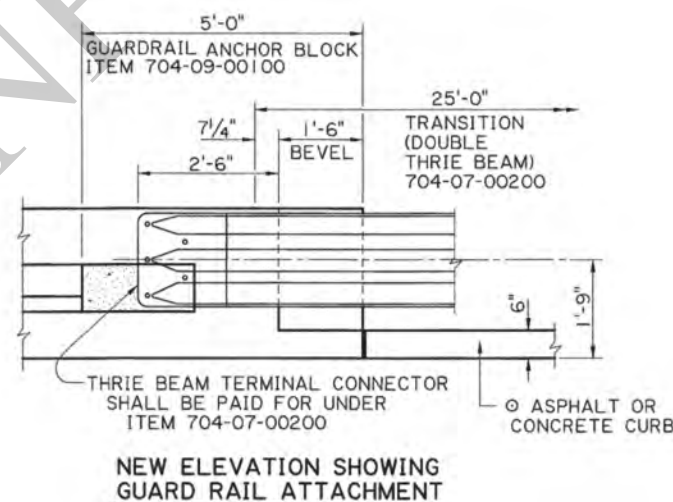
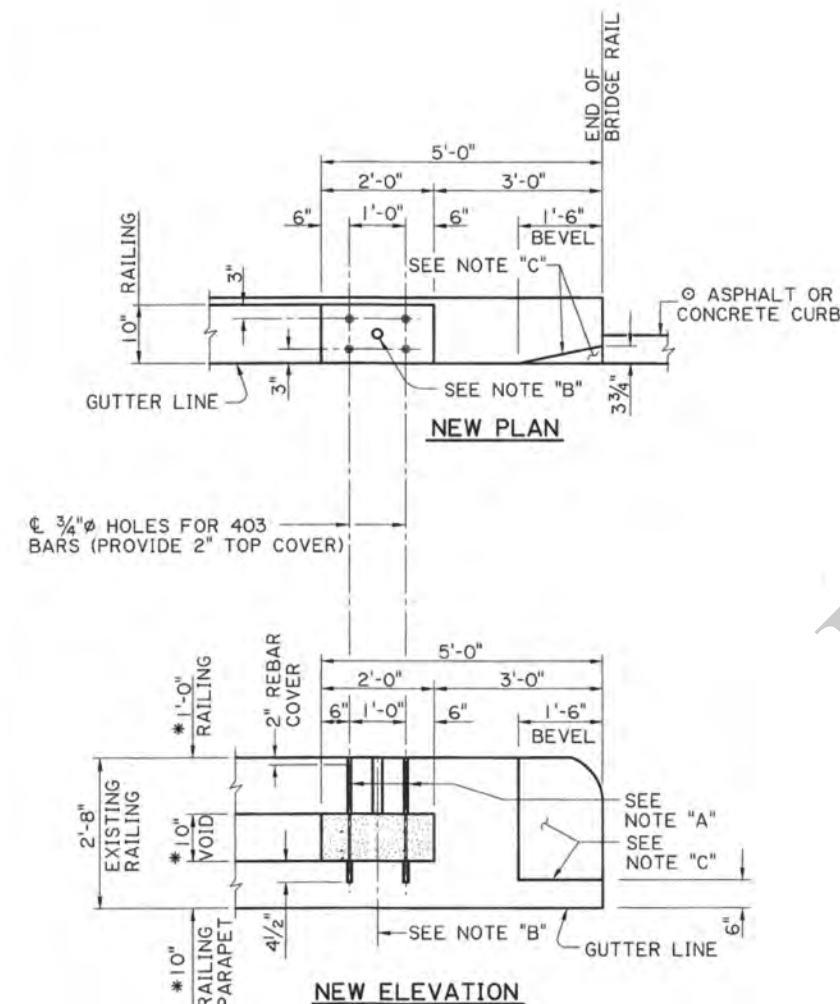
NOTE "B"

DRILL A 2"Ø HOLE THROUGH THE DEPTH OF RAILING. FILL VOID BETWEEN RAILING AND RAILING PARAPET THROUGH THE 2"Ø HOLE WITH AN APPROVED FLOWABLE NON-SHRINK GROUT LISTED ON APPROVED MATERIALS LIST, PRODUCT CATEGORY "NON-SHRINK GROUT."

NOTE "C"

AFTER REMOVING THE EXISTING CONCRETE TO CONSTRUCT THE 1'-6" BEVEL FULL HEIGHT, PREPARE THE VERTICAL SURFACE OF THE EXISTING VOID FOR AN EPOXY RESIN JOINT ACCORDING TO SUBSECTION 805.05.8.2 AND PLACE CONCRETE IN VOID. REDRESS AND FORM THE ENTIRE SURFACE OF THE BEVEL TO GIVE A SMOOTH APPEARANCE BY USING A FLOWABLE NON-SHRINK GROUT LISTED ON APPROVED MATERIALS LIST, PRODUCT CATEGORY "NON-SHRINK GROUT."

THIS DETAIL WAS DEVELOPED AND APPROVED FOR USE UNDER NCHRP REPORT 350. AS PER LADOTD'S MASH IMPLEMENTATION POLICY, ITS CONTINUED USE IS ALLOWED WHILE A MASH ALTERNATIVE IS DEVELOPED OR EVALUATED.



SHEET NUMBER		PARISH		CONTROL SECTION		STATE PROJECT	
P. FOSSIER	C. GAUDRY	J. DOUCET	P. FOSSIER	K. BRAUNER			
DESIGN	CHECK	DETAIL	CHECK	REVIEW	SERIES		

APPROVED BY CHIEF ENGINEER:
Christy P. Hayes
DATE: 5/13/2022

GUARD RAIL ANCHOR BLOCK
REHABILITATION FOR CONCRETE
POST & RAIL (ALTERNATE 2)

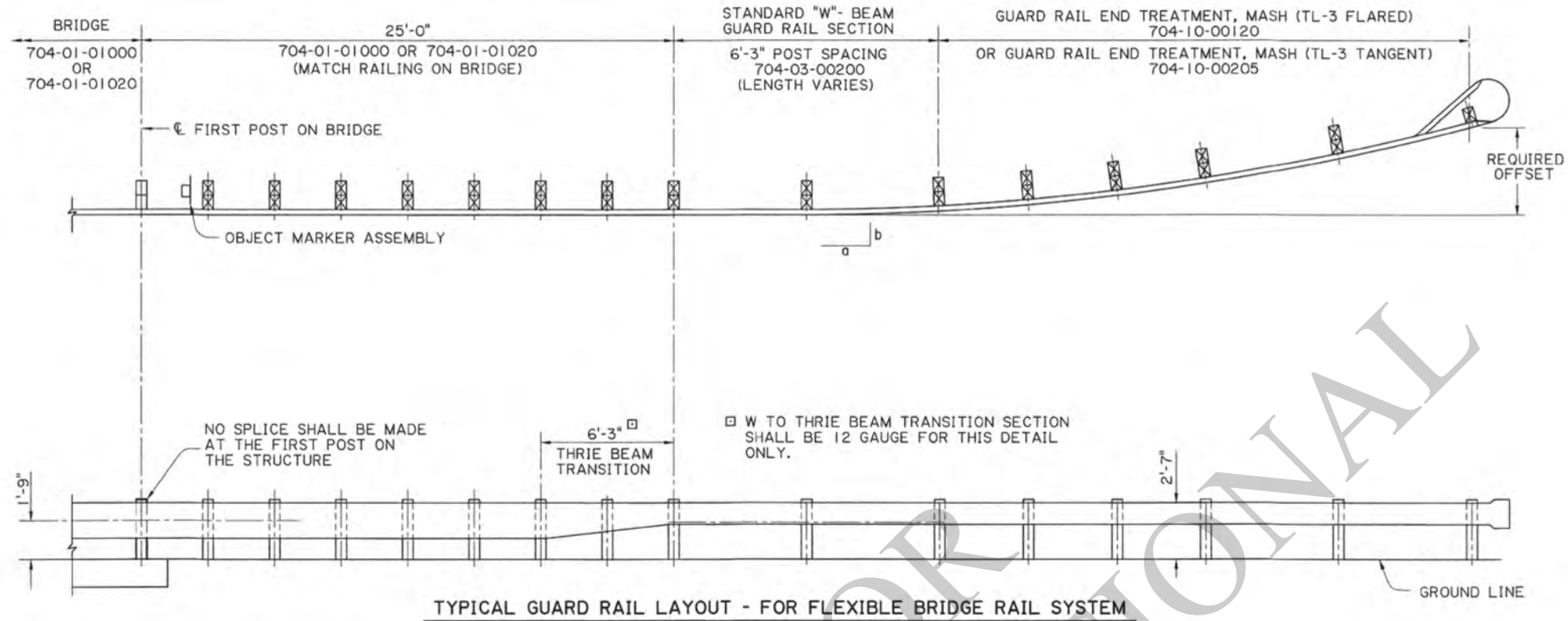
BRIDGE AND
STRUCTURAL
DESIGN



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5/12/2022

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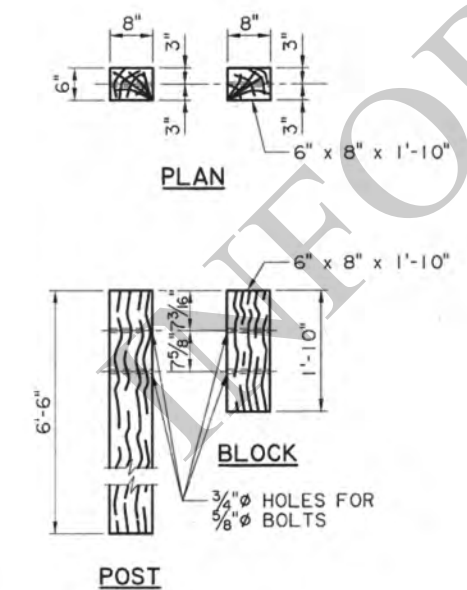


NOTES

LAYOUTS SHOWN ARE FOR BRIDGE STRUCTURES WHICH HAVE FLEXIBLE BRIDGE RAILING.

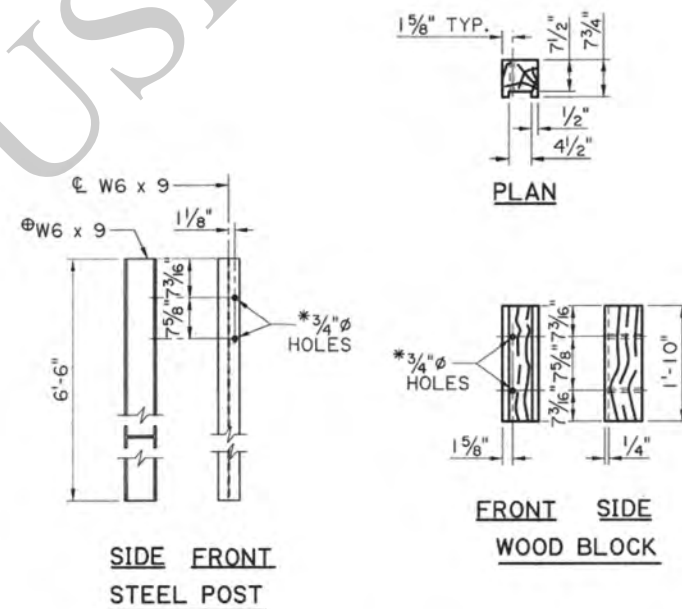
FOR ADDITIONAL INFORMATION ON GUARD RAILS, SEE STANDARD PLANS FOR HIGHWAY GUARD RAIL (MASH).

THIS DETAIL WAS DEVELOPED AND APPROVED FOR USE UNDER NCHRP REPORT 350. AS PER LADOT'S MASH IMPLEMENTATION POLICY, ITS CONTINUED USE IS ALLOWED WHILE A MASH ALTERNATIVE IS DEVELOPED OR EVALUATED.



WOOD POST AND WOOD BLOCK FOR
STANDARD THRIE BEAM GUARD RAIL

N.T.S.



STEEL POST AND ROUTED WOOD BLOCK
FOR STANDARD THRIE BEAM GUARD RAIL

N.T.S.

⊕ A W6 x 8.5 STEEL POST MAY
BE USED AS AN ALTERNATE
FOR A W6 x 9 POST.

* POST AND BLOCK HOLES SHALL
BE DRILLED ADJACENT TO THE
DIRECTION OF THE TRAFFIC.

SHEET NUMBER		PARISH		CONTROL SECTION		STATE PROJECT	
P. FOSSIER	C. GAUDRY	J. DOUCET	P. FOSSIER	K. BRAUNER			
DESIGN	CHECK	DETAIL	CHECK	REVIEW	SERIES		

KURT M. BRAUNER
License No. 30567
PROFESSIONAL ENGINEER
IN
CIVIL ENGINEERING
4/22/22

APPROVED BY CHIEF ENGINEER: *Christy P. Haddad* DATE: 5/3/2022

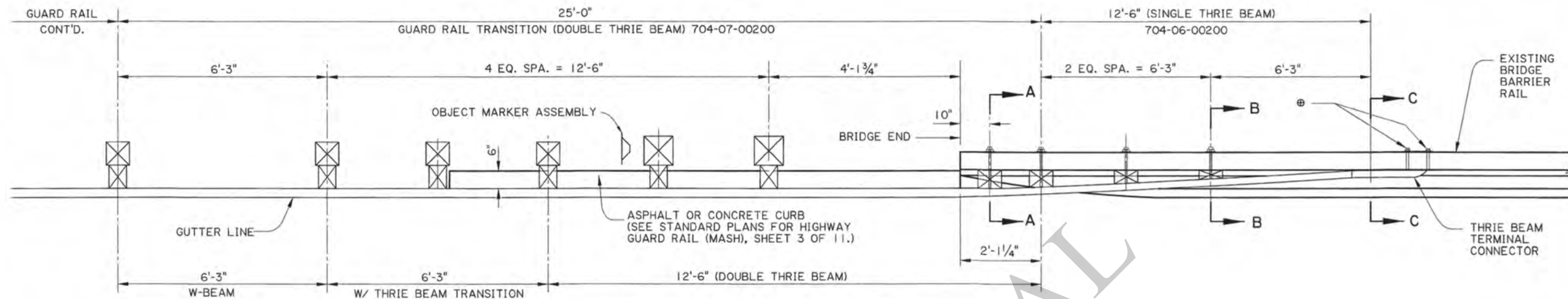
LOUISIANA DEPARTMENT OF
TRANSPORTATION & DEVELOPMENT

BRIDGE AND
STRUCTURAL
DESIGN

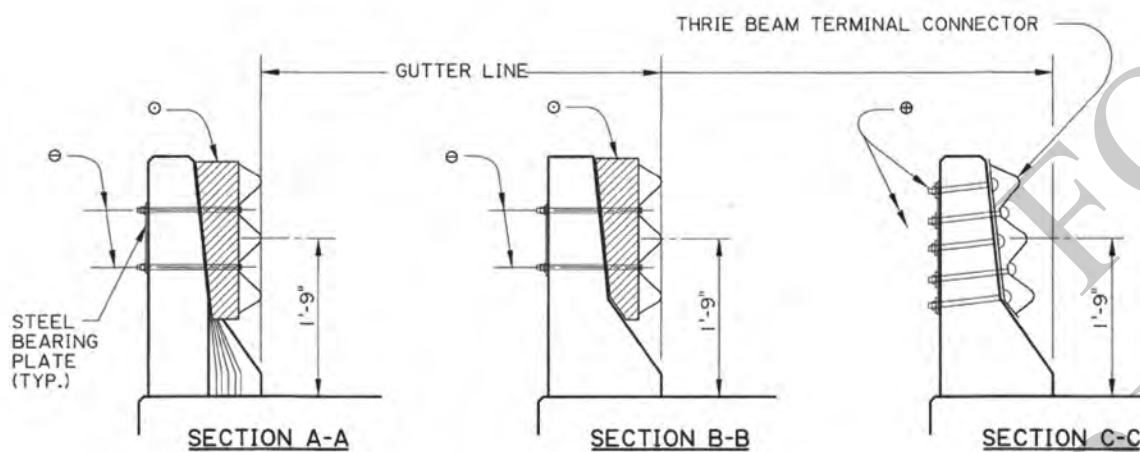
APPROACH GUARD RAIL FOR
STRUCTURES WITH FLEXIBLE RAILS

STANDARD
PLAN

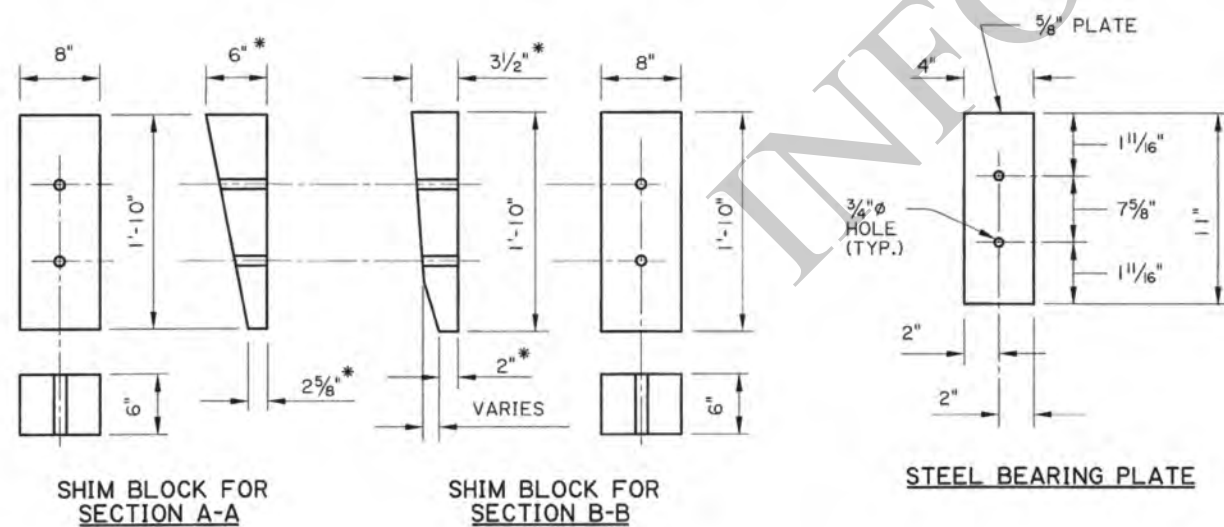
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PLAN VIEW



- ⊕ 5 - 7/8" H.S. ASTM A449 HEX THROUGH BOLTS WITH 5/8" BEARING PLATE (SEE STANDARD PLANS FOR HIGHWAY GUARD RAIL (MASH), SHEET 9 OF 11.)
- ⊕ 2 - 5/8" BUTTON HEAD BOLTS WITH 5/8" BEARING PLATE, NUTS, & WASHERS
- ⊕ 6" x 8" x 1'-10" TREATED TIMBER BLOCK (CUT & SHAPE IN THE FIELD TO FIT).



* DIMENSIONS ARE ASSUMED. ADJUST IN THE FIELD AS REQUIRED.
HOLES SHALL BE DRILLED IN THE FIELD. SEE NOTE NO. 8.

NOTES:

1. FOR ADDITIONAL INFORMATION ON GUARD RAIL TRANSITION, SEE STANDARD PLANS FOR HIGHWAY GUARD RAIL (MASH), SHEET 3 OF 11.
2. ALL HARDWARE AND TIMBER USED FOR CONNECTING THE SINGLE THRIE BEAM TO THE EXISTING BRIDGE RAIL SHALL BE PAID FOR UNDER ITEM 704-06-00200, GUARD RAIL BRIDGE ATTACHMENTS (SINGLE THRIE BEAM), PER LIN. FT.
3. ANY DAMAGE DONE TO THE EXISTING STRUCTURE DURING INSTALLATION OF THE GUARD RAIL SHALL BE REPAIRED AT THE CONTRACTORS EXPENSE AND TO THE SATISFACTION OF THE PROJECT ENGINEER.
4. GALV. STEEL Ogee WASHER MAY BE USED IN LIEU OF THE STEEL BEARING PLATE.
5. ALL H.S. BOLTS SHALL BE ASTM A449. ALL 5/8" BOLTS SHALL BE ASTM A307.
6. A 25'-0" SECTION OF THRIE BEAM RAIL (WITH NO SPLICE) SHALL BE INSTALLED SYMMETRICALLY WITH RESPECT TO THE SECOND TIMBER BLOCK USED AT THE END OF THE STRUCTURE.
7. THE WOOD SHIM BLOCKS SHALL BE CUT & SHAPED IN THE FIELD TO FIT THE LOCATION WITH A SNUG FIT.
8. THE BOLT HOLES SHALL BE FIELD DRILLED THRU THE GUARD RAIL, SHIM BLOCKS AND THE BARRIER RAIL AT THE SAME TIME.
9. THE GUARD RAIL SHALL NOT PROTRUDE BEYOND THE GUTTER LINE.
10. THIS DETAIL WAS DEVELOPED AND APPROVED FOR USE UNDER NCHRP REPORT 350. AS PER LADOT'S MASH IMPLEMENTATION POLICY, ITS CONTINUED USE IS ALLOWED WHILE A MASH ALTERNATIVE IS DEVELOPED OR EVALUATED.

SHEET NUMBER		PARISH		CONTROL SECTION		STATE PROJECT	
P. FOSSIER		K. BRAUNER		J. DOUCET		P. FOSSIER	
DESIGN		CHECK		DETAIL		CHECK	
REVIEW		REVIEW		REVIEW		REVIEW	
SERIES		SERIES		SERIES		SERIES	

KURT M. BRAUNER
License No. 30567
PROFESSIONAL ENGINEER
IN
LOUISIANA
4/22/22

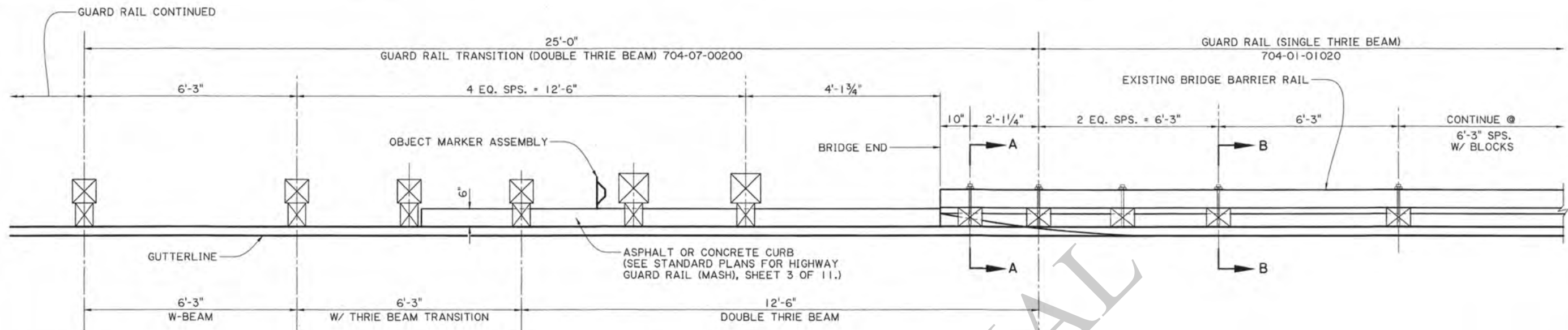
APPROVED BY CHIEF ENGINEER:

Christy P. Kelly

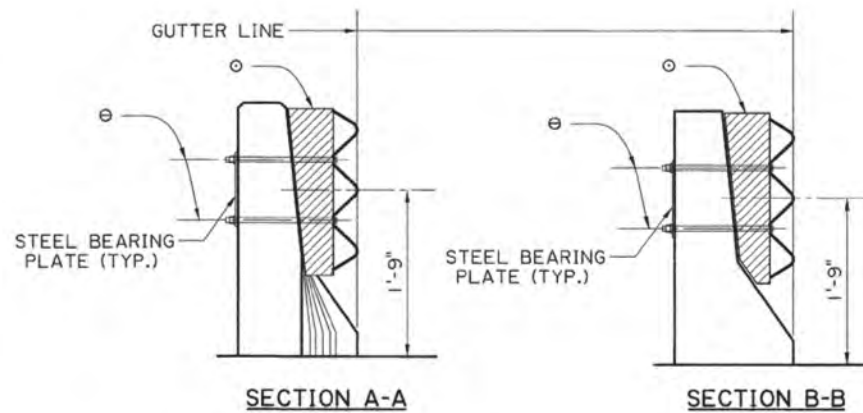
DATE: 5/3/2022

NEW JERSEY BARRIER RAIL
RETROFIT (FOR STRUCTURES
GREATER THAN 60 FT. LONG)

BRIDGE AND
STRUCTURAL
DESIGN



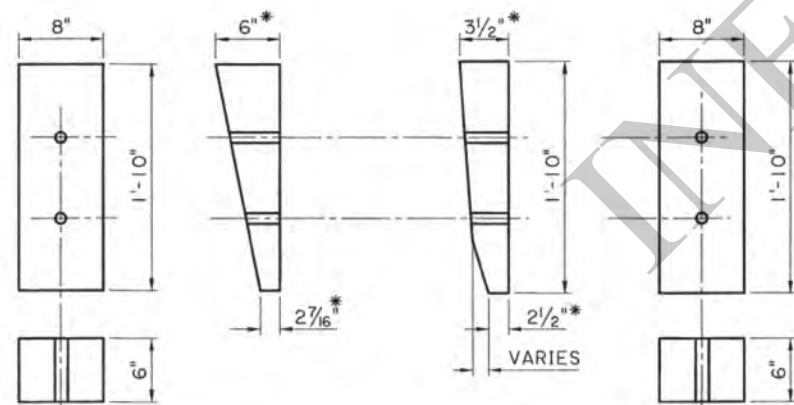
PLAN VIEW



SECTION A-A

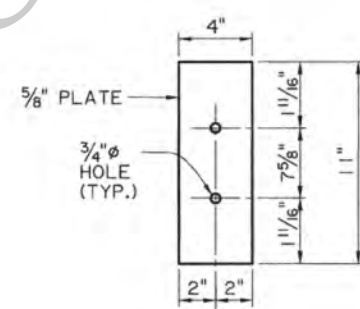
SECTION B-B

- 2 - 5/8" Ø BUTTON HEAD BOLTS WITH 5/8" BEARING PLATE, NUTS, & WASHERS. (TYP.)
- 6" X 8" X 1'-10" TREATED TIMBER BLOCK (CUT & SHAPE IN THE FIELD TO FIT).



SHIM BLOCK FOR SECTION A-A

SHIM BLOCK FOR SECTION B-B



STEEL BEARING PLATE

NOTES:

- FOR ADDITIONAL INFORMATION ON GUARD RAIL TRANSITION, SEE STANDARD PLANS FOR HIGHWAY GUARD RAIL (MASH), SHEET 3 OF 11.
- ALL HARDWARE AND TIMBER USED FOR CONNECTING THE SINGLE THRIE BEAM TO THE EXISTING BRIDGE RAIL SHALL BE PAID FOR UNDER ITEM 704-01-01020, GUARD RAIL (SINGLE THRIE BEAM), (6'-3" POST SPACING) PER LIN. FT.
- ANY DAMAGE DONE TO THE EXISTING STRUCTURE DURING INSTALLATION OF THE GUARD RAIL SHALL BE REPAIRED AT THE CONTRACTORS EXPENSE AND TO THE SATISFACTION OF THE PROJECT ENGINEER.
- GALV. STEEL OGEE WASHER MAY BE USED IN LIEU OF THE STEEL BEARING PLATE.
- ALL 5/8" Ø BOLTS SHALL BE ASTM A307.
- A 25'-0" SECTION OF GUARD RAIL (WITH NO SPLICE) SHALL BE INSTALLED SYMMETRICALLY WITH RESPECT TO THE SECOND POST ON EACH END OF THE STRUCTURE.
- THE WOOD SHIM BLOCKS SHALL BE CUT & SHAPED IN THE FIELD TO FIT THE LOCATION WITH A SNUG FIT.
- THE BOLT HOLES SHALL BE FIELD DRILLED THRU THE GUARD RAIL, SHIM BLOCKS AND THE BARRIER RAIL AT THE SAME TIME.
- THE GUARD RAIL SHALL NOT PROTRUDE BEYOND THE GUTTER LINE.
- THIS DETAIL WAS DEVELOPED AND APPROVED FOR USE UNDER NCHRP REPORT 350. AS PER LADOT'S MASH IMPLEMENTATION POLICY, ITS CONTINUED USE IS ALLOWED WHILE A MASH ALTERNATIVE IS DEVELOPED OR EVALUATED.

* DIMENSIONS ARE ASSUMED. ADJUST IN THE FIELD AS REQUIRED. HOLES SHALL BE DRILLED IN THE FIELD. SEE NOTE NO. 8.

SHEET NUMBER		PARISH		CONTROL SECTION		STATE PROJECT	
P. FOSSIER		K. BRAUNER		J. DOUCET		P. FOSSIER	
DESIGN		CHECK		DETAIL		CHECK	
REVIEW		REVIEW		REVIEW		REVIEW	
SERIES		SERIES		SERIES		SERIES	

KURT M. BRAUNER
License No. 30567
PROFESSIONAL ENGINEER
IN
LOUISIANA
4/22/22

APPROVED BY CHIEF ENGINEER:
Cheryl P. Hobb
DATE: 5/13/2022

NEW JERSEY BARRIER RAIL
RETROFIT (FOR STRUCTURES
LESS THAN 60 FT. LONG)

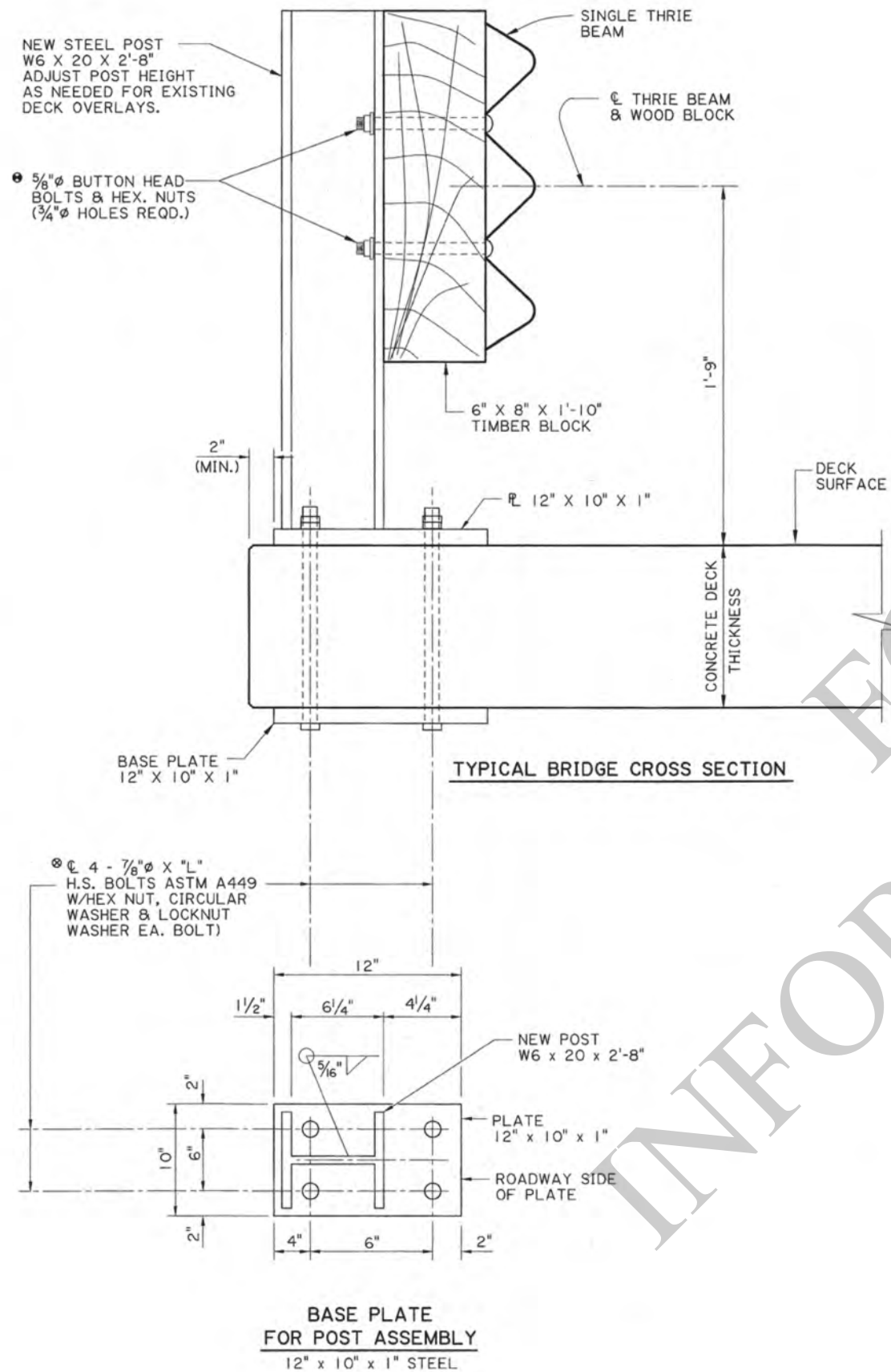
BRIDGE AND
STRUCTURAL
DESIGN



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NOTES

ALL HARDWARE INVOLVED SHALL BE REPLACED BY NEW HARDWARE.

FOR ADDITIONAL INFORMATION ON GUARD RAIL, SEE STANDARD PLANS FOR HIGHWAY GUARD RAIL (MASH).

ALL STRUCTURAL STEEL, POST AND PLATES, SHALL BE ASTM A-36 AND GALVANIZED. ALL $\frac{5}{8}$ " BOLTS SHALL BE ASTM A307.

- THE BOLTS IN THE GUARD RAIL SHALL BE LOCATED ON THE ONCOMING FLANGE TRAFFIC SIDE.

ALTHOUGH ITEM 704-01-01020 CALLS FOR 6'-3" MAX. POST SPACING, THE NEW POST FOR EXISTING PRECAST BRIDGES SHALL BE INSTALLED AT THE SAME LOCATION AS THE OLD ONES. ALL GUARD RAIL SPLICES SHALL BE MADE AT POST LOCATIONS ONLY.

ALL WORK AND MATERIALS REQUIRED TO INSTALL THE NEW GUARD RAIL SHALL BE PAID FOR UNDER ITEM 704-01-01020 GUARD RAIL (SINGLE THRIE BEAM) (6'-3" POST SPA.) PER LIN. FT.

THIS DETAIL WAS DEVELOPED AND APPROVED FOR USE UNDER NCHRP REPORT 350. AS PER LADOTD'S MASH IMPLEMENTATION POLICY, ITS CONTINUED USE IS ALLOWED WHILE A MASH ALTERNATIVE IS DEVELOPED OR EVALUATED.

SHEET NUMBER		PARISH		CONTROL SECTION		STATE PROJECT	
P. FOSSIER	C. GAUDRY	J. DOUCET	P. FOSSIER	K. BRAUNER			
DESIGN	CHECK	DETAIL	CHECK	REVIEW	SERIES		

APPROVED BY CHIEF ENGINEER
Kurt M. Brauner
DATE: 5/3/2022

GUARD RAIL REHABILITATION
(FLAT DECK PRECAST BRIDGES)

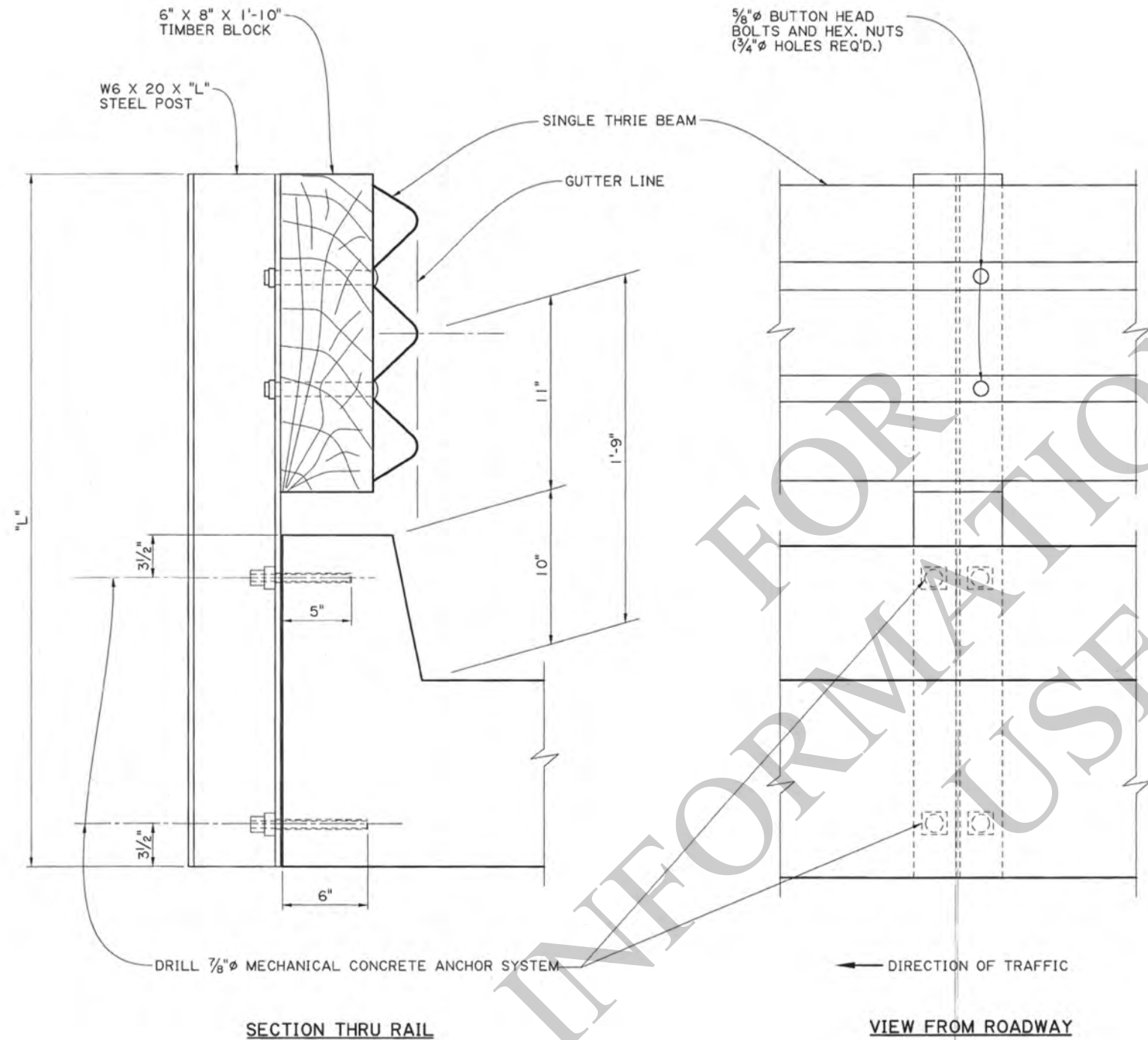
BRIDGE AND STRUCTURAL DESIGN



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NOTES

FOR ADDITIONAL INFORMATION ON GUARD RAIL, SEE STANDARD PLANS FOR HIGHWAY GUARD RAIL (MASH).

ALL WORK AND MATERIALS REQ'D. TO INSTALL GUARD RAIL ON THIS TYPE STRUCTURE SHALL BE PAID FOR UNDER ITEM 704-01-01020 GUARD RAIL (SINGLE THRIE BEAM).

ALTHOUGH ITEM 704-01-01020 CALLS FOR 6'-3" POST SPACING, THE NEW POST ON THIS TYPE STRUCTURE SHALL BE PLACED IN THE SAME LOCATION AS THE EXISTING ONES.

GUARD RAIL SPLICES SHALL BE MADE AT POST LOCATIONS ONLY. LAP IN DIRECTION OF TRAFFIC.

USE 7/8" MECHANICAL SYSTEM AS LISTED ON APPROVED MATERIALS LIST, PRODUCT CATEGORY "CONCRETE ANCHOR SYSTEMS."

ALL STRUCTURAL STEEL SHALL BE ASTM A-36 AND GALVANIZED. ALL 5/8" BOLTS SHALL BE ASTM A307.

THIS DETAIL WAS DEVELOPED AND APPROVED FOR USE UNDER NCHRP REPORT 350. AS PER LADOTD'S MASH IMPLEMENTATION POLICY, ITS CONTINUED USE IS ALLOWED WHILE A MASH ALTERNATIVE IS DEVELOPED OR EVALUATED.

SHEET NUMBER		PARISH		CONTROL SECTION		STATE PROJECT	
P. FOSSIER	C. GAUDRY	J. DOUCET	P. FOSSIER	K. BRAUNER			
DESIGN	CHECK	DETAIL	CHECK	REVIEW	SERIES		

Kurt M. Brauner
License No. 30567
PROFESSIONAL ENGINEER
IN
CIVIL ENGINEERING
4/22/22

APPROVED BY CHIEF ENGINEER:

Christy P. Smith
5/13/2022

DATE: 5/13/2022

STATE OF LOUISIANA
CONFIDENTIAL

SIDE MOUNTED GUARD RAIL
FOR BRIDGES

STANDARD
PLAN

GRR-10

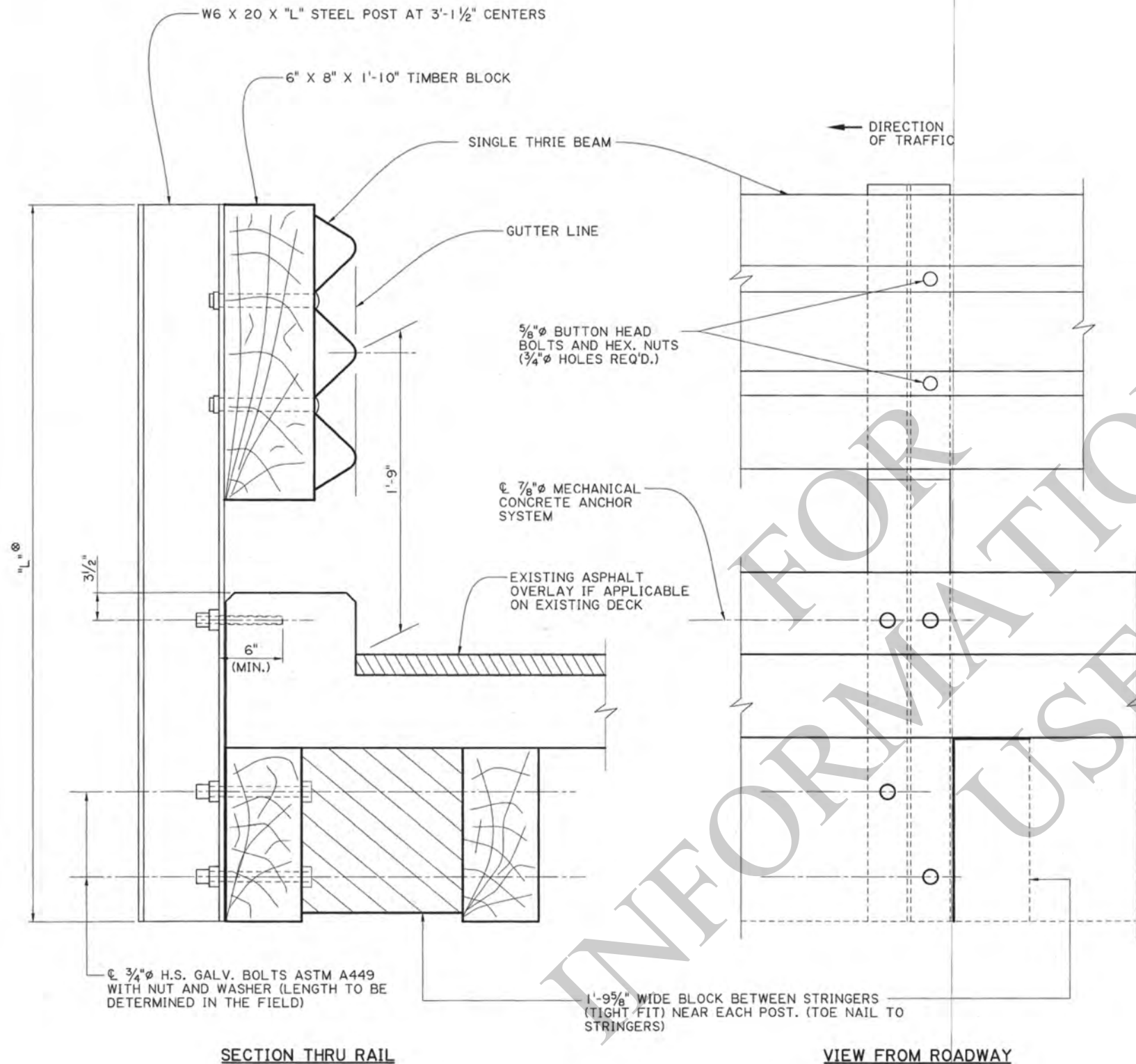
BRIDGE AND
STRUCTURAL
DESIGN



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NOTES

FOR ADDITIONAL INFORMATION ON GUARD RAIL, SEE STANDARD PLANS FOR HIGHWAY GUARD RAIL (MASH).

ALL WORK AND MATERIALS REQ'D. TO INSTALL GUARD RAIL ON BRIDGE SHALL BE PAID FOR UNDER ITEM 704-01-01020 GUARD RAIL (SINGLE THRIE BEAM) (6'-3\"/>

GUARD RAIL SPLICES SHALL BE MADE AT POST LOCATIONS ONLY. LAP IN DIRECTION OF TRAFFIC.

USE 7/8\"/>

ALL STEEL SHALL BE ASTM A-36 AND GALVANIZED.

ALL 5/8\"/>

⊗ W6 x 20 POST TO BE FIELD MEASURED TO DETERMINE LENGTH "L" BY CONTRACTOR.

THIS DETAIL WAS DEVELOPED AND APPROVED FOR USE UNDER NCHRP REPORT 350. AS PER LADOT'S MASH IMPLEMENTATION POLICY, ITS CONTINUED USE IS ALLOWED WHILE A MASH ALTERNATIVE IS DEVELOPED OR EVALUATED.

SHEET NUMBER		PARISH		CONTROL SECTION		STATE PROJECT	
DESIGN	CHECK	P. FOSSIER	C. GAUDRY	DETAIL	CHECK	P. FOSSIER	K. BRAUNER
REVIEW		SERIES					

APPROVED BY CHIEF ENGINEER
Christy P. Foy
DATE: 5/13/2022

**SIDE MOUNTED GUARD RAIL
(CONCRETE DECK WITH
TIMBER STRINGERS)**

BRIDGE AND STRUCTURAL DESIGN

STANDARD PLAN

GRR-11

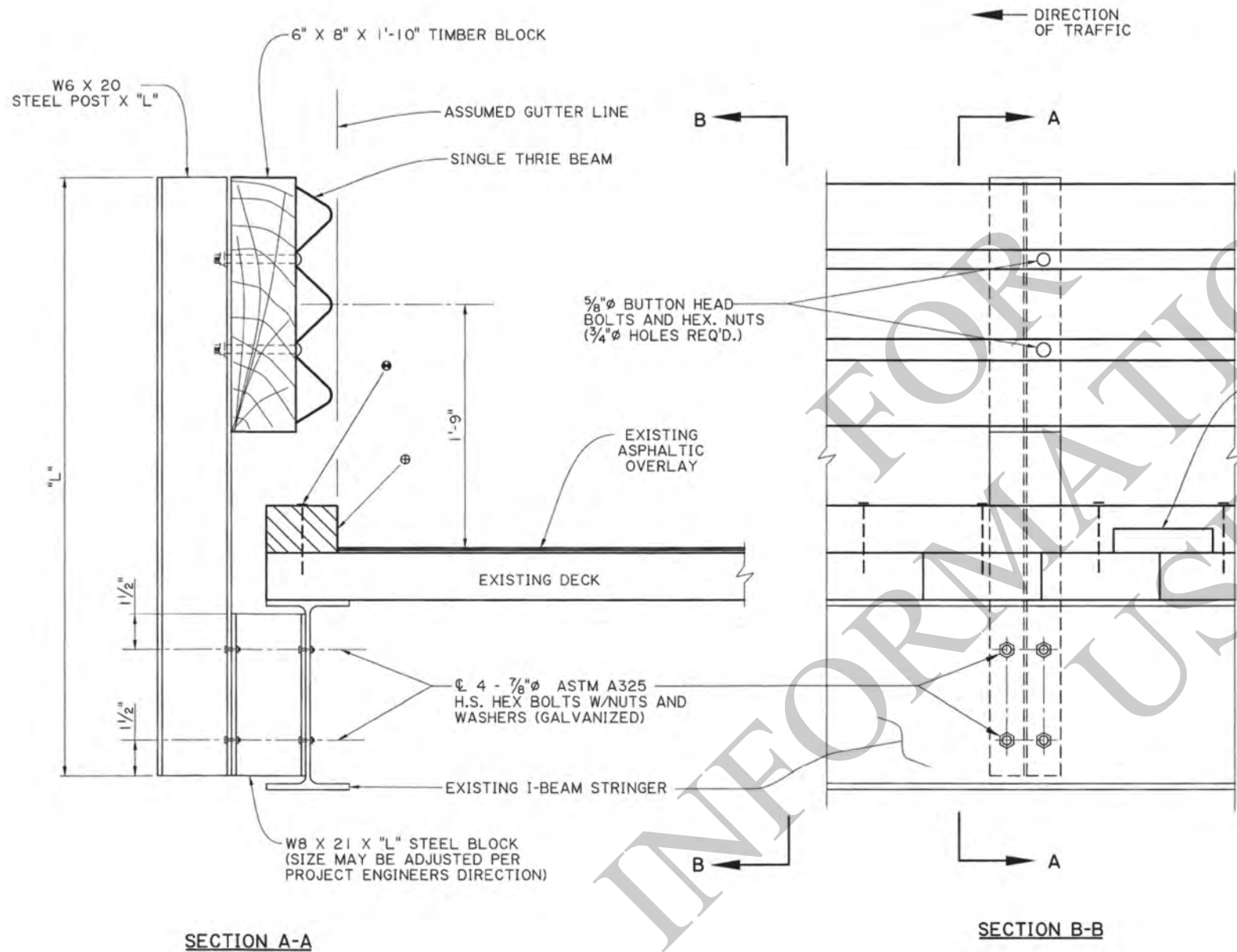


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5/12/2022

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- ⊖ 2" X 1'-0" NOTCH FOR DRAINAGE
- ⊕ 4" X 6" X LGTH. OF BRIDGE FELLOE GUARD (NEW) (NOTCH FOR DRAINAGE)
- ⊕ 6⁷/₈" SPIKE AT EACH FLOOR PLANK



NOTES

ALL WORK AND MATERIAL (INCLUDING THE NEW FELLOE GUARD) REQUIRED TO INSTALL THE NEW BRIDGE RAIL SHALL BE PAID FOR UNDER ITEM 704-01-01020 GUARDRAIL (SINGLE THRIE BEAM) (6'-3" POST SPA.)

EXISTING ASPHALT SHALL BE CLEARED FROM AREA WHERE FELLOE GUARD IS TO BE PLACED SO THAT THE FELLOE GUARD WILL BE ON THE TIMBER DECK.

POST SHALL BE LOCATED AT EACH BENT AND AT INTERMEDIATE POINTS NOT TO EXCEED 6'-3" (EQUALLY SPACED)

IF DIRECTED BY THE PROJECT ENGINEER, A DIAPHRAGM SHALL BE PLACED AT EACH INTERMEDIATE POST BETWEEN THE FIRST AND SECOND STRINGER. (TO BE INCLUDED IN 704-01-01020.

"L" (POST HEIGHT & STEEL BLOCK) SHALL BE DETERMINED IN THE FIELD.

FOR ADDITIONAL INFORMATION ON GUARDRAIL, SEE STANDARD PLANS FOR HIGHWAY GUARD RAIL (MASH).

ALL STRUCTURAL STEEL SHALL BE ASTM A36 AND GALVANIZED. ALL 5/8" BOLTS SHALL BE ASTM A307.

THIS DETAIL WAS DEVELOPED AND APPROVED FOR USE UNDER NCHRP REPORT 350. AS PER LADOTD'S MASH IMPLEMENTATION POLICY, ITS CONTINUED USE IS ALLOWED WHILE A MASH ALTERNATIVE IS DEVELOPED OR EVALUATED.

SHEET NUMBER		PARISH		CONTROL SECTION		STATE PROJECT	
P. FOSSIER		C. GAUDRY		J. DOUCET		P. FOSSIER	
DESIGN		CHECK		DETAIL		CHECK	
REVIEW		SERIES		K. BRAUNER		SERIES	

KURT M. BRAUNER
License No. 30567
PROFESSIONAL ENGINEER
IN
CIVIL ENGINEERING
4/22/22

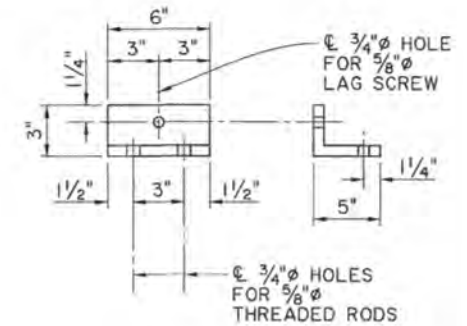
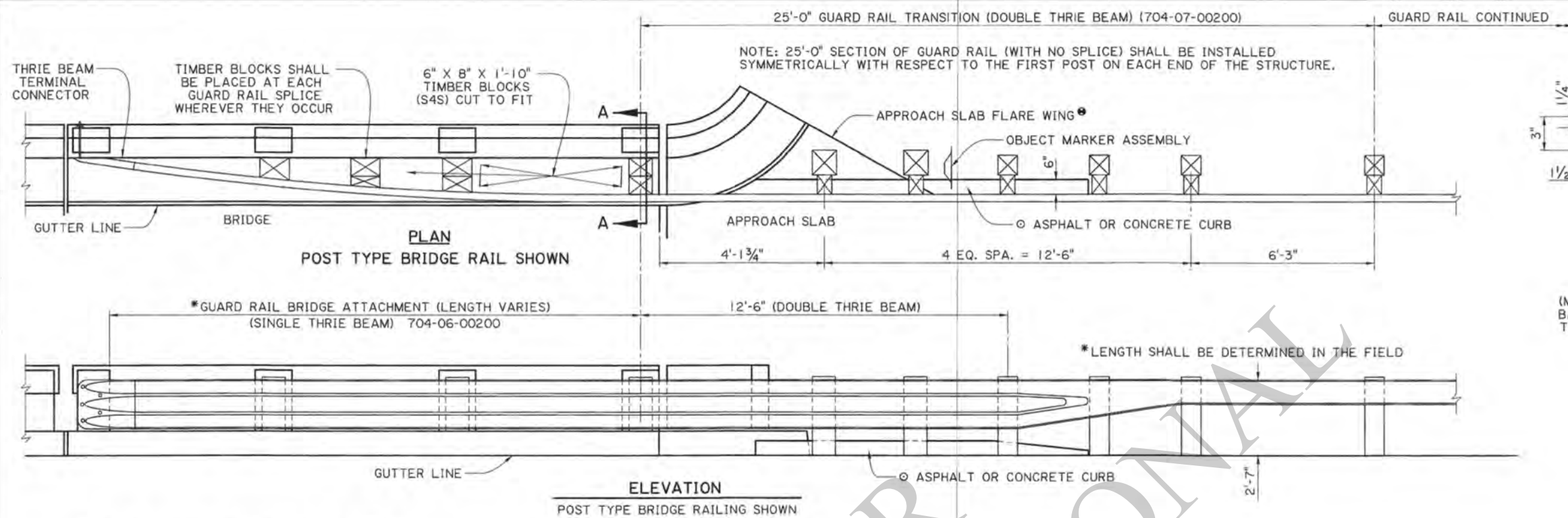
APPROVED BY CHIEF ENGINEER: *Christy P. Hogg* DATE: 5/3/2022

STATE OF LOUISIANA
DEPARTMENT OF TRANSPORTATION & DEVELOPMENT

SIDE MOUNTED BRIDGE RAIL

BRIDGE AND STRUCTURAL DESIGN

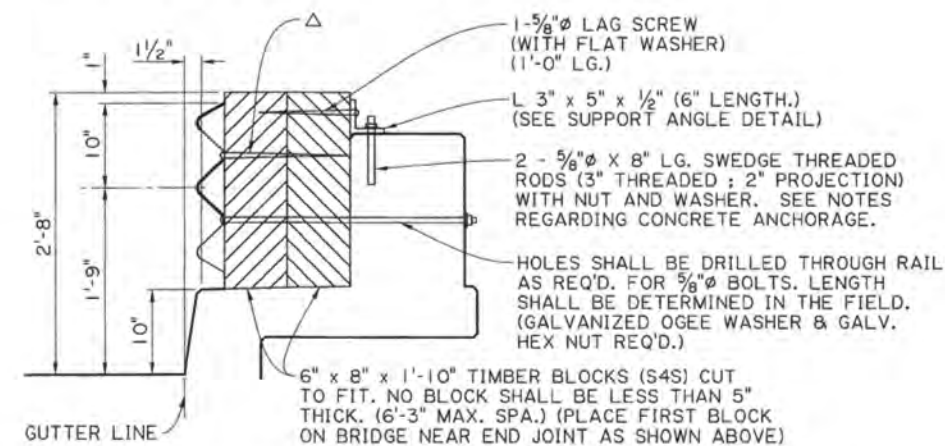
GRR-12



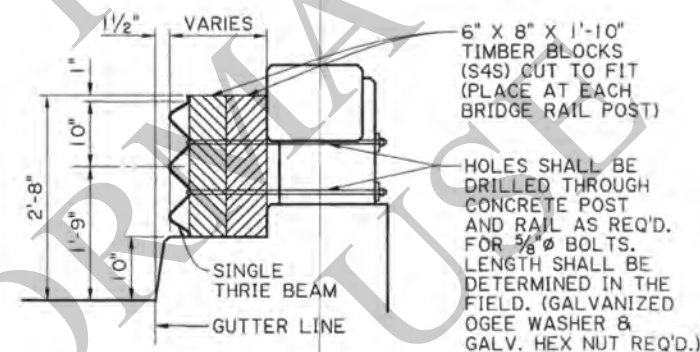
(MOUNT TO TOP OF RAIL FOR BLOCK BACKUP) THE HOLES MAY BE OFFSET TO ACHIEVE INSTALLATION BUT THE 1/2" EDGE DISTANCE SHALL BE MAINTAINED.

SUPPORT ANGLE

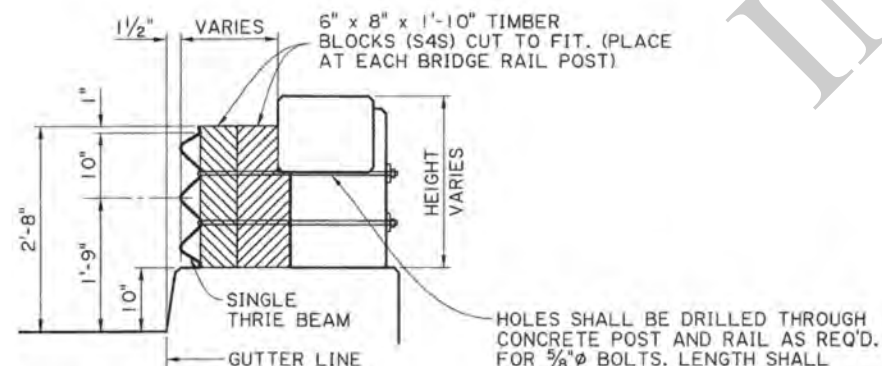
Δ 5/8" LAG SCREW (WITH PLATE WASHER) SHALL PENETRATE TO THE BACK OF THE REAR BLOCK (LENGTH TO BE DETERMINED IN THE FIELD)



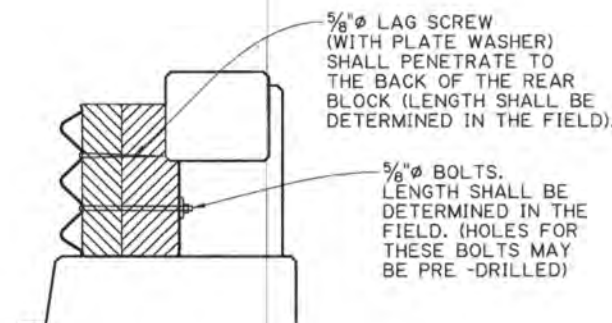
SECTION A-A
SOLID WALL RAILING



SECTION A-A
POST AND RAIL BRIDGE RAIL



SECTION A-A
POST AND RAIL BRIDGE RAIL



VIEW AT GUARD RAIL SPLICES

NOTES:

FOR ADDITIONAL INFORMATION ON GUARD RAIL, SEE STANDARD PLANS FOR HIGHWAY GUARD RAIL (MASH).

○ FOR CURB & TRANSITION INFORMATION, SEE STANDARD PLANS FOR HIGHWAY GUARD RAIL (MASH), SHEET 3 OF 11.

ALL MATERIALS AND LABOR REQ'D. TO PLACE THE GUARD RAIL ONTO THE BRIDGE SHALL BE PAID FOR UNDER ITEM 704-06-00200.

IF THE EXISTING CONCRETE IS DAMAGED DUE TO DRILLING HOLES FOR BOLTS AND RODS, THE CONTRACTOR SHALL REPAIR THE DAMAGE WITH THE APPROPRIATE MATERIALS AT HIS EXPENSE AND TO THE SATISFACTION OF THE PROJECT ENGINEER.

EXISTING HANDRAIL SHALL BE REMOVED AND DISPOSED OF BY THE CONTRACTOR AS DIRECTED BY THE PROJECT ENGINEER.

ALL HOLES (VERTICAL OR HORIZONTAL) DRILLED INTO AN EXISTING CONCRETE STRUCTURE SHALL BE 3/4". THEY SHALL BE CLEANED WITH COMPRESSED AIR AND MADE FREE OF ANY OIL OR RESIDUE. HOLES SHALL BE FILLED WITH AN EPOXY INJECTION SYSTEM LISTED ON THE APPROVED MATERIALS LIST, PRODUCT CATEGORY "CONCRETE ANCHOR SYSTEMS." PLACE ROD IN HOLE IMMEDIATELY AND WAIT FOR THE MANUFACTURER'S CURE TIME.

THE LOWER BOLTS IN THE GUARD RAIL AT EACH POST SHALL BE ON THE ONCOMING TRAFFIC SIDE.

IF TIMBER BLOCKS ARE LESS THAN 3" ABOVE THE CONCRETE RAIL IN THE SOLID RAIL ALTERNATE, THE METHOD SHOWN IN THE POST AND RAIL BRIDGE RAIL ALTERNATE SHALL BE UTILIZED.

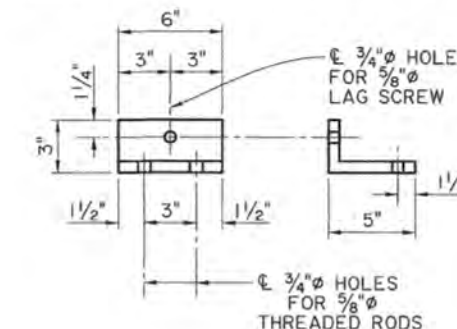
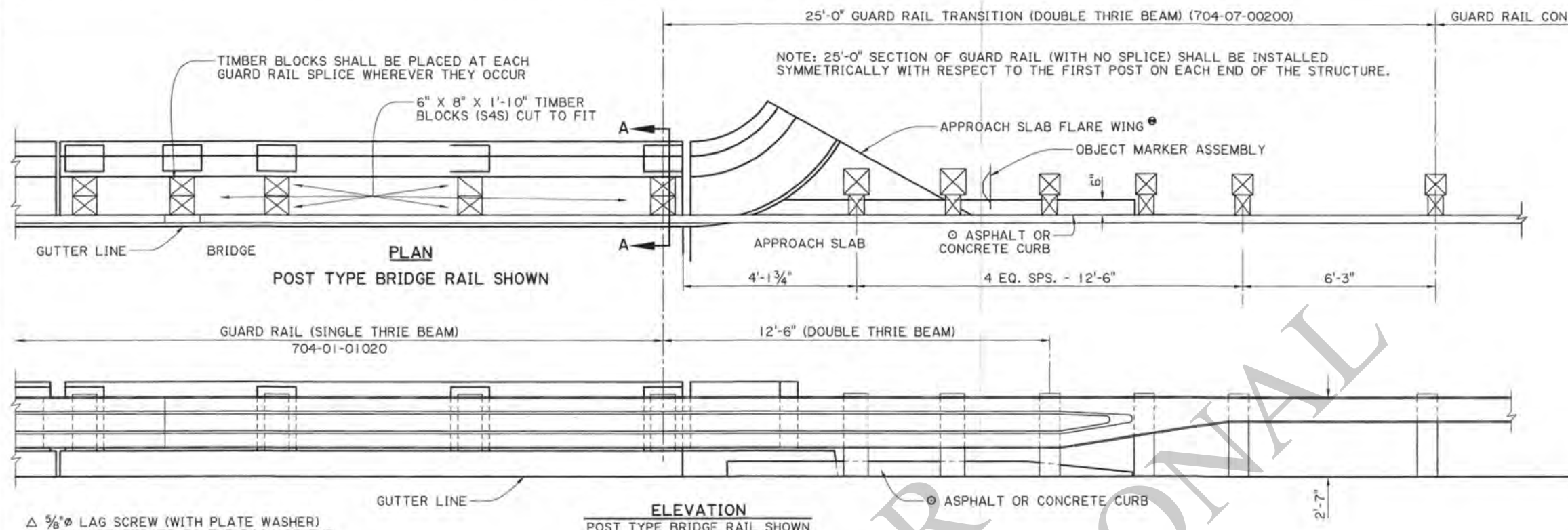
THE LENGTHS OF THE LAG SCREWS SHALL BE VERIFIED BY THE PROJECT ENGINEER BEFORE INSTALLATION TO ACHIEVE THE PENETRATION CALLED FOR IN THE SOLID WALL ALTERNATE.

● IF APPROACH SLAB FLARES EXIST, A 1'-0" X 1'-0" HOLE SHALL BE CUT THRU THE CONCRETE IN THE PROPER LOCATION TO INSTALL POST. AFTER POST IS IN PLACE, COMPACT SOIL AROUND POST AND REDRESS THE SLAB WITH CONCRETE TO THE FINISHED ELEVATION. (NO DIRECT PAY).

ALL STRUCTURAL STEEL SHALL BE ASTM A36 AND GALVANIZED. ALL 5/8" BOLTS SHALL BE ASTM A307.

THIS DETAIL WAS DEVELOPED AND APPROVED FOR USE UNDER NCHRP REPORT 350. AS PER LADOTD'S MASH IMPLEMENTATION POLICY, ITS CONTINUED USE IS ALLOWED WHILE A MASH ALTERNATIVE IS DEVELOPED OR EVALUATED.

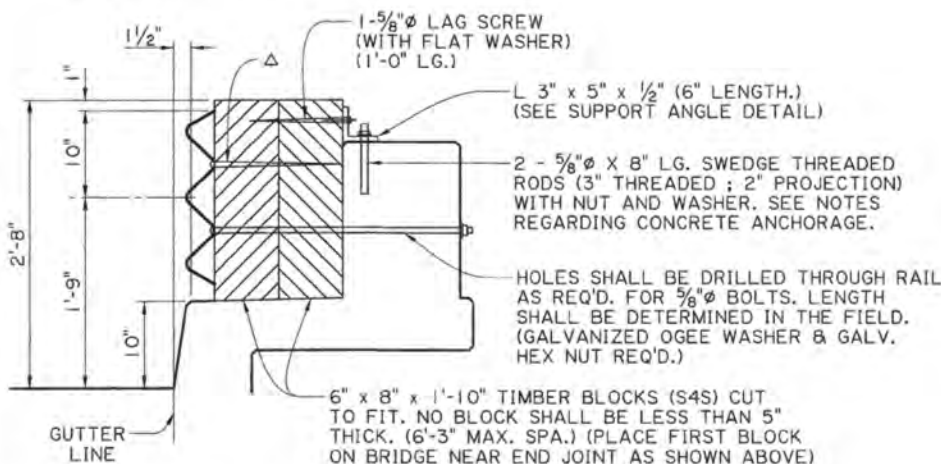
SHEET NUMBER		PARISH		CONTROL SECTION		STATE PROJECT	
P. FOSSIER		C. GAUDRY		J. DOUCET		P. FOSSIER	
DESIGN		CHECK		DETAIL		CHECK	
REVIEW		K. BRAUNER		SERIES		DATE	
APPROVED BY CHIEF ENGINEER <i>Christy P. Hays</i> DATE: 5/3/2022							
GUARD RAIL TERMINATING ON BRUSH CURB BRIDGE RAIL STANDARD PLAN GRR-13							



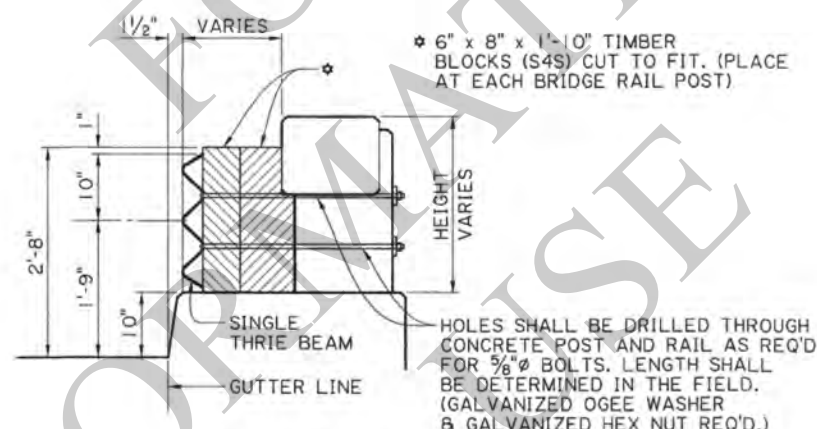
(MOUNT TO TOP OF RAIL FOR BLOCK BACKUP) THE HOLES MAY BE OFFSET TO ACHIEVE INSTALLATION BUT THE 1 1/2" EDGE DISTANCE SHALL BE MAINTAINED.

SUPPORT ANGLE

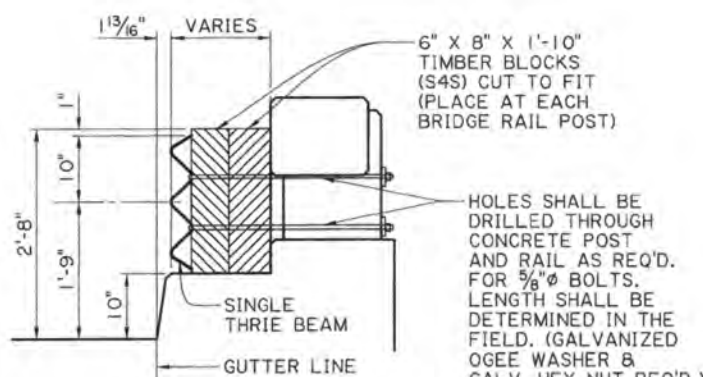
Δ 5/8" LAG SCREW (WITH PLATE WASHER) SHALL PENETRATE TO THE BACK OF THE REAR BLOCK (LENGTH TO BE DETERMINED IN THE FIELD)



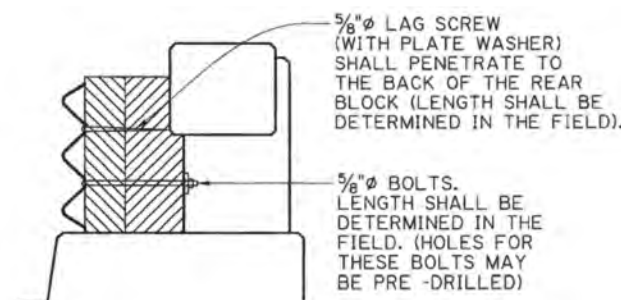
SECTION A-A
SOLID WALL RAILING



SECTION A-A
POST AND RAIL BRIDGE RAIL



SECTION A-A
POST AND RAIL BRIDGE RAIL



VIEW AT GUARD RAIL SPLICES

NOTES:

FOR ADDITIONAL INFORMATION ON GUARD RAIL, SEE STANDARD PLANS FOR HIGHWAY GUARD RAIL (MASH).

ALL MATERIALS AND LABOR REQ'D. TO PLACE THE GUARD RAIL ONTO THE BRIDGE SHALL BE PAID FOR UNDER ITEM 704-01-01020

○ FOR CURB & TRANSITION INFORMATION, SEE STANDARD PLANS FOR HIGHWAY GUARD RAIL (MASH), SHEET 3 OF 11.

EXISTING HANDRAIL SHALL BE REMOVED AND DISPOSED OF BY THE CONTRACTOR AS DIRECTED BY THE PROJECT ENGINEER.

ALL HOLES (VERTICAL OR HORIZONTAL) DRILLED INTO AN EXISTING CONCRETE STRUCTURE SHALL BE 3/4". THEY SHALL BE CLEANED WITH COMPRESSED AIR AND MADE FREE OF ANY OIL OR RESIDUE. HOLES SHALL BE FILLED WITH AN EPOXY INJECTION SYSTEM LISTED ON THE APPROVED MATERIALS LIST, PRODUCT CATEGORY "CONCRETE ANCHOR SYSTEMS." PLACE ROD IN HOLE IMMEDIATELY AND WAIT FOR THE MANUFACTURER'S CURE TIME.

THE LOWER BOLTS IN THE GUARD RAIL AT EACH POST SHALL BE ON THE ONCOMING TRAFFIC SIDE.

IF TIMBER BLOCKS ARE LESS THAN 3" ABOVE THE CONCRETE RAIL IN THE SOLID RAIL ALTERNATE, THE METHOD SHOWN IN THE POST AND RAIL BRIDGE RAIL ALTERNATE SHALL BE UTILIZED.

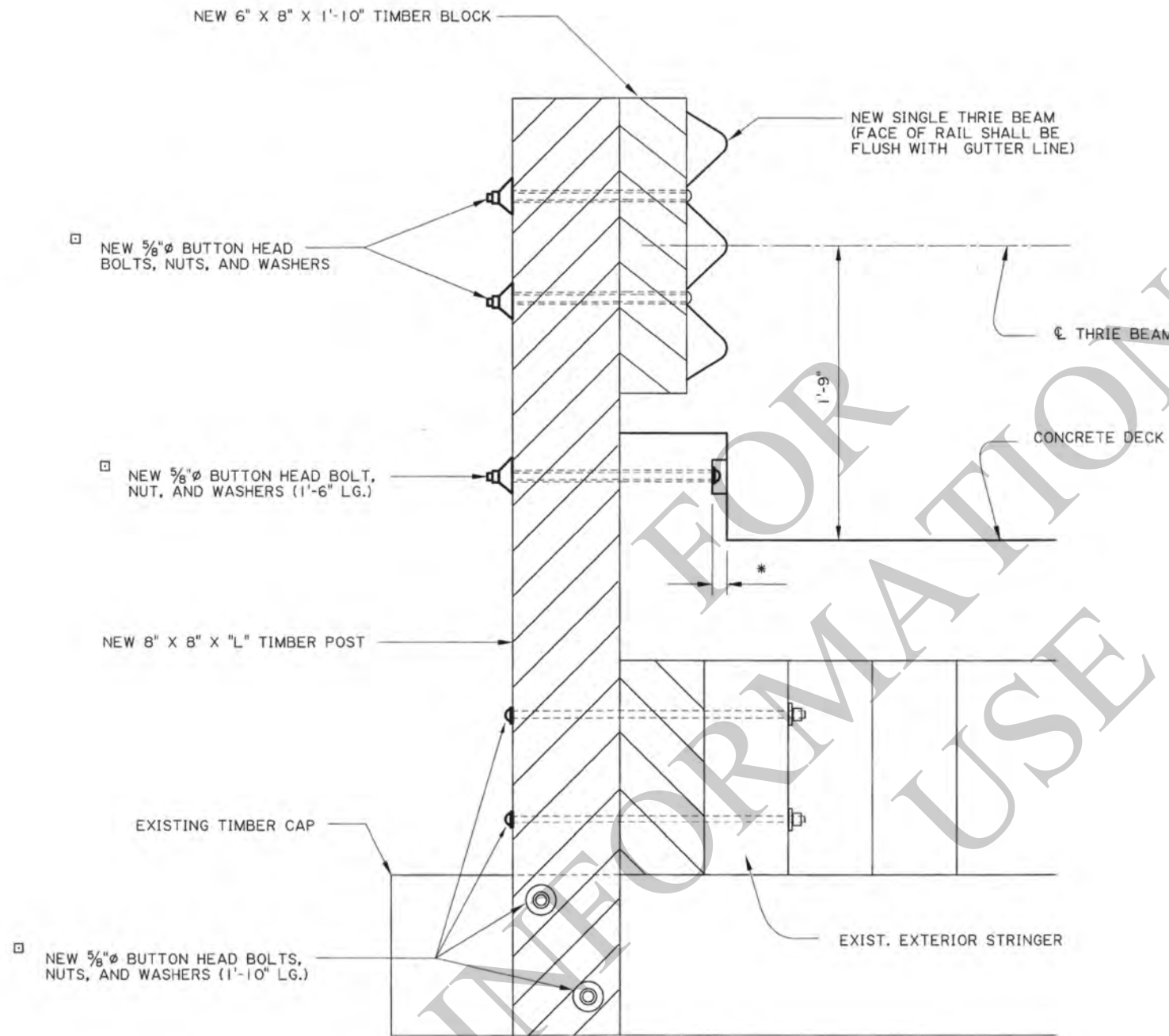
THE LENGTHS OF THE LAG SCREWS SHALL BE VERIFIED BY THE PROJECT ENGINEER BEFORE INSTALLATION TO ACHIEVE THE PENETRATION CALLED FOR IN THE SOLID WALL ALTERNATE.

● IF APPROACH SLAB FLARES EXIST, A 1'-0" X 1'-0" HOLE SHALL BE CUT THRU THE CONCRETE IN THE PROPER LOCATION TO INSTALL POST. AFTER POST IS IN PLACE, COMPACT SOIL AROUND POST AND REDRESS THE SLAB WITH CONCRETE TO THE FINISHED ELEVATION. (NO DIRECT PAY).

ALL STRUCTURAL STEEL SHALL BE ASTM A36 AND GALVANIZED. ALL 5/8" BOLTS SHALL BE ASTM A307.

THIS DETAIL WAS DEVELOPED AND APPROVED FOR USE UNDER NCHRP REPORT 350. AS PER LADOT'S MASH IMPLEMENTATION POLICY, ITS CONTINUED USE IS ALLOWED WHILE A MASH ALTERNATIVE IS DEVELOPED OR EVALUATED.

SHEET NUMBER		DATE	
P. FOSSIER		5/13/2022	
C. GAUDRY	J. DOUCET	K. BRAUNER	
P. FOSSIER	P. FOSSIER	K. BRAUNER	
K. BRAUNER	K. BRAUNER	K. BRAUNER	
STATE OF LOUISIANA KURT M. BRAUNER Louisiana No. 50667 PROFESSIONAL ENGINEER IN CIVIL ENGINEERING 4/22/22			
APPROVED BY CHIEF ENGINEER			
GUARD RAIL CONTINUOUS ACROSS BRUSH CURB BRIDGE RAIL			
GRR-14			
DOTD LOUISIANA DEPARTMENT OF TRANSPORTATION & DEVELOPMENT BRIDGE AND STRUCTURAL DESIGN			



NOTES

FOR ADDITIONAL INFORMATION ON GUARD RAIL, SEE STANDARD PLANS FOR HIGHWAY GUARD RAIL (MASH).

ALL TIMBER SHALL BE TREATED SOUTHERN YELLOW PINE OR DOUGLAS FIR. (CUT TO FIT). ALL HARDWARE & NAILS INVOLVED SHALL BE REPLACED WITH NEW MATERIALS AND SHALL BE GALVANIZED.

POST SPACING VARIES FROM STRUCTURE TO STRUCTURE. ORIGINAL POST SPACING SHALL BE VERIFIED BY THE PROJECT ENGINEER AND NEW POSTS SHALL BE PLACED AT THESE LOCATIONS. ANY POST AT OTHER THAN THE ORIGINAL POST SPACING SHALL BE REMOVED.

GUARD RAIL SPLICES SHALL BE MADE AT POST LOCATIONS ONLY. LAP IN DIRECTION OF TRAFFIC.

* HOLES IN CONCRETE CURB SHALL BE COUNTER-SUNK SO THE BOLT HEAD WILL NOT PROTRUDE OUTSIDE THE FACE OF CURB. GROUT HOLES WITH APPROPRIATE MATERIAL AFTER BOLT HAS BEEN TIGHTENED.

ALL WORK AND MATERIALS REQ'D. TO COMPLETE GUARD RAIL ON BRIDGE SHALL BE PAID FOR UNDER ITEM 704-01-01020 GUARD RAIL, (SINGLE THRIE BEAM) (6'-3" POST SPA.) PER LIN. FT.

WHEN EXTERIOR STRINGER IS REQ'D. TO BE REPLACED IT SHALL BE DONE AS DIRECTED BY THE PROJECT ENGINEER AND PAID FOR UNDER FORCE ACCOUNT.

□ ALL 5/8"Ø BOLTS SHALL BE ASTM A307.

ALL BOLT LENGTHS SHALL BE VERIFIED BY FIELD MEASUREMENTS.

THIS DETAIL WAS DEVELOPED AND APPROVED FOR USE UNDER NCHRP REPORT 350. AS PER LADOTD'S MASH IMPLEMENTATION POLICY, ITS CONTINUED USE IS ALLOWED WHILE A MASH ALTERNATIVE IS DEVELOPED OR EVALUATED.

SHEET NUMBER		PARISH		CONTROL SECTION		STATE PROJECT	
P. FOSSIER		C. GAUDRY		J. DOUCET		P. FOSSIER	
DESIGN		CHECK		DETAIL		CHECK	
REVIEW		K. BRAUNER		SERIES		*	

APPROVED BY CHIEF ENGINEER:

DATE: 5/3/2022

GUARD RAIL REHABILITATION
(CONCRETE DECK)

BRIDGE AND STRUCTURAL DESIGN

DOTD
LOUISIANA DEPARTMENT OF
TRANSPORTATION & DEVELOPMENT

STANDARD
PLAN

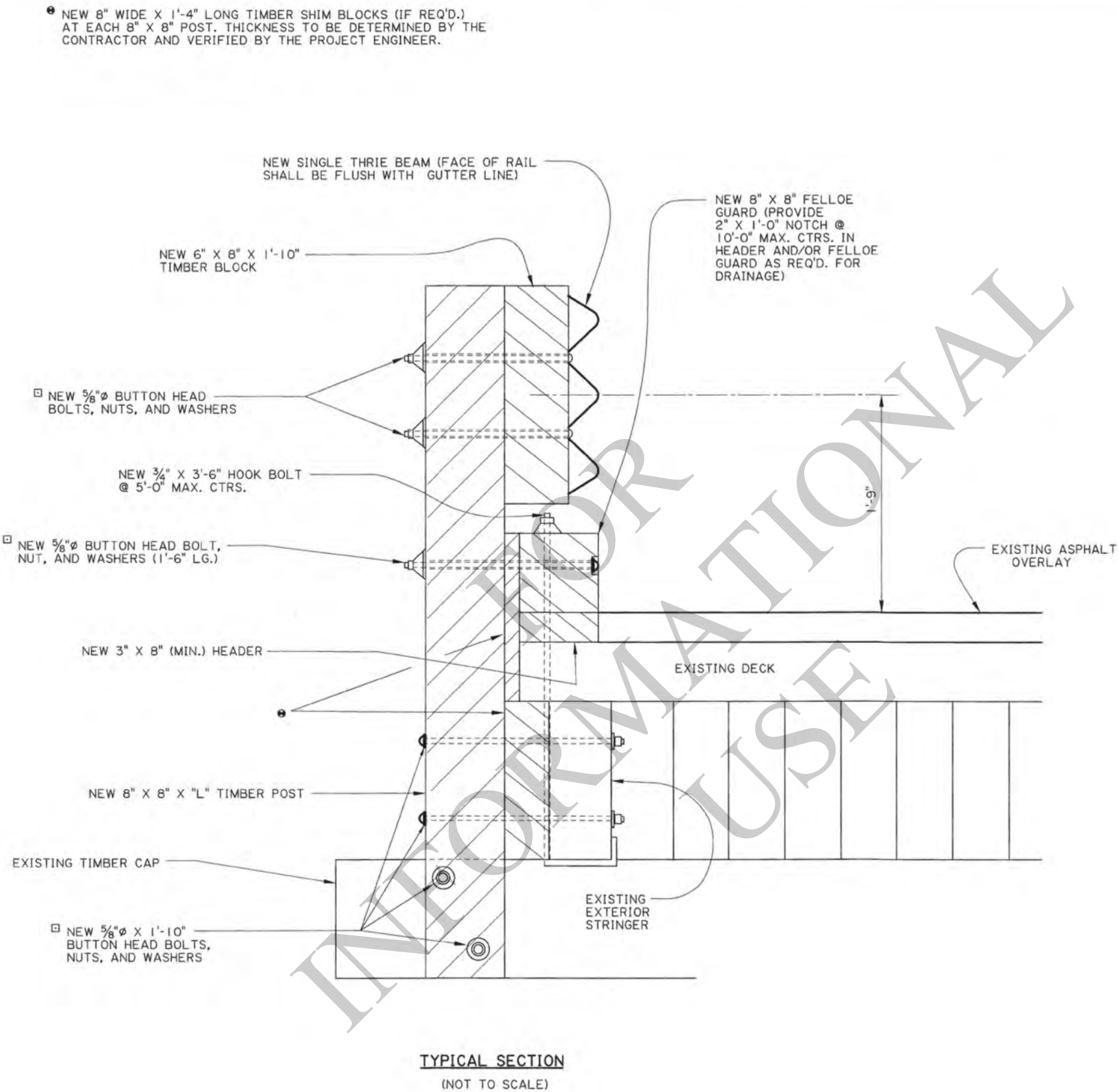
GRR-15



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5/12/2022

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NOTES

FOR ADDITIONAL INFORMATION ON GUARD
RAIL, SEE STANDARD PLANS FOR HIGHWAY
GUARD RAIL (MASH).

ALL TIMBER SHALL BE TREATED SOUTHERN
YELLOW PINE OR DOUGLAS FIR. (CUT TO FIT)
ALL HARDWARE & NAILS INVOLVED SHALL BE
REPLACED WITH NEW MATERIALS AND SHALL
BE GALVANIZED.

POST SPACING VARIES FROM STRUCTURE TO
STRUCTURE. ORIGINAL POST SPACING SHALL
BE VERIFIED BY THE PROJECT ENGINEER AND
NEW POST SHALL BE PLACED AT THESE
LOCATIONS. ANY POST OTHER THAN THE
ORIGINAL POST SPACING SHALL BE REMOVED.

GUARD RAIL SPLICES SHALL BE MADE AT
POST LOCATIONS ONLY. LAP IN DIRECTION
OF TRAFFIC.

ALL WORK AND MATERIALS REQ'D. TO
COMPLETE GUARD RAIL ON BRIDGE SHALL
BE PAID FOR UNDER ITEM 704-01-01020
GUARD RAIL, (SINGLE THRIE BEAM)
(6'-3" POST SPA.) PER LIN. FT.

WHEN EXTERIOR STRINGER IS REQ'D. TO BE
REPLACED IT SHALL BE DONE AS DIRECTED
BY THE PROJECT ENGINEER AND PAID FOR
UNDER FORCE ACCOUNT.

ALL 5/8"Ø BOLTS SHALL BE ASTM A307.

ALL BOLT LENGTHS SHALL BE VERIFIED
BY FIELD MEASUREMENTS.

THIS DETAIL WAS DEVELOPED AND APPROVED
FOR USE UNDER NCHRP REPORT 350. AS PER
LADOTD'S MASH IMPLEMENTATION POLICY, ITS
CONTINUED USE IS ALLOWED WHILE A MASH
ALTERNATIVE IS DEVELOPED OR EVALUATED.

SHEET NUMBER		PARISH		CONTROL SECTION		STATE PROJECT	
P. FOSSIER		C. GAUDRY		J. DOUCET		P. FOSSIER	
DESIGN		CHECK		DETAIL		CHECK	
REVIEW		REVIEW		REVIEW		REVIEW	
SERIES		SERIES		SERIES		SERIES	

APPROVED BY CHIEF ENGINEER:
Kurt M. Brauner
DATE: 5/13/2022

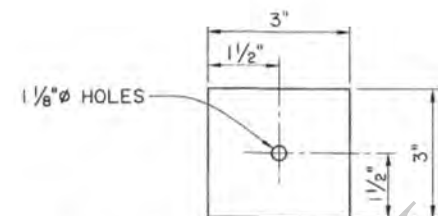
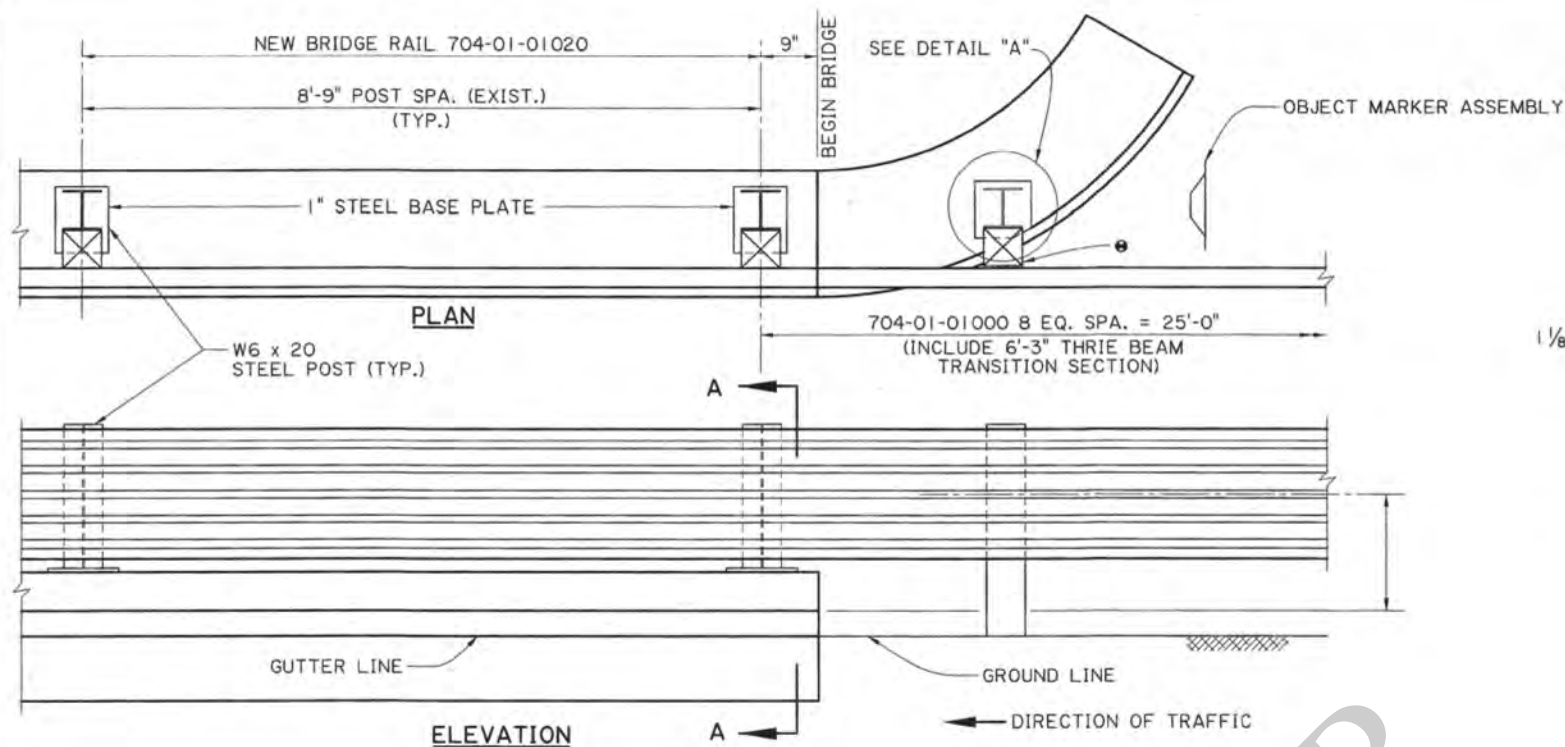
GUARD RAIL REHABILITATION
(TIMBER DECK)

STANDARD
PLAN

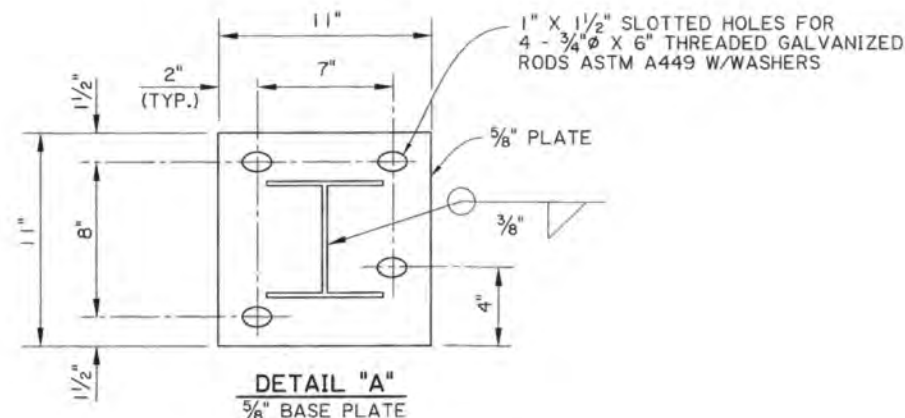
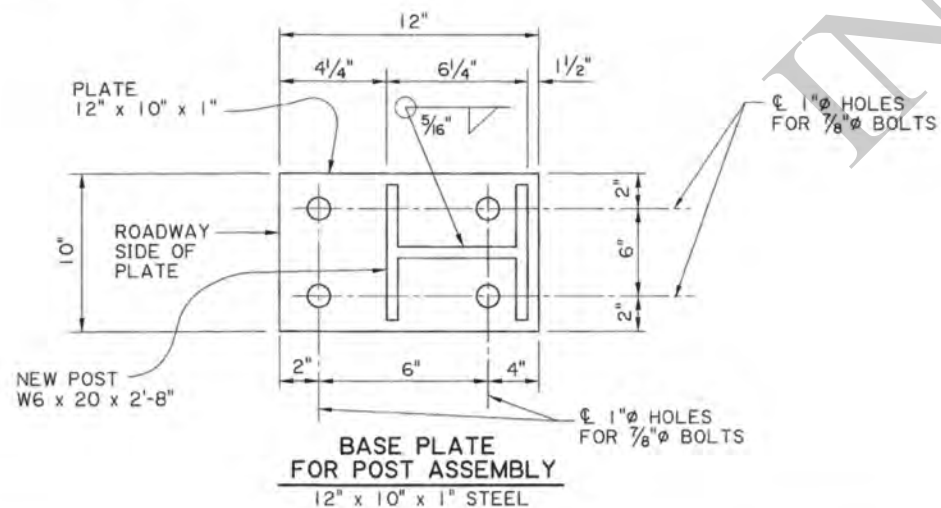
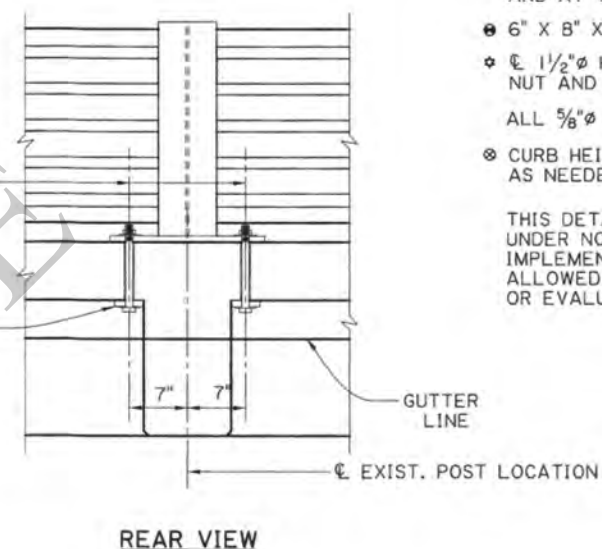
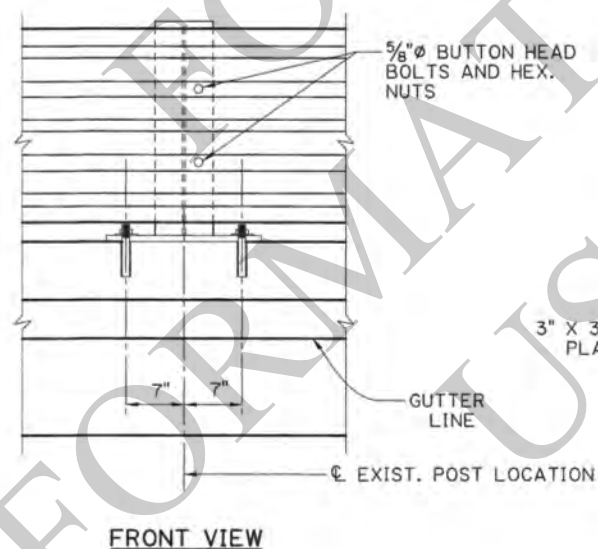
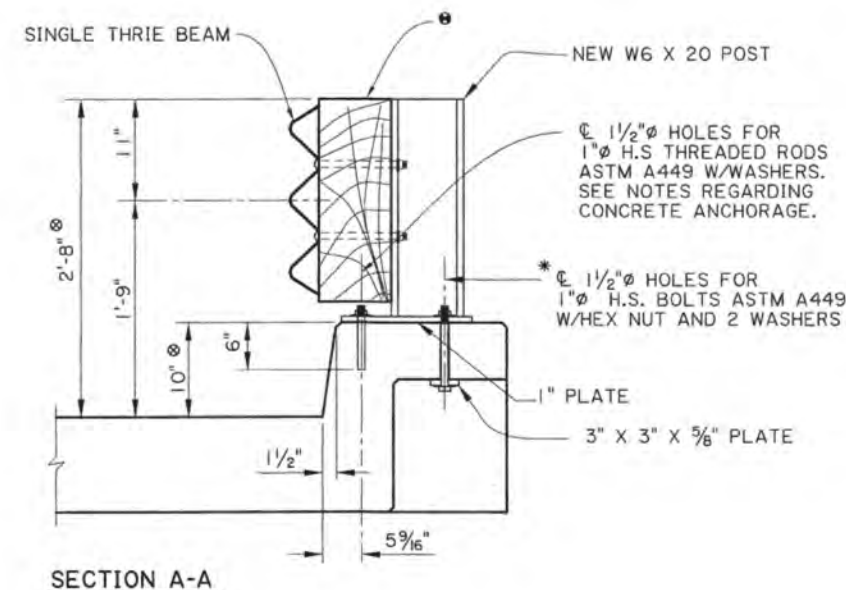
DOTD
LOUISIANA DEPARTMENT OF
TRANSPORTATION & DEVELOPMENT

BRIDGE AND
STRUCTURAL
DESIGN

GRR-16



5/8" GALVANIZED STEEL PLATE



NOTES:

FOR ADDITIONAL INFORMATION ON GUARD RAIL, SEE STANDARD PLANS FOR HIGHWAY GUARD RAIL (MASH).

ALL WORK AND MATERIALS REQ'D. TO INSTALL GUARD RAIL ON THE STRUCTURE SHALL BE PAID FOR UNDER ITEM 704-01-01020

ANY DAMAGE DONE TO THE STRUCTURE DURING CONSTRUCTION NOT RELATED TO THE WORK REQUIRED SHALL BE REPAIRED AT THE CONTRACTORS EXPENSE AND TO THE SATISFACTION OF THE PROJECT ENGINEER.

ALL HOLES (VERTICAL OR HORIZONTAL) DRILLED INTO AN EXISTING CONCRETE STRUCTURE SHALL BE CLEANED WITH COMPRESSED AIR AND MADE FREE OF ANY OIL OR RESIDUE. HOLES SHALL BE FILLED WITH AN INJECTION SYSTEM LISTED ON THE APPROVED MATERIALS LIST, PRODUCT CATEGORY "CONCRETE ANCHOR SYSTEMS." PLACE ROD IN HOLE IMMEDIATELY AND WAIT FOR THE MANUFACTURER'S CURE TIME.

NOMINAL POST SPACING ON THIS SPAN IS 8'-9" (ORIGINAL DESIGN). NEW POST ARE REQUIRED AND SHALL BE INSTALLED AS SHOWN. GUARD RAIL SPLICES SHALL BE MADE AT POST LOCATIONS ONLY. THE POST LOCATED ON THE FLARED BRIDGE END SHALL BE INSTALLED AS SHOWN. IF A FLARED END DOES NOT EXIST A NORMAL 6" X 8" TIMBER POST OR A APPROVED ALTERNATE SHALL BE USED.

* NOTE: (AT END SPAN POST LOCATION ONLY) THE INTERIOR BOLT SHALL BE AS SHOWN. THE OUTER BOLT NEARER TO END JOINT) SHALL BE DRILLED IN THE SAME MANNER AS THE FRONT ANCHOR BOLTS.

ALL STRUCTURAL STEEL SHALL BE ASTM A36 AND GALVANIZED.

THE EXISTING POST SHALL BE REMOVED AND NEW POST BE MOUNTED ON THE TOP OF THE STRUCTURE AS SHOWN AND AT THE SAME SPACING.

6" X 8" X 1'-10" TIMBER BLOCK

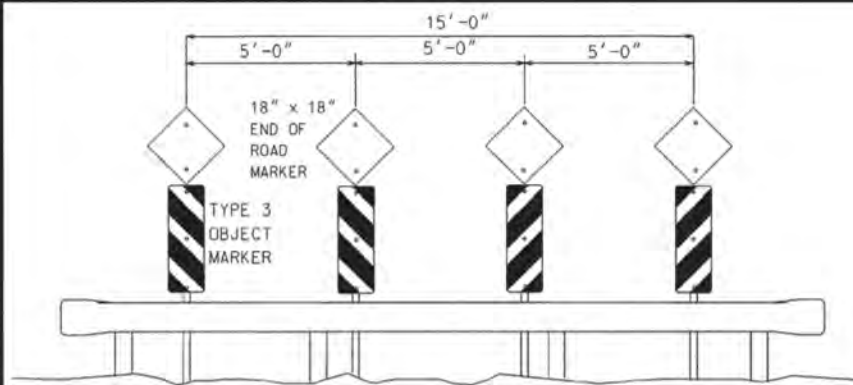
1 1/2" HOLES FOR 1" H.S. BOLTS. ASTM A449 W/HEX NUT AND 2 WASHERS

ALL 5/8" BOLTS SHALL BE ASTM A307.

CURB HEIGHT MAY VARY, ADJUST W6 x 20 POST LENGTH AS NEEDED TO MEET 2'-8" DIMENSION.

THIS DETAIL WAS DEVELOPED AND APPROVED FOR USE UNDER NCHRP REPORT 350. AS PER LADOT'S MASH IMPLEMENTATION POLICY, ITS CONTINUED USE IS ALLOWED WHILE A MASH ALTERNATIVE IS DEVELOPED OR EVALUATED.

SHEET NUMBER		PARISH		CONTROL SECTION		STATE PROJECT	
P. FOSSIER	C. GAUDRY	J. DOUCET	P. FOSSIER	K. BRAUNER			
DESIGN	CHECK	DETAIL	CHECK	REVIEW	SERIES		
APPROVED BY CHIEF ENGINEER:							
DATE: 5/13/2022							
BRIDGE RAIL REHABILITATION WASKEY BRIDGES							
STANDARD PLAN							
DOTD LOUISIANA DEPARTMENT OF TRANSPORTATION & DEVELOPMENT							
BRIDGE AND STRUCTURAL DESIGN							

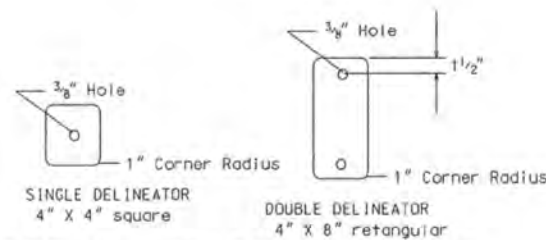


END-OF-ROADWAY INSTALLATION

(TYPE A - WITH GUARD RAIL, TYPE D - WITHOUT GUARD RAIL)

For End of Road installation Object Marker stripes shall slope downward toward the center.

Guardrail to be installed in accordance with guardrail Standard Plans. Typical installation requires 25 ft. of rail with flared end sections.



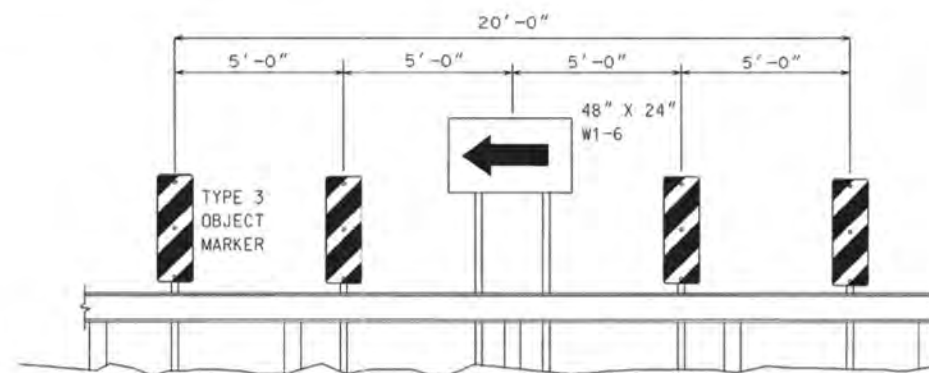
DETAIL OF DELINEATORS

Colors shall be red, white, or yellow. The sheeting shall be in accordance with DOTD Standard Specification.

For alternate Delineator/Flexible Post systems see the DOTD Approved Materials List. Alternates shall have an equivalent area of sheeting and shall not be less than 3 in. wide.

The mounting height shall be the same as for Milepost Markers.

Post penetration in ground shall be a minimum of 2 ft.



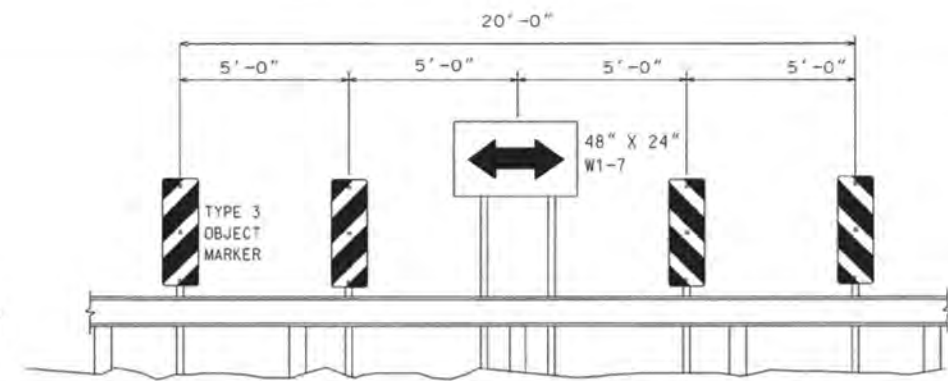
TURN INSTALLATION

DEAD END ROAD INSTALLATION

(TYPE B - WITH GUARD RAIL, TYPE C - WITHOUT GUARD RAIL)

For Turn installations Object Marker stripes shall slope downward toward the direction of travel.

Guard rail to be installed in accordance with guardrail Standard Plans. Typical installation requires 25 ft. of rail with flared end sections.



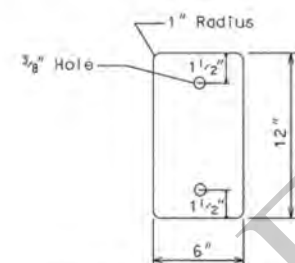
T-INTERSECTION INSTALLATION

DEAD END ROAD INSTALLATION

(TYPE B - WITH GUARD RAIL, TYPE C - WITHOUT GUARD RAIL)

For T-intersection installations Object Marker stripes shall slope away from center. Guardrail to be installed in accordance with guardrail Standard Plans.

Typical installation requires 25 ft. of rail with flared end sections.

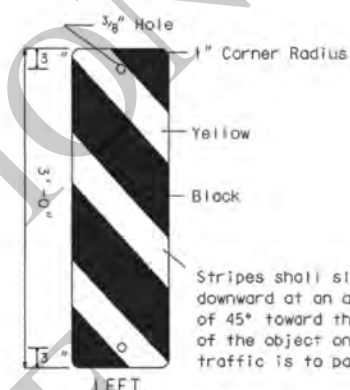


DETAIL OF TYPE 2 OBJECT MARKER

The face shall be yellow. The sheeting shall be in accordance with DOTD Standard Specification. The typical mounting height from the ground line to the bottom of the object marker shall be 36 in.

Post penetration in ground shall be a minimum of 2 ft.

Type 2 Object Markers are typically used in the right-of-way to mark objects for mowing operations.



DETAIL OF TYPE 3 OBJECT MARKER

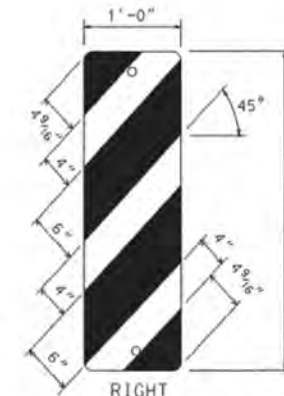
The markings on the Object Markers shall be diagonal, black and yellow stripes. The sheeting shall be in accordance with DOTD Standard Specifications.

Post penetration in ground shall be a minimum of 3 ft.

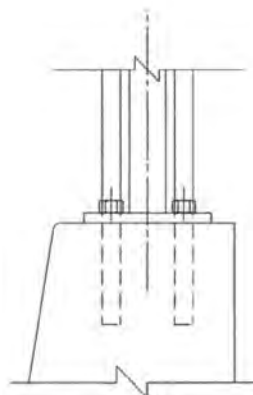
Type 3 Object Markers are typically used to mark objects in the roadway (travel lanes and shoulder) and to mark guard rail installation (see guard rail Standard Plans).

When used for marking objects in the roadway or objects that are 8 ft. or less from the shoulder or curb, the mounting height to the bottom of the object marker should be at least 4 ft. above the surface of the nearest traffic lane.

When used to mark objects more than 8 ft. from the shoulder or curb, the mounting height to the bottom of the object marker should be at least 4 ft. above the ground.

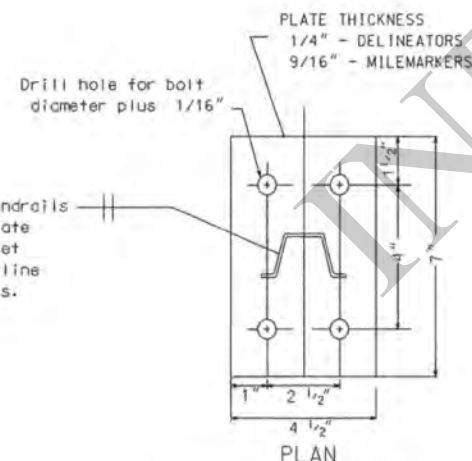


Note: For mile markers on conventional roads. See the details shown on the Special Signing Details sheets-B. This is in accordance with MUTCD signs D10-4 & D10-5 in Figure 2H-4.



SECTION

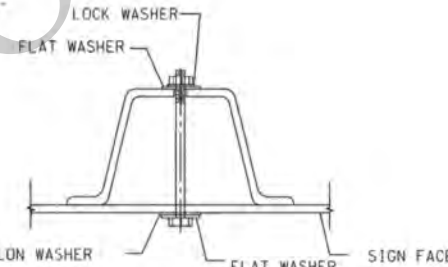
Anchor Bolts
1/4 in. plate - 5/16 in. x 4 in. bolt
3/16 in. plate - 1/2 in. x 5 in. bolt
For bolt anchors see DOTD Approved Materials List.



PLAN

Steel base plate and channel posts shall be galvanized after fabrication.

DETAIL FOR MOUNTING SIGN POST TO CONCRETE BARRIER RAIL



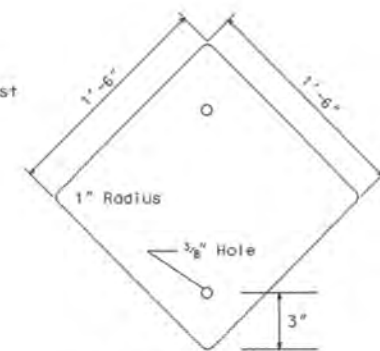
Steel U-channel sign post shall have 3/8 in. dia. holes drilled in channel on 1 in. centers from top of post. Steel tube post (Min. 2.23 lb/ft) may be used in lieu of U-channel posts.
Post Weight: 2.0 lbs/ft - DELINEATORS and TYPE 2 OBJECT MARKERS
2.5 lbs/ft - MILEMARKERS and TYPE 3 OBJECT MARKERS
3.0 lbs/ft - WARNING SIGNS, W1-6, W1-7
Fasteners shall be either bolts or rivets.

Bolts shall be 5/16 in. diameter electroplated steel hex head bolts with one nylon washer, two flat washers, one lock washer, and one vandal resistant hex nut.

Rivets shall be vandal resistant 1/4 in. diameter aluminum blind rivets with smooth, low profile heads on each end.

DETAIL FOR MOUNTING SIGN TO U-CHANNEL POST

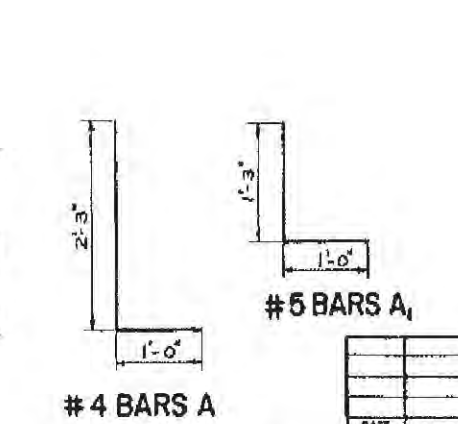
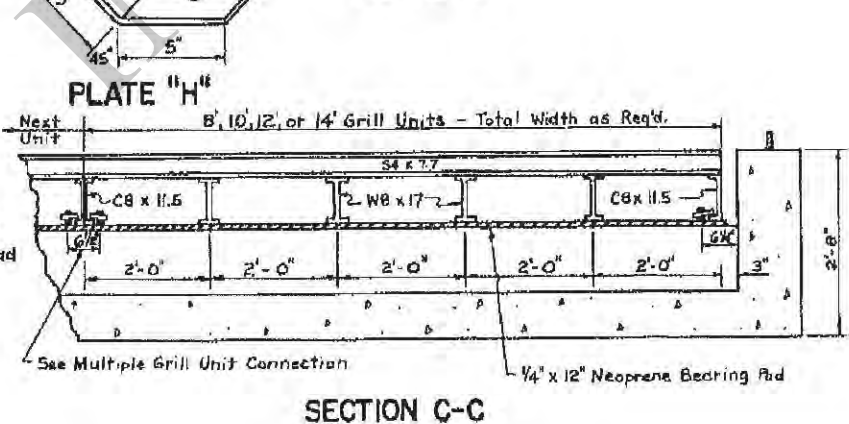
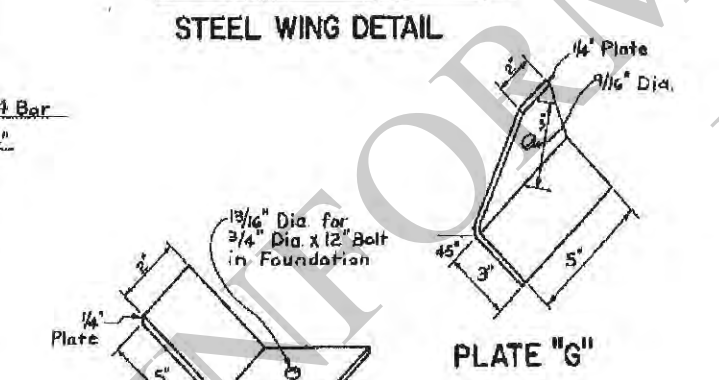
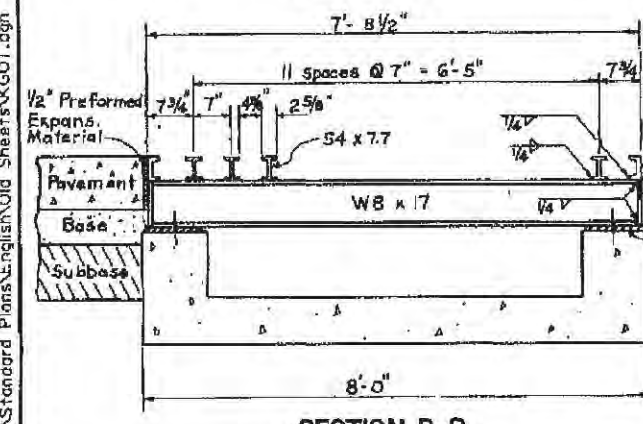
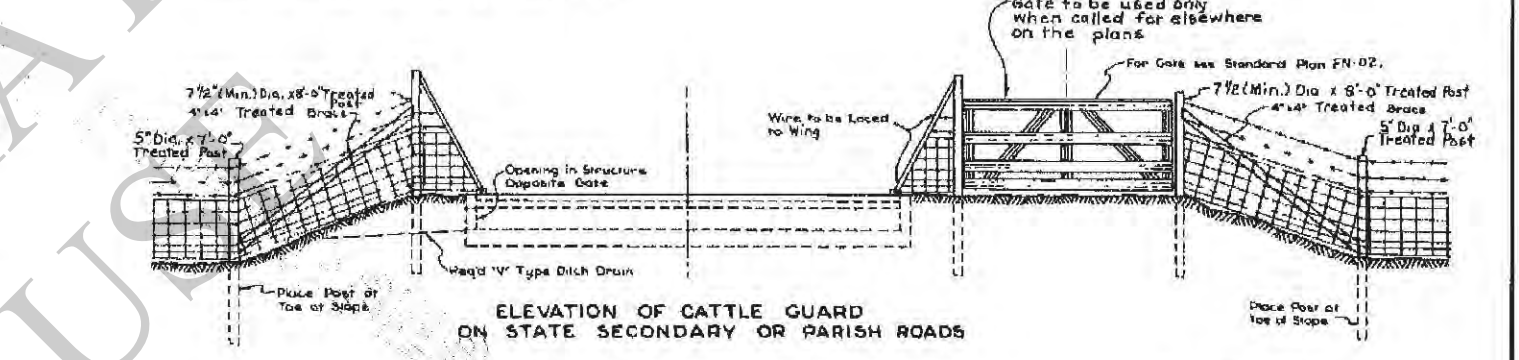
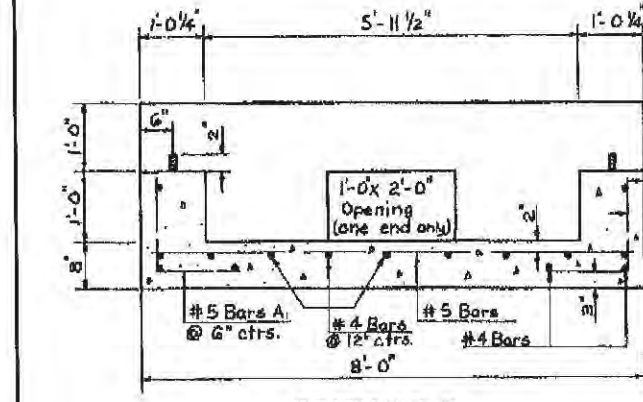
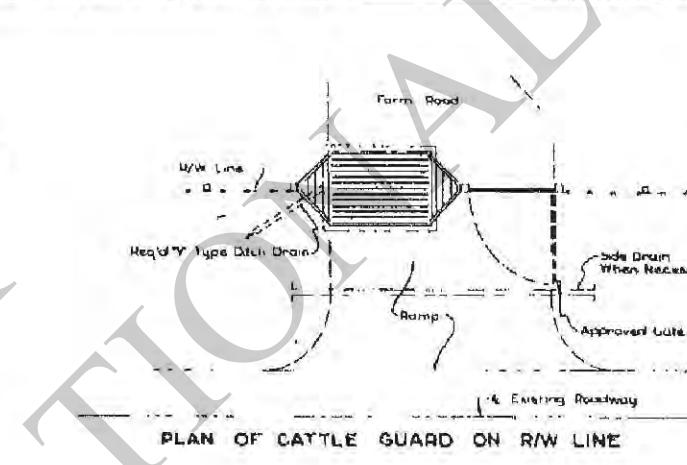
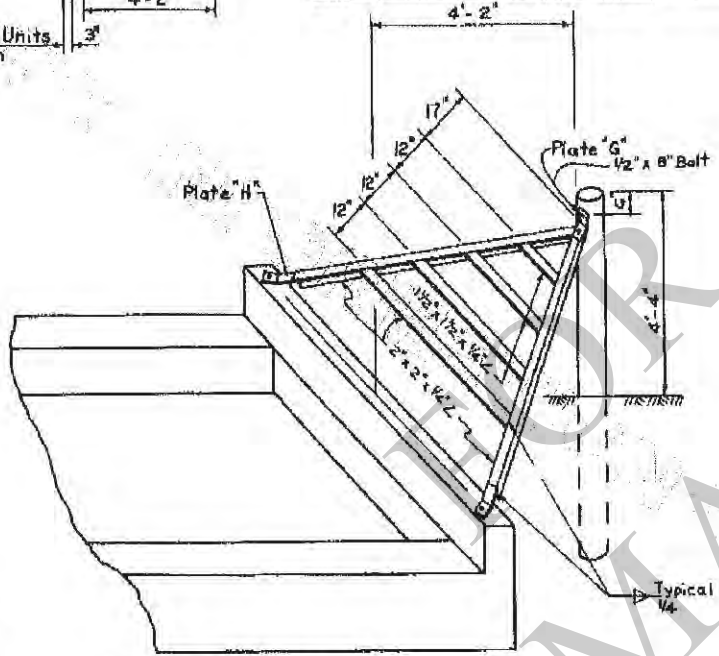
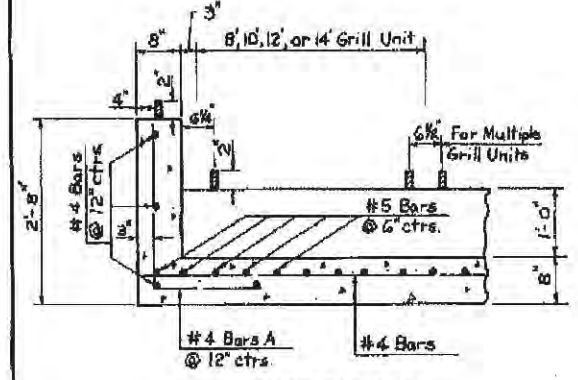
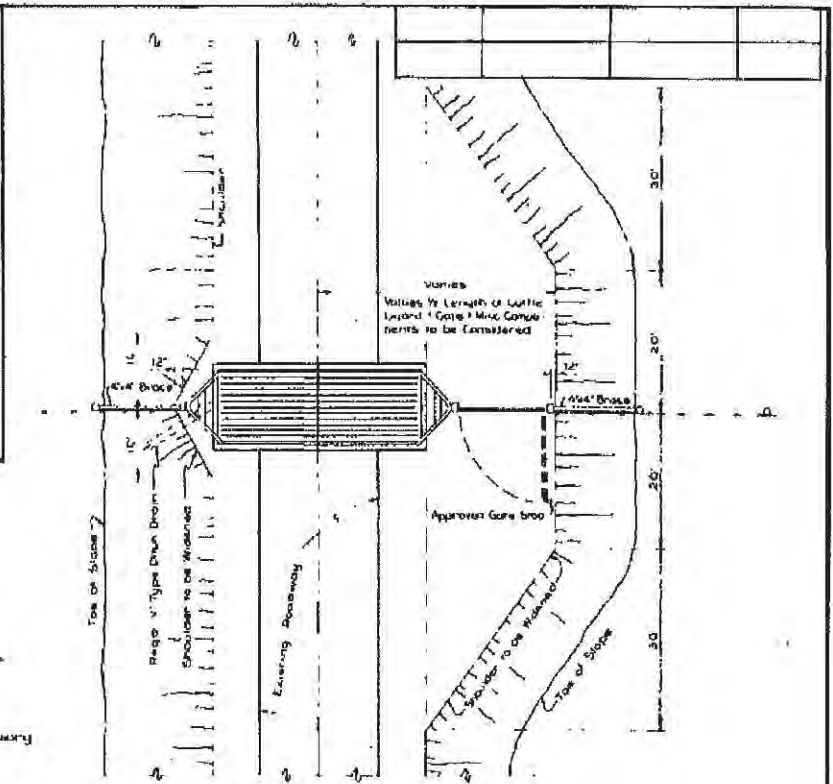
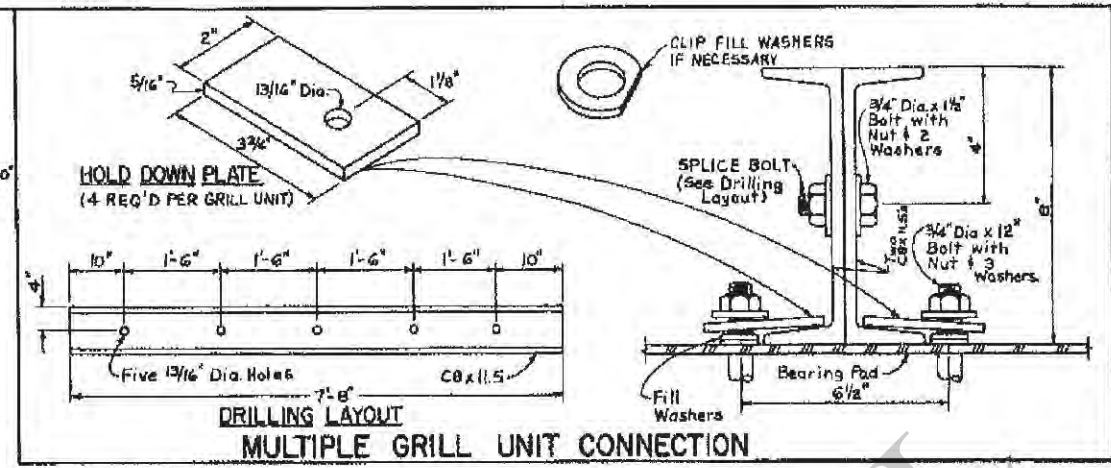
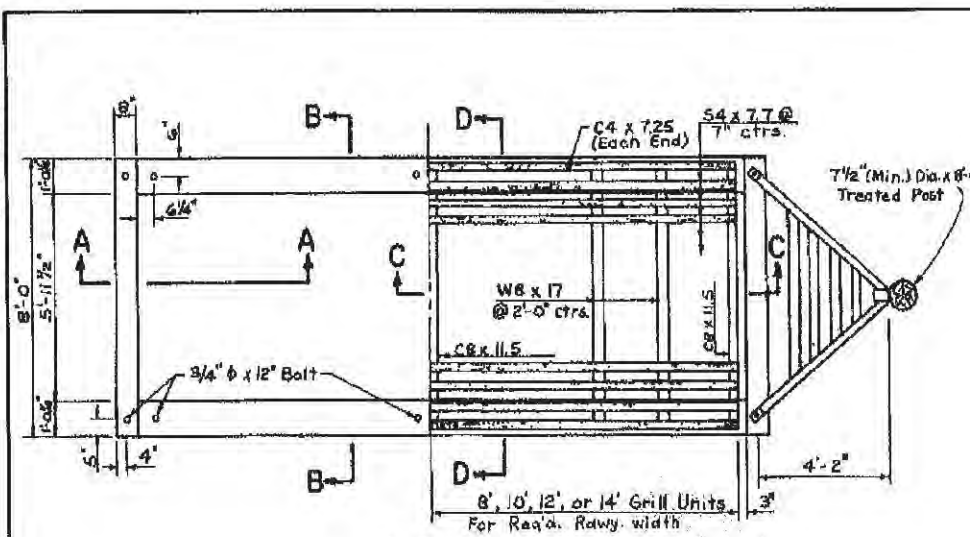
MOUNTING DETAILS



DETAIL OF END OF ROAD MARKER

Colors shall be red. The sheeting shall be in accordance with DOTD Standard Specification. The minimum mounting height from the ground line to the bottom of the marker shall be 5 ft. Post penetration in ground shall be a minimum of 3 ft.

STANDARD PLAN		HS-03	OBJECT MARKERS AND DEAD END ROAD INSTALLATION			DATE		REVISION DESCRIPTION		BY		DESIGNED J. COLVIN CHECKED P. ALLAIN		PARISH	SHEET NUMBER
						APPROVED BY CHIEF ENGINEER,		DATE: 4-7-2014		DATE: 02/13/2013		DETAILED M.D. ORDOGNE CHECKED J. COLVIN		FEDERAL PROJECT	
		TRAFFIC ENGINEERING													



GENERAL NOTES:

Concrete shall be Class "A".

All structural steel shall conform to ASTM A-36.

Painting of Grill Units and Wings shall be an Organic Zinc Primer and Topcoat System according to Std. Spec. Section 811 and related Supplemental Specifications.

Welding shall conform to the D.O.T.D. Std. Specifications and the D.O.T.D. Welding Procedures Manual.

Standard Plan No.	KG-01	SHEET	1 of 1
CATTLE GUARD			
HS20-44(MS-18) LOADING			
GATED Oct 19 1981			
STATE OF LOUISIANA			
DEPARTMENT OF TRANSPORTATION & DEVELOPMENT			
DESIGNED	CDJ	DETAILED	JCM
CHECKED	JCM	CHECKED	CDJ
DATE		DESCRIPTION	
APPROVED	Demetrius L. White	DATE	Oct 19 1981

* Oleander will be limited to areas South of I-10 (from Texas State Line to Baton Rouge) and South of I-12 (from Baton Rouge to Slidell).

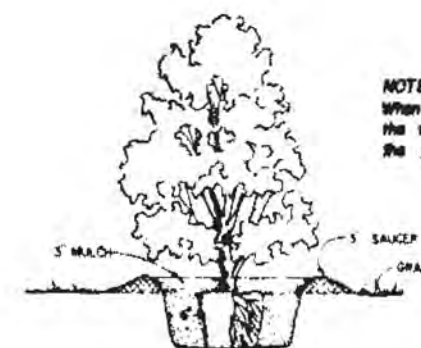
STATE PROJECT	PANEL	SHEET NO.

PLANT MATERIAL

Botanical Name	Common Name & Spacing	Size
Cortaderia argentea	Pampas grass (4' o.c.)	3'-4'
Jasminum primulinum	Primrose jasmine (4' o.c.)	24"-30"
Ligustrum japonica	Wax leaf ligustrum (4' o.c.)	24"-30"
Viburnum odoratissimum	Sweet viburnum (4' o.c.)	24"-30"
Nerium oleander	Oleander (4' o.c.)	3'-4'
Ficus sellowiana	Pineapple guava (4' o.c.)	24"-30"
Pyracantha spp.	Firethorn (4' o.c.)	3'-4'

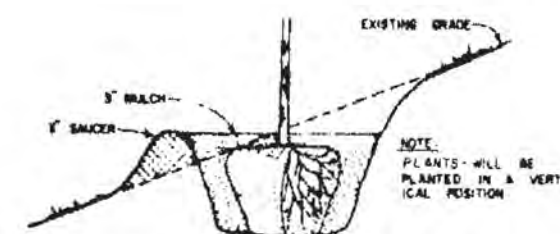
GENERAL NOTE:

1. All shrubbery to be planted a minimum of 6' from barrier. Barrier location should normally be 2' behind shoulder or travel way as directed by the Engineer.
2. Typical Shrubby locations shown are intended to serve as a guide only. Shrubby required shall be indicated on the plans or summary sheet or at locations directed by the Engineer. Payment shall be designated by the appropriate landscape pay item.
3. See Project Specifications for planting and acceptance requirements.



NOTE:
When mulching rows or groups of shrubs, the mulch will run continuously along the perimeter of the planting.

SHRUB PLANTING DETAIL



NOTE:
PLANTS WILL BE PLANTED IN A VERTICAL POSITION

PLANTING ON SLOPES

TYPICAL PLANTING
FOR
DEAD END ROAD INSTALLATION

STANDARD PLAN NO. LS-01		PAGE 1 OF 1
TYPICAL LANDSCAPING LAYOUT FOR USE WITH DEAD END ROAD INSTALLATIONS		
DATED 4/28/28		
STATE OF LOUISIANA DEPARTMENT OF TRANSPORTATION & DEVELOPMENT OFFICE OF HIGHWAYS		
DESIGNED	DETAILS L.H.	TRACED F.B.
CHECKED	CHECKED S.B.	CHECKED T.W.
APPROVED <i>D. J. White</i> CHIEF ENGINEER		DATE 2/29/28



D _c (FEET)		D _s (FEET)	
MINIMUM	PREFERRED	MINIMUM	PREFERRED
65	100	100	150

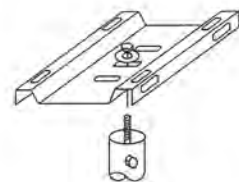
THROUGH ROAD SPEED (M.P.H.)	D _c (FEET)		D _s (FEET)		
	n	V _c V _m ≤ 4000	n	V _c V _m > 4000	V _c / (1.5n - 5)
35	65	200	65	100	100
≥ 55	65	295	150	150	200

V_c = AVERAGE DAILY TRAFFIC ON CROSS ROAD (VEHICLES PER DAY)

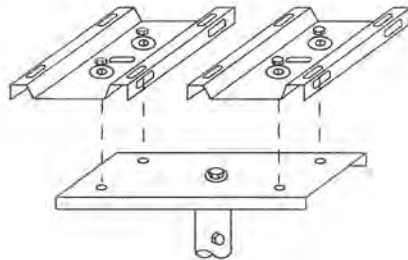
V_m = AVERAGE DAILY TRAFFIC ON THROUGH ROAD (VEHICLES PER DAY)

n = NUMBER OF MAILBOXES AT MAIL STOP

MINIMUM CLEARANCES TO NEAREST MAILBOX IN MAIL STOPS AT INTERSECTIONS

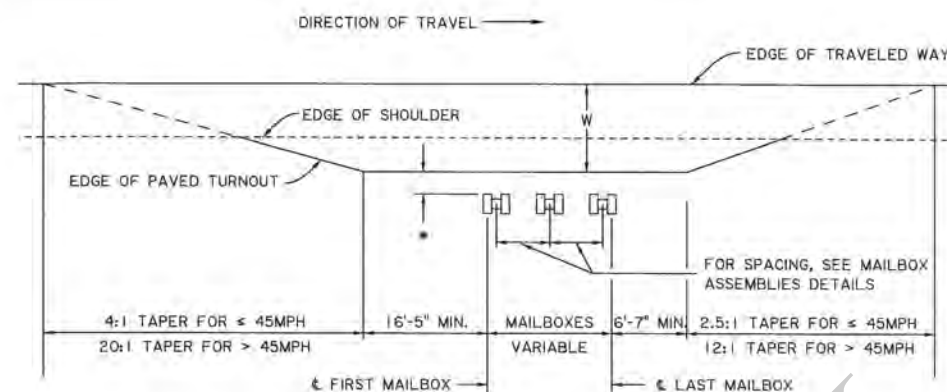


SINGLE MAILBOX MOUNT



DOUBLE MAILBOX MOUNT

SINGLE AND DOUBLE MAILBOX MOUNTS
SERIES C



W = FOR SUGGESTED WIDTHS, SEE TABLE BELOW.
MAILBOXES = A MINIMUM DESIGN FOR ROADS CARRYING LOW-SPEED TRAFFIC AND FOR LOCAL AND COLLECTOR ROADS.
* FOR MAILBOX FACE OFFSET, SEE TABLE BELOW, 0' - 12'.

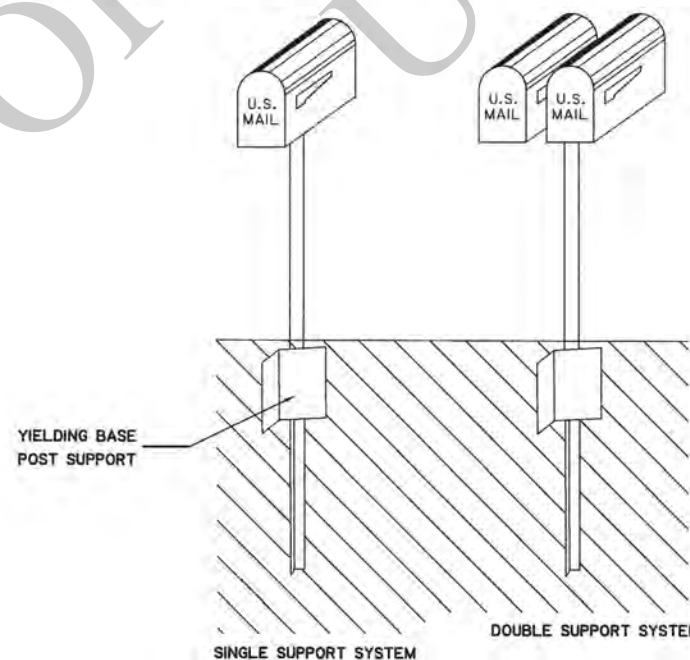
DETAIL OF MAILBOX TURNOUT

* SUGGESTED GUIDELINES FOR LATERAL PLACEMENT OF MAILBOXES

HIGHWAY TYPE AND ADT (VPD)	WIDTH OF ALL-WEATHER SURFACE TURNOUT OR AVAILABLE SHOULDER AT MAILBOX ^a (FT)		DISTANCE ROADSIDE FACE OF MAILBOX IS TO BE OFFSET BEHIND EDGE OF TURNOUT OR USABLE SHOULDER (IN)	
	PREFERRED	MINIMUM	PREFERRED	MINIMUM
RURAL HIGHWAY OVER 10,000	12	8	6 to 8	0
RURAL HIGHWAY 1,500 TO 10,000	12	8		
RURAL HIGHWAY 400 TO 1,500	10	8		
RURAL ROAD UNDER 400	8	6 ^b		6 ^c
RESIDENTIAL STREET WITHOUT CURB OR ALL-WEATHER SHOULDER	6	0		
CURBED RESIDENTIAL STREET OR URBAN AND SUBURBAN AREAS	NOT APPLICABLE		8 to 12 ^d	6 ^d

NOTES: ADT = AVERAGE DAILY TRAFFIC
VPD = VEHICLES PER DAY

- IF INCREASE ACCESS IS NEEDED, THE FOLLOWING MAY BE CONSIDERED IN CONJUNCTION WITH THE LOCAL POSTMASTER:
 - PROVIDE A LEVEL CLEAR SPACE 30 IN. BY 48 IN. CENTERED ON THE BOX FOR EITHER SIDE OR FORWARD APPROACH.
 - PROVIDE AN ACCESSIBLE PASSAGE TO AND FROM THE MAILBOX AND PROJECT INTO A CIRCULATION ROUTE—NO MORE THAN 4 IN. IF BETWEEN 28 IN. AND 60 IN.—SO THAT THE MAILBOX DOES NOT BECOME A PROTRUDING OBJECT FOR PEDESTRIANS WITH IMPAIRED VISION.
- PROVIDE AN ACCESSIBLE PASSAGE TO AND FROM THE MAILBOX. THE MAILBOX PROJECTION INTO A CIRCULATION ROUTE SHALL NOT BE MORE THAN 4 IN., SO THAT THE MAILBOX DOES NOT BECOME A PROTRUDING OBJECT FOR PEDESTRIANS WITH IMPAIRED VISION.
- IF A TURNOUT IS PROVIDED, THIS MAY BE REDUCED TO ZERO.
- BEHIND TRAFFIC-FACE OF CURB.



EXAMPLES OF SINGLE AND DOUBLE MAILBOX INSTALLATIONS
SERIES C

NOTES:

NO MAILBOX WILL BE PERMITTED WHERE ACCESS IS OBTAINED FROM THE LANES OF A FREEWAY OR WHERE ACCESS IS OTHERWISE PROHIBITED BY LAW OR REGULATION.

MAILBOXES SHALL BE LOCATED ON THE RIGHT-HAND SIDE OF THE ROADWAY IN THE DIRECTION OF DELIVERY ROUTE EXCEPT ON ONE-WAY STREETS WHERE THEY MAY BE PLACED ON EITHER SIDE. THE BOTTOM OF THE BOX SHALL BE SET AT AN ELEVATION (H) ESTABLISHED BY THE U.S. POSTAL SERVICE, USUALLY BETWEEN 3'4" AND 4'0" ABOVE THE ROADWAY SURFACE. THE ROADSIDE FACE OF THE BOX SHALL BE OFFSET FROM THE EDGE OF THE TRAVELED WAY. SEE THE SUGGESTED GUIDELINES FOR LATERAL PLACEMENT OF MAILBOXES AT LEFT.

ALL MAILBOX INSTALLATIONS MUST CONFORM TO THE REQUIREMENTS OF THE U.S. POSTAL SERVICE.

WHERE FEASIBLE, NEW INSTALLATION SHOULD BE LOCATED ON THE FAR RIGHT SIDE OF AN INTERSECTION WITH A ROAD OR DRIVEWAY ENTRANCE. HOWEVER, CONSIDERATION SHOULD BE GIVEN TO

- MINIMIZING WALKING DISTANCE WITHIN THE ROADWAY FOR THE PATRON.
 - AVAILABLE STOPPING SIGHT DISTANCE IN ADVANCE OF THE MAILBOX SITE, AND
 - POSSIBLE RESTRICTIONS TO CORNER SIGHT DISTANCES AT INTERSECTIONS AND DRIVEWAY ENTRANCES.
- FOR LOCATION OF MAILBOXES AT AN INTERSECTING ROADWAY, SEE DETAIL AT LEFT.

MAILBOXES SHALL BE OF LIGHT SHEET METAL OR PLASTIC CONSTRUCTION MANUFACTURED BY AN APPROVED MANUFACTURER CONFORMING TO THE REQUIREMENTS OF THE U.S. POSTAL SERVICE. MAILBOXES MUST BE FULL-SCALE CRASH TESTED IN ACCORDANCE WITH THE LATEST EDITION OF MASH. NEWSPAPER DELIVERY BOXES SHALL BE OF LIGHT SHEET METAL OR PLASTIC CONSTRUCTION OF MINIMUM DIMENSIONS SUITABLE FOR HOLDING A NEWSPAPER.

MANUFACTURERS WHOSE MAILBOXES HAVE BEEN APPROVED BY THE POSTMASTER GENERAL WILL BE LISTED IN THE POSTAL OPERATION MANUAL (POM) AND PUBLISHED IN THE POSTAL BULLETIN. NO MORE THAN TWO MAILBOXES MAY BE MOUNTED ON A SUPPORT STRUCTURE UNLESS THE SUPPORT STRUCTURE AND MAILBOX ARRANGEMENT HAVE BEEN SHOWN TO BE SAFE BY CRASH TESTING IN ACCORDANCE WITH THE LATEST EDITION OF MASH. HOWEVER, LIGHTWEIGHT NEWSPAPER BOXES MAY BE MOUNTED BELOW THE MAILBOX ON THE SIDE OF THE MAILBOX SUPPORT.

MAILBOX SUPPORTS SHALL NOT BE SET IN CONCRETE UNLESS THE SUPPORT DESIGN HAS BEEN SHOWN TO BE SAFE BY CRASH TESTING IN ACCORDANCE WITH THE LATEST EDITION OF MASH WHEN SO INSTALLED.

POSTS SHALL BE STRONG ENOUGH TO SUPPORT THE BOX, BUT CAPABLE OF BENDING WHEN STRUCK BY AN AUTOMOBILE OR A LIGHT TRUCK. MAXIMUM STRENGTH POSTS ARE EITHER A METAL POST WITH A STRENGTH NO GREATER THAN A 2" DIAMETER STANDARD STRENGTH STEEL PIPE OR A 2"/FT FLANGED CHANNEL OR A 4"x4" WOODEN POST. POSTS ARE ACCEPTABLE MAILBOX SUPPORTS WHEN EMBEDDED NO MORE THAN 24" INTO THE GROUND. A METAL POST SHALL NOT BE FITTED WITH AN ANCHOR PLATE, BUT MAY HAVE AN ANTI-TWIST DEVICE THAT EXTENDS NO MORE THAN 10" BELOW THE GROUND SURFACE.

THE POST-TO-BOX ATTACHMENT SHALL BE OF SUFFICIENT STRENGTH TO PREVENT THE BOX FROM SEPARATING FROM THE POST TOP IF THE INSTALLATION IS STRUCK BY AN AUTOMOBILE OR LIGHT TRUCK.

THE MINIMUM SPACING BETWEEN THE CENTERS OF SUPPORT POSTS SHALL BE THREE-FOURTHS THE HEIGHT OF THE POSTS ABOVE THE GROUND LINE

MAILBOX SUPPORT DESIGNS NOT DETAILED WILL BE ACCEPTABLE IF FULL-SCALE CRASH TESTED IN ACCORDANCE WITH THE LATEST EDITION OF MASH AND IF APPROVED BY THE ENGINEER.

FOR POST-TO-BOX ATTACHMENT DETAILS, SEE SHEET 2 OF 2.

MASH - MANUAL FOR ASSESSING SAFETY HARDWARE.

* NOTE: SUPPORT FRAME AND FOUNDATION SHOWN ARE PROPRIETARY PRODUCTS.

SHEET NUMBER	PARISH	CONTROL SECTION	STATE PROJECT
DESIGN	H. VU	CHECK	D. SMITH
DETAIL	H. VU	CHECK	D. SMITH
REVIEW	H. VU	CHECK	D. SMITH
SERIES #	1	OF 2	

04/04/22

APPROVED BY CHIEF ENGINEER

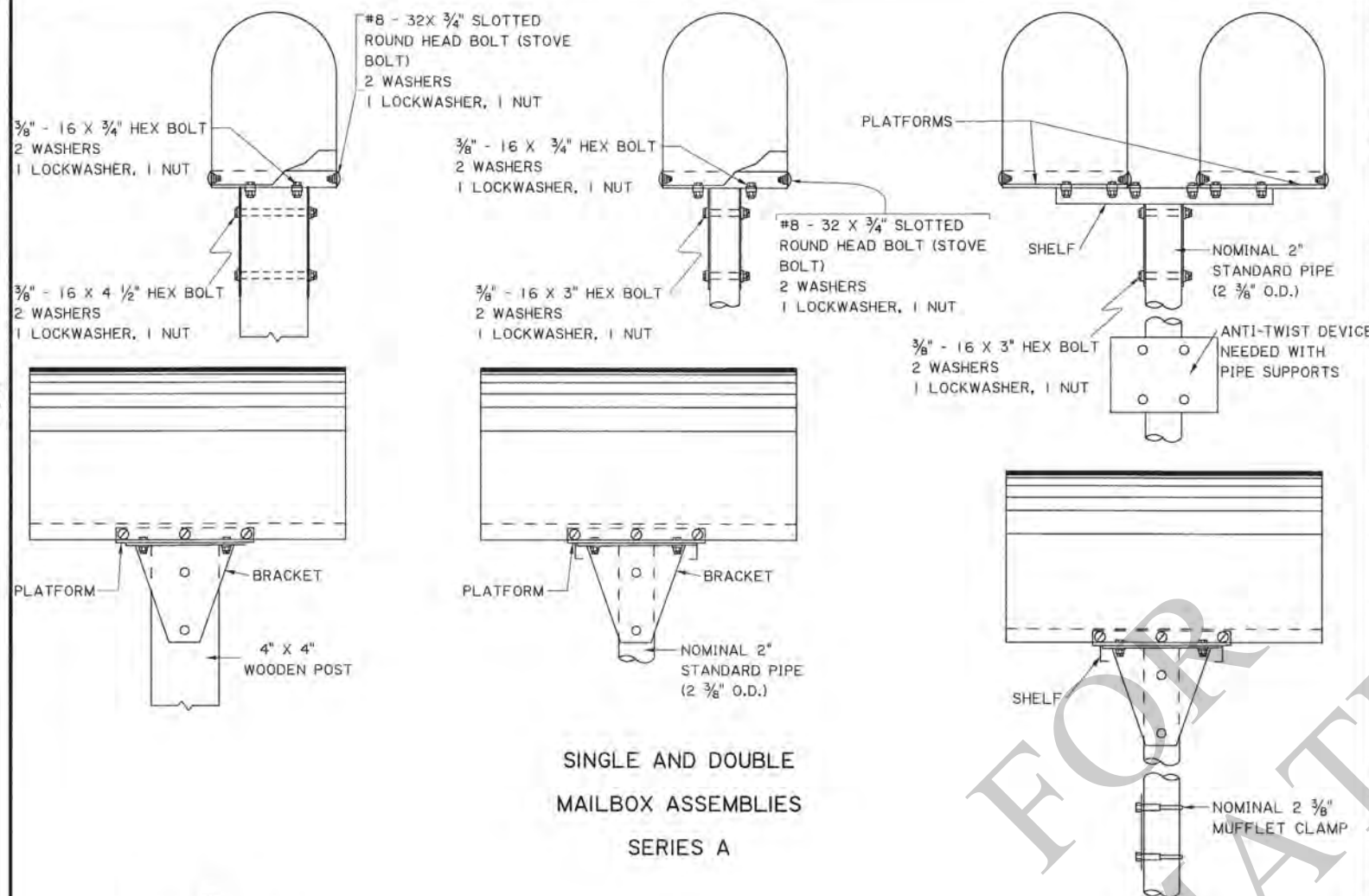
Christopher P. Kelly

DATE: 4/4/2022

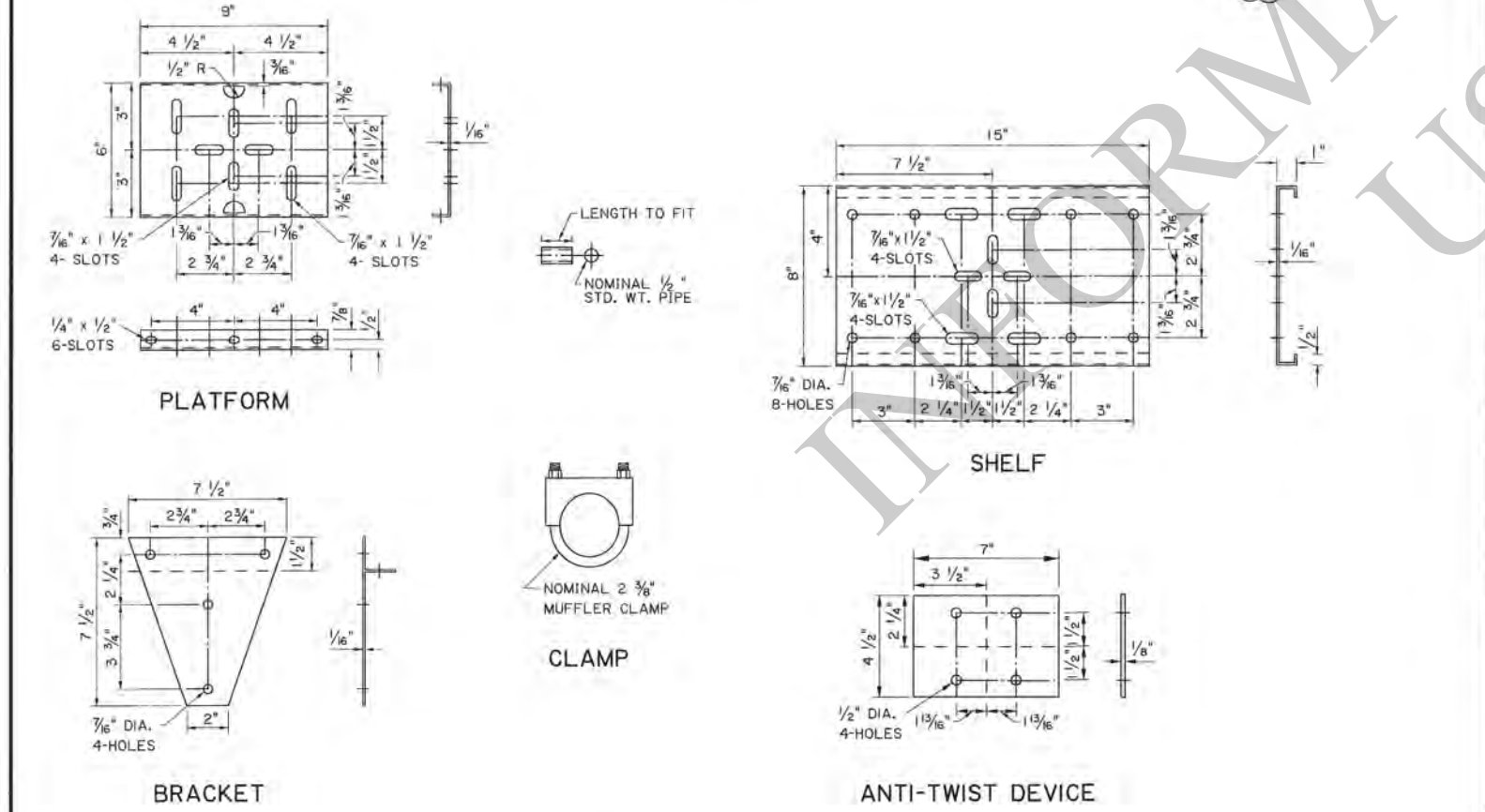
MAILBOX INSTALLATION DETAILS

MB-01

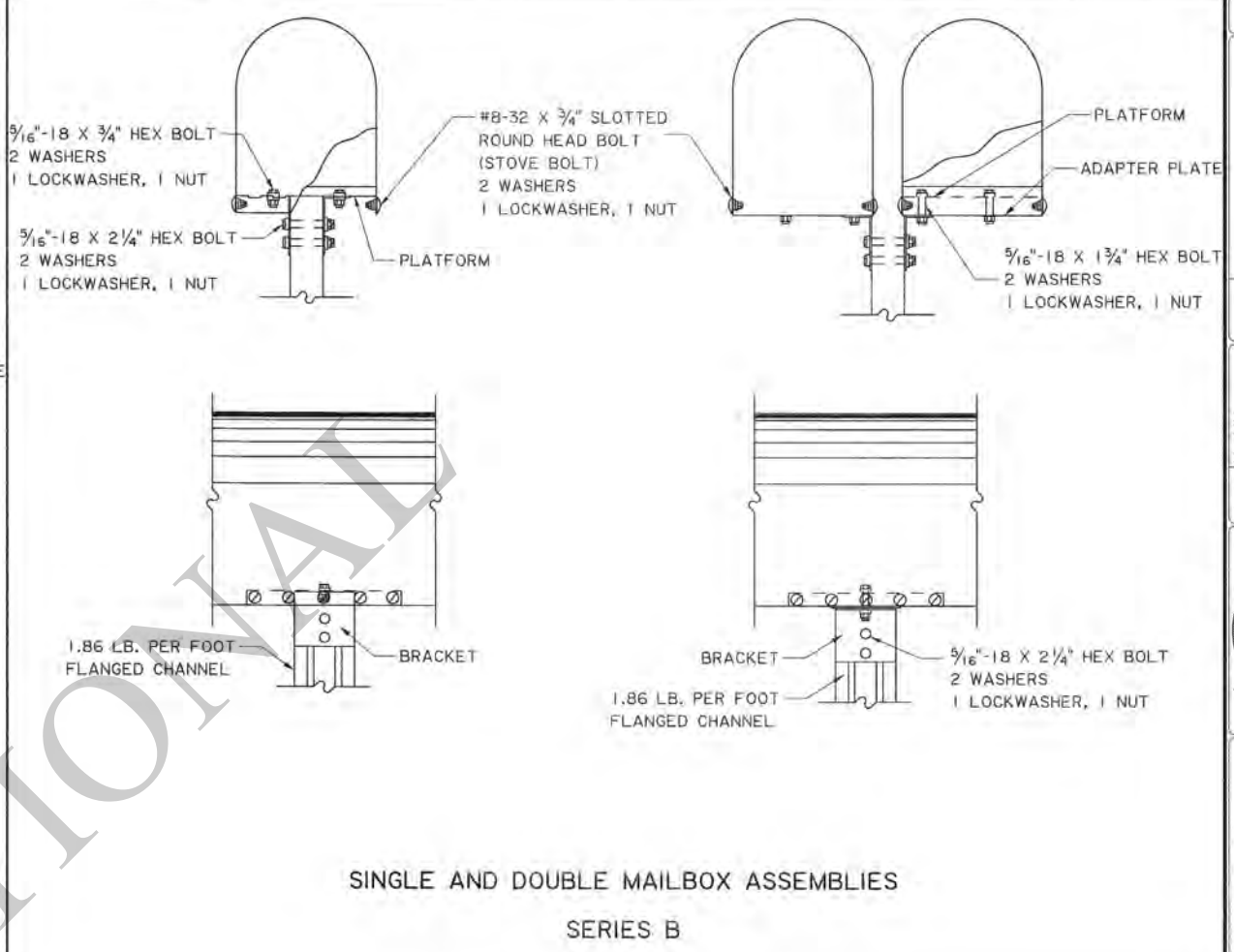
ROAD DESIGN



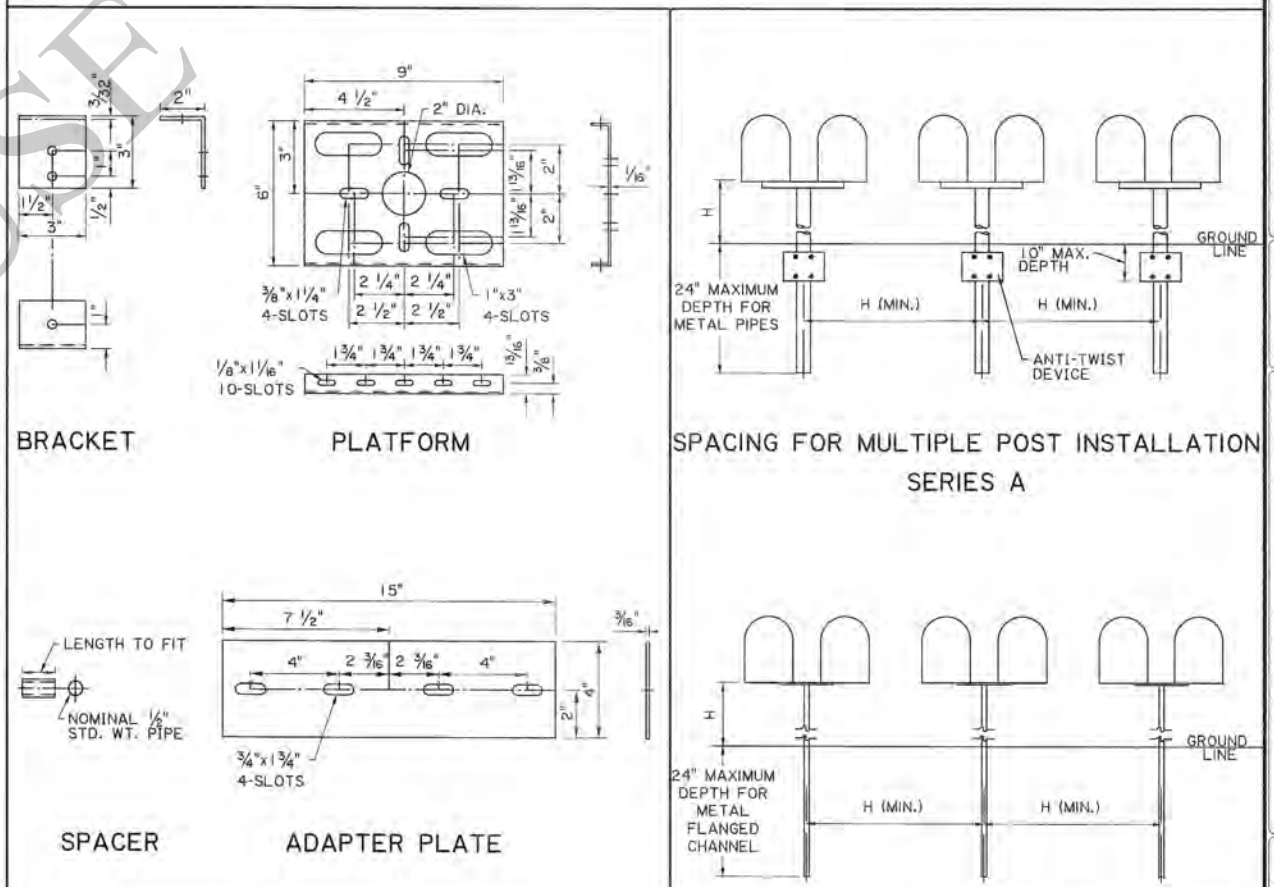
SINGLE AND DOUBLE
MAILBOX ASSEMBLIES
SERIES A



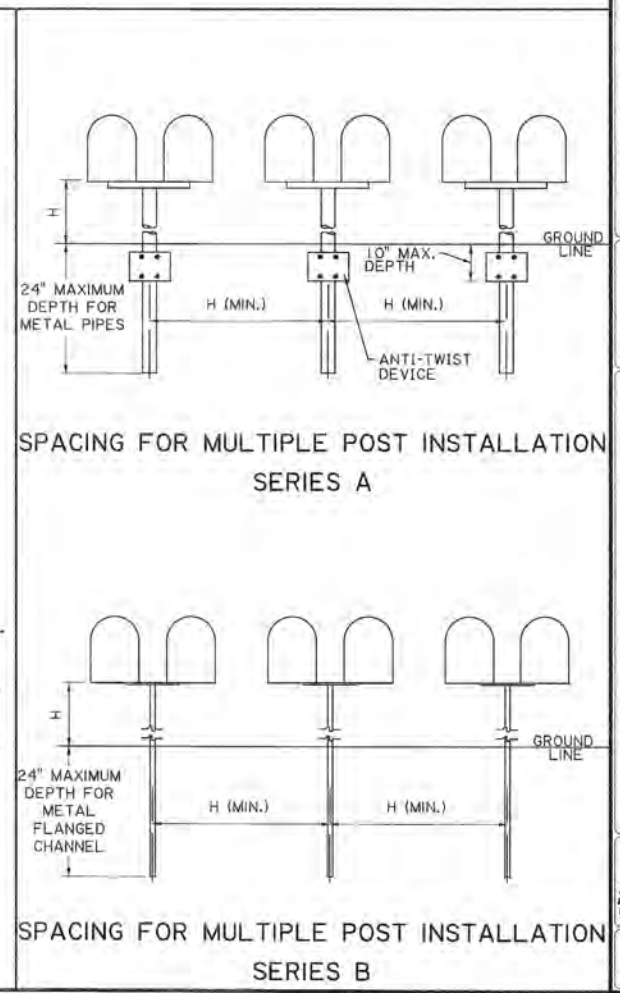
MAILBOX SUPPORT HARDWARE SERIES A



SINGLE AND DOUBLE MAILBOX ASSEMBLIES
SERIES B



MAILBOX SUPPORT HARDWARE
SERIES B



SPACING FOR MULTIPLE POST INSTALLATION
SERIES B

SHEET NUMBER		PARISH		CONTROL SECTION		STATE PROJECT	
DESIGN	H. VU	CHECK	D. SMITH	DETAIL	H. VU	CHECK	D. SMITH
REVIEW		REVIEW		REVIEW		REVIEW	
DATE: 04/04/22				SERIES: 12 OF 2			

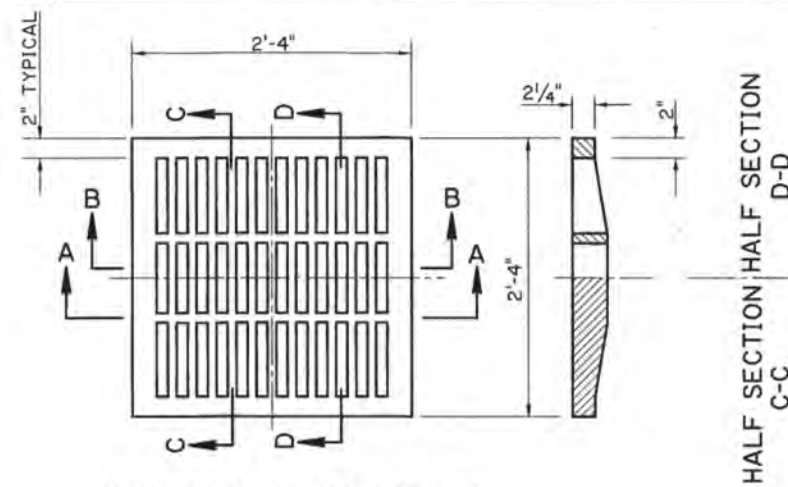
APPROVED BY CHIEF ENGINEER: *[Signature]*

DATE: 4/4/2022

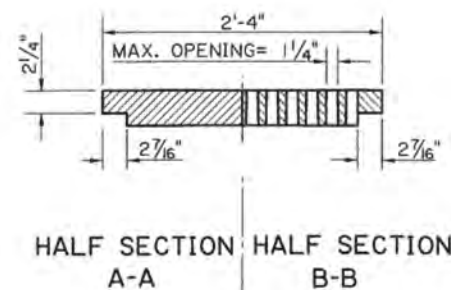
MAILBOX INSTALLATION DETAILS

DOTD
LOUISIANA DEPARTMENT OF TRANSPORTATION & DEVELOPMENT

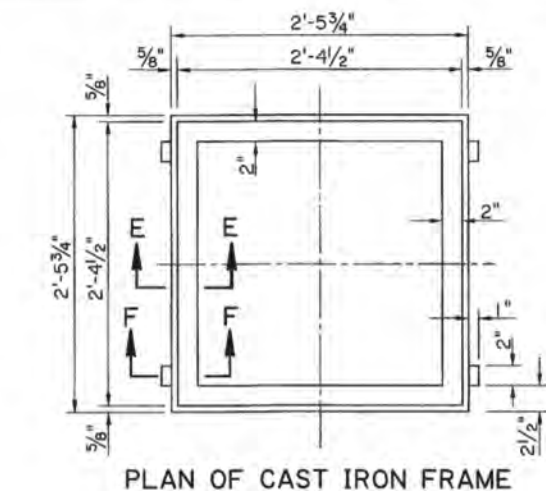
ROAD DESIGN



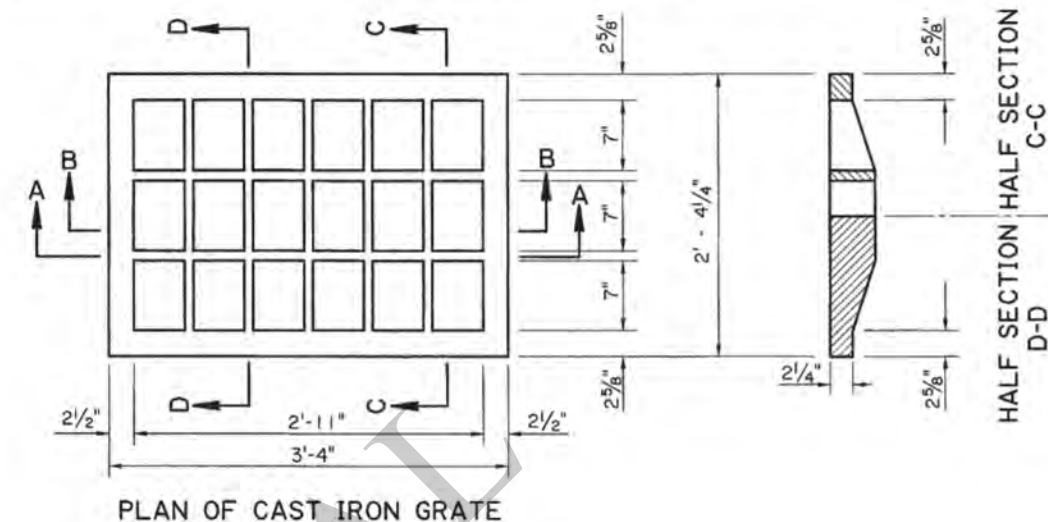
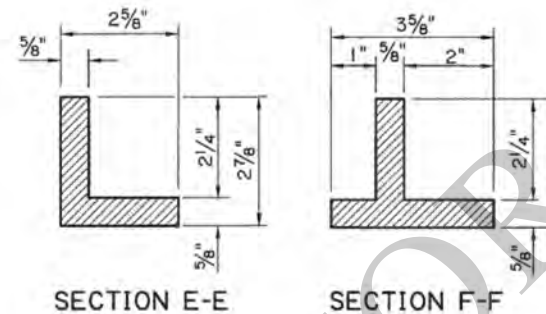
PLAN OF CAST IRON GRATE



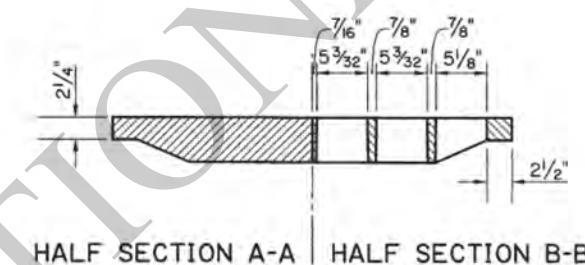
TYPE "A"
CAST IRON GRATE & FRAME
MIN. OPENING = 290 SQ. IN. AREA



PLAN OF CAST IRON FRAME



PLAN OF CAST IRON GRATE



TYPE "B"
CAST IRON GRATE

NOTE: UNLESS OTHERWISE STATED, TYPE "E" FRAME WILL BE USED WITH THIS GRATE.

TYPE "C"

STEEL DRAIN GRATE

- NOTES:
1. GRATES TO BE GALVANIZED AFTER FABRICATION.
 2. UNLESS OTHERWISE STATED, TYPE "E" FRAME IS TO BE USED WITH THESE GRATES. (SEE SHEET 2)
 3. SUPPLIER OF GRATE ALSO IS TO FURNISH PRE-FITTED GRATE FRAME.

WELDED & SEALED DRAIN GRATE

ALL JOINTS FULL DEPTH 1/4" FILLET WELDS WITH SEAL WELDS TOP AND BOTTOM UNLESS NOTED OTHERWISE.

ALL BEARING BARS TO BE SET FLUSH ON GRATE FRAME.

WEIGHT OF DRAIN GRATE = 233 LBS. ± 5%

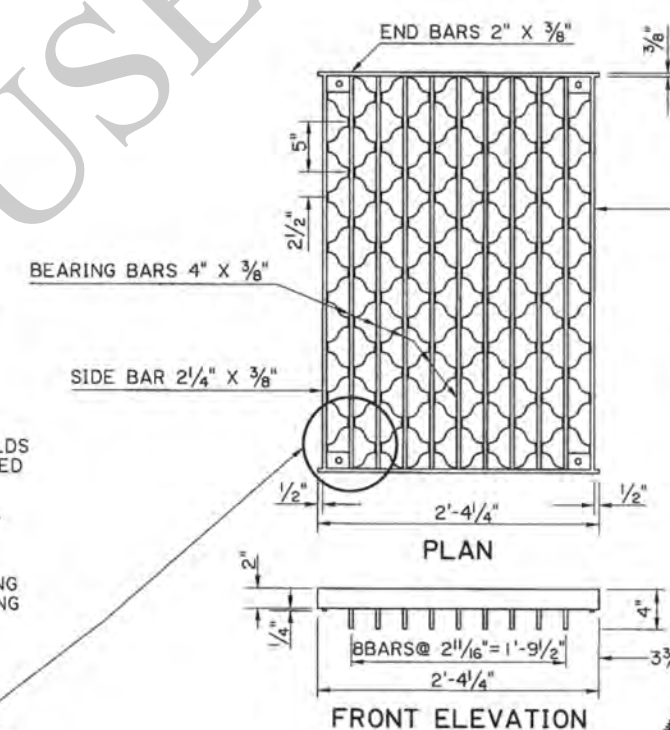
RIVETED RETICULINE DRAIN GRATE (ALTERNATE)

ALL JOINTS FULL DEPTH 1/4" FILLET WELDS WITH SEAL WELDS TOP AND BOTTOM UNLESS NOTED OTHERWISE.

ALL BEARING BARS TO BE SET FLUSH ON GRATE FRAME.

CENTER TO CENTER OF BEARING BARS EQUAL 2 5/16" PLUS BEARING BAR THICKNESS.

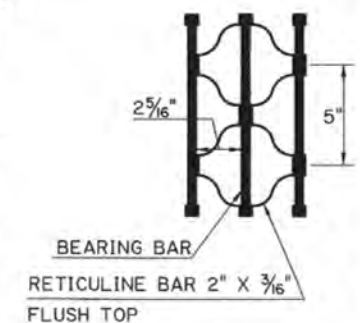
WEIGHT OF DRAIN GRATE = 266 LBS. ± 5%



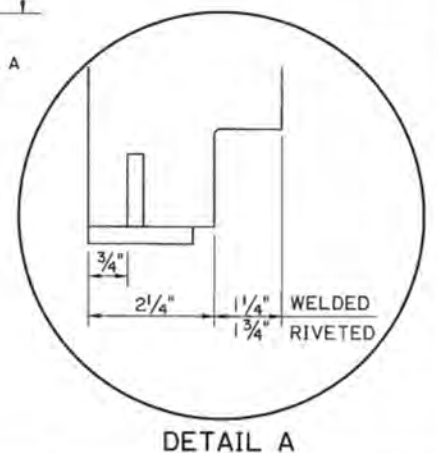
PLAN

FRONT ELEVATION

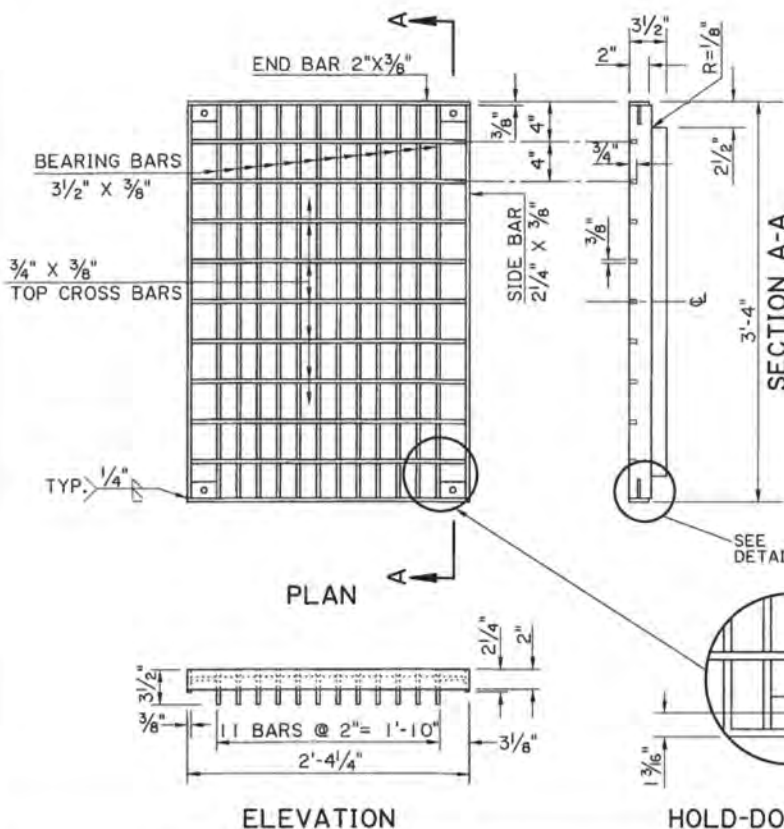
SIDE ELEVATION



DRAIN GRATE DETAIL (ALTERNATE)



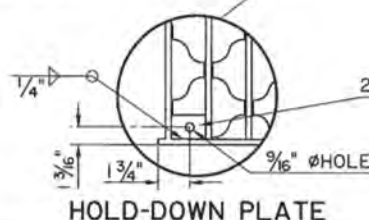
DETAIL A



PLAN

ELEVATION

HOLD-DOWN PLATE

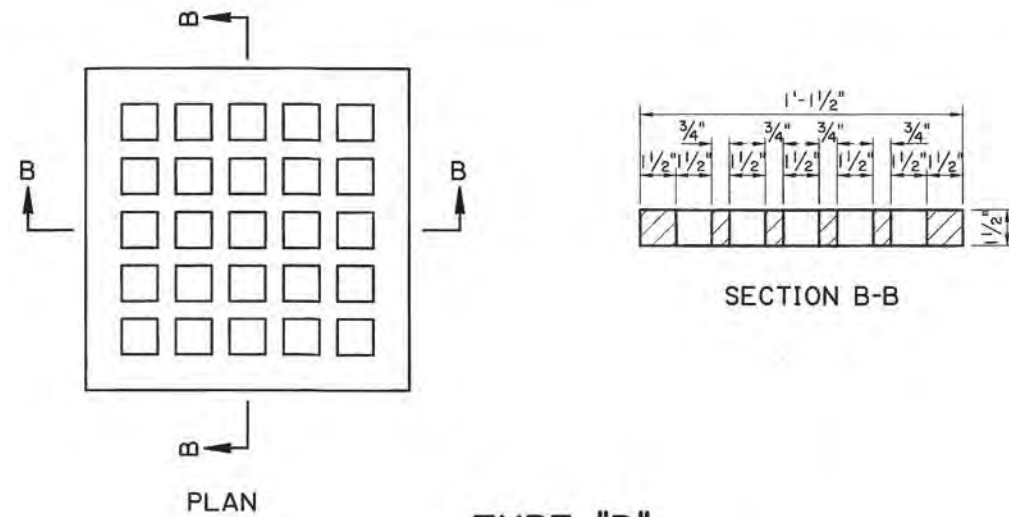


HOLD-DOWN PLATE



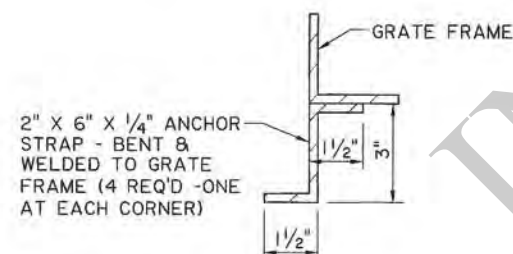
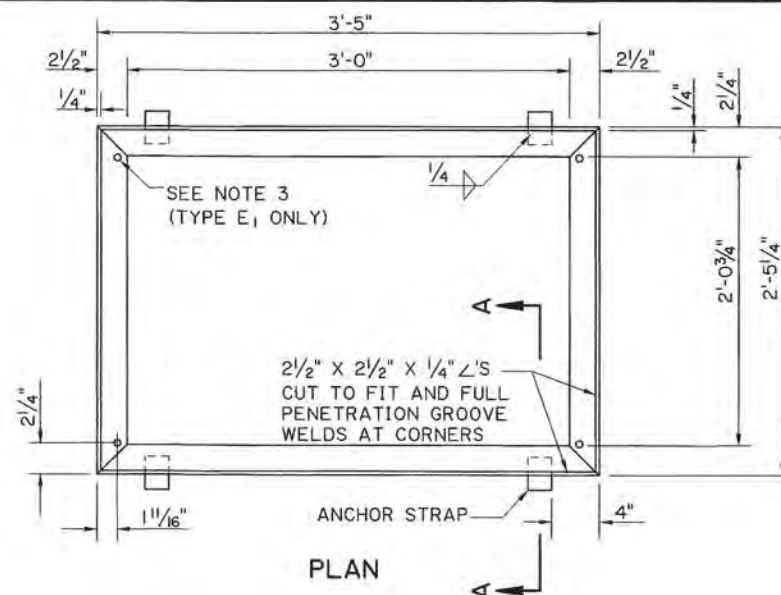
SHEET NUMBER	1 OF 6
PARISH	AMA
CONTROL SECTION	AMA
STATE PROJECT	9/01/17
DATE	5/25/18
REVISION DESCRIPTION	
APPROVED BY	Chief Engineer
DATE	
DETAILS OF GRATES, GRATE FRAMES AND COVERS FOR CATCH BASINS AND MANHOLES	
PLAN	MC-01
HYDRAULICS SECT.	





TYPE "D"

CAST IRON GRATE
WEIGHT OF CASTING = 49 LBS

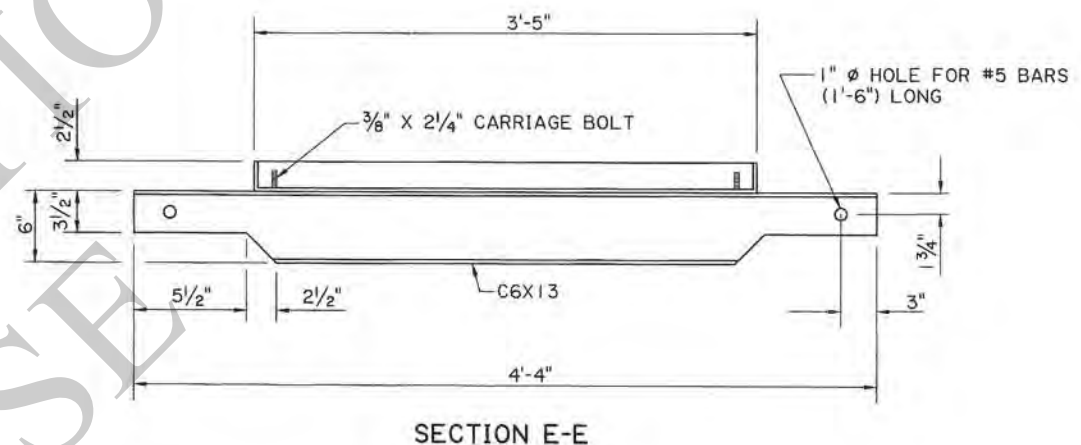
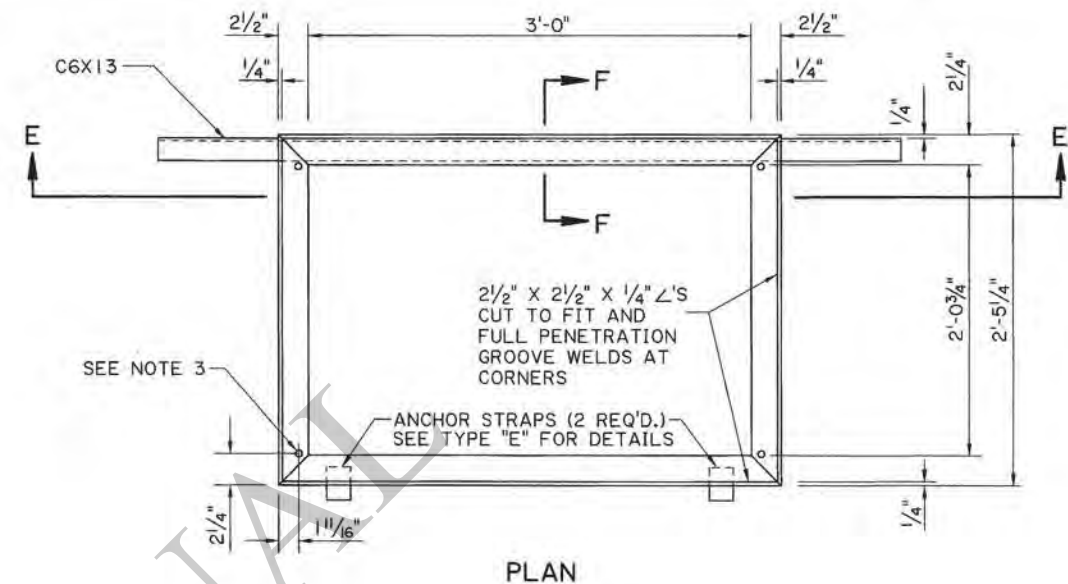


SECTION A-A

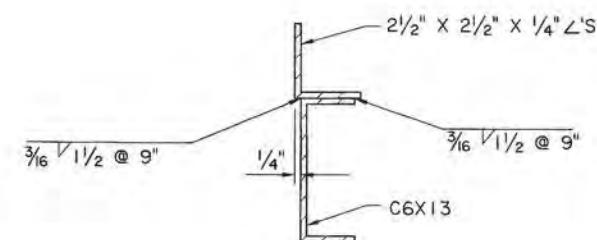
TYPE "E" AND "E1"

STEEL GRATE FRAME

- NOTES:
1. GRATE FRAME TO BE GALVANIZED AFTER FABRICATION
 2. WEIGHT OF GRATE FRAME = 52 LBS
 3. SQUARE PUNCH HOLE PRIOR TO GALVANIZING. ADD A $\frac{3}{8}$ ϕ X 2 1/4" LONG -16 UNC ROUND HEAD SQUARE NECK CARRIAGE BOLT WITH JAM NUT, HEX HEAD NUT, AND FLAT WASHER (ALL STAINLESS STEEL) AFTER FRAME IS GALVANIZED.



SECTION E-E

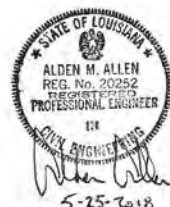


SECTION F-F

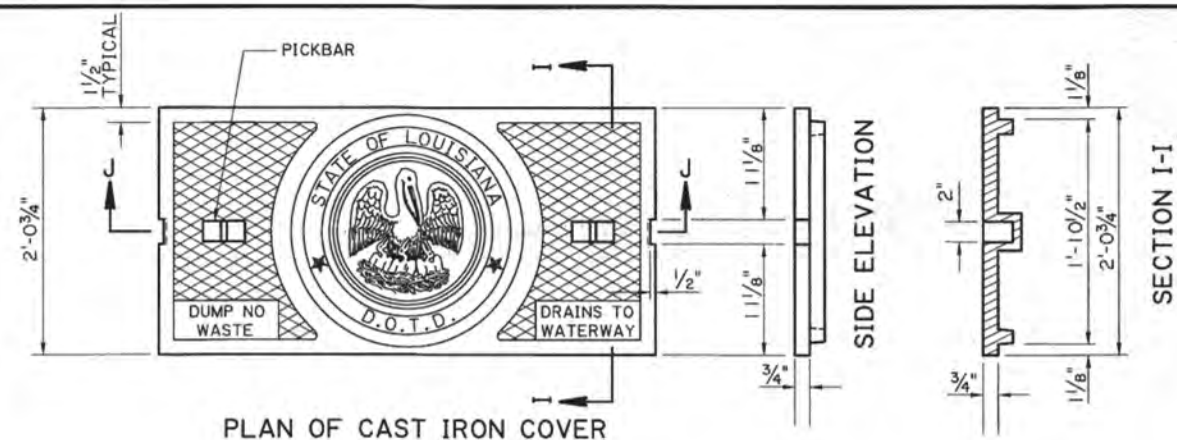
TYPE "F"

STEEL GRATE FRAME

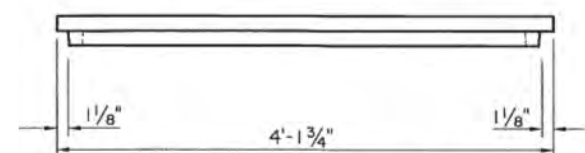
- NOTES:
1. GRATE FRAME TO BE GALVANIZED AFTER FABRICATION
 2. WEIGHT OF GRATE FRAME = 52 LBS $\pm$ 5%
 3. SQUARE PUNCH HOLE PRIOR TO GALVANIZING. ADD A $\frac{3}{8}$ ϕ X 2 1/4" LONG -16 UNC ROUND HEAD SQUARE NECK CARRIAGE BOLT WITH JAM NUT, HEX HEAD NUT, AND FLAT WASHER (ALL STAINLESS STEEL) AFTER FRAME IS GALVANIZED.



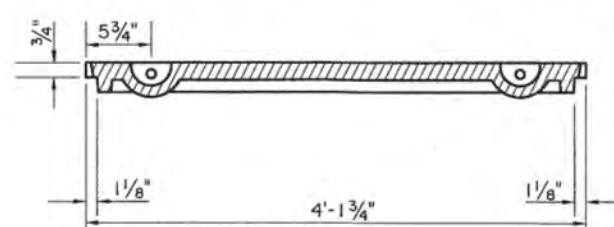
SHEET NUMBER	1
DESIGNED	AMA
CHECKED	AMA
PARISH	
CONTROL SECTION	
STATE	
PROJECT	
DATE	5/25/18
BY	Cheryl P. Smith
REVISION DESCRIPTION	
APPROVED BY	
CHIEF ENGINEER	
DETAILS OF GRATES, GRATE FRAMES AND COVERS FOR CATCH BASINS AND MANHOLES	
STANDARD PLAN	MC-01
DOTD	
HYDRAULICS SECT.	



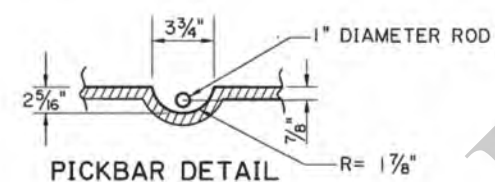
PLAN OF CAST IRON COVER



FRONT ELEVATION OF CAST IRON COVER



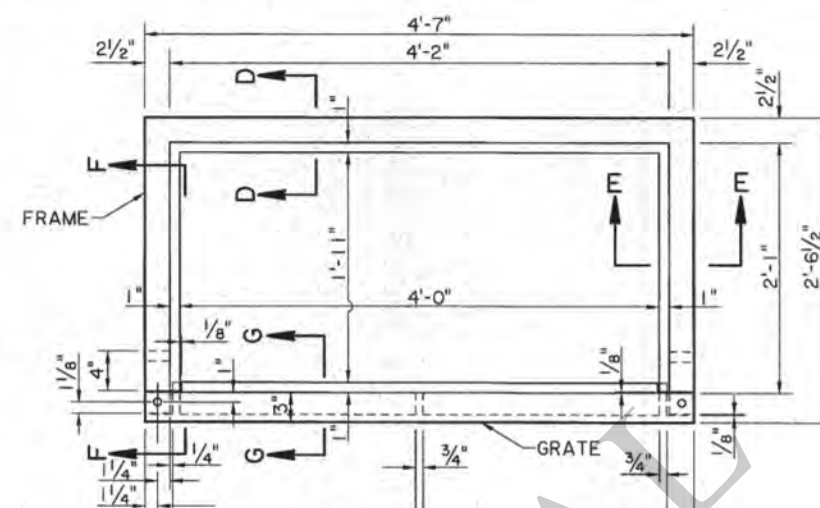
SECTION J-J



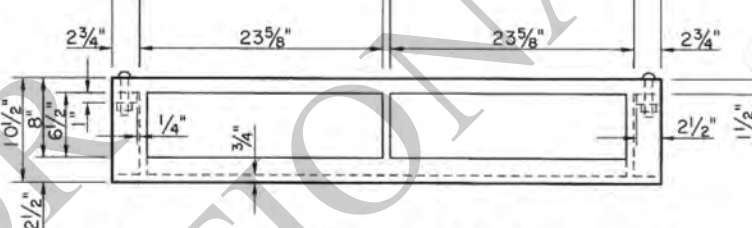
PICKBAR DETAIL

TYPE "H" AND "H₁"

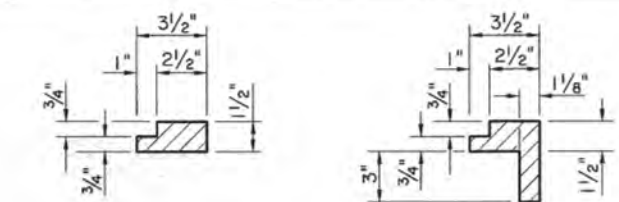
CAST IRON COVER, GRATE AND FRAME



PLAN OF CAST IRON GRATE AND FRAME

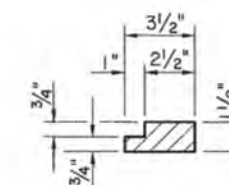


FRONT ELEVATION OF CAST IRON GRATE

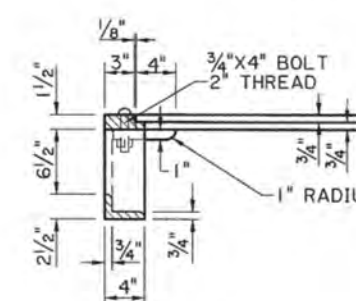


FOR CATCH BASIN "H" FOR PAVED GUTTER "H₁"

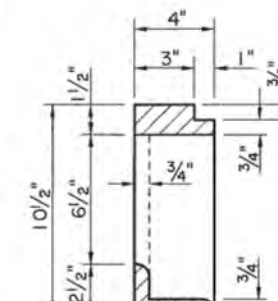
SECTION D-D



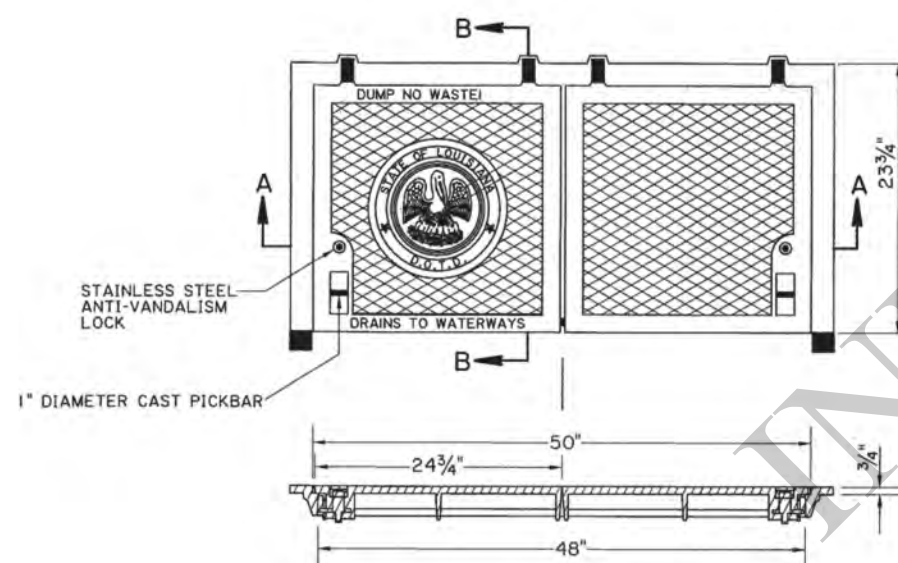
SECTION E-E



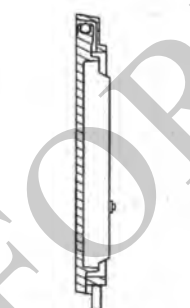
SECTION F-F



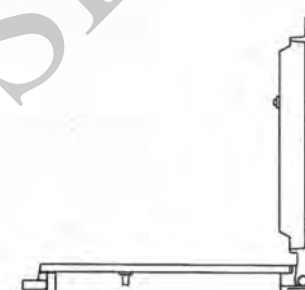
SECTION G-G



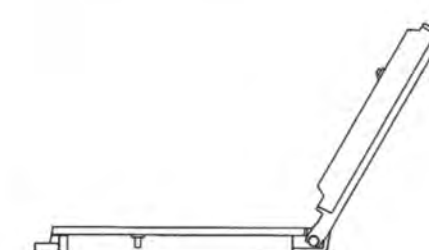
SECTION A-A



SECTION B-B



COVER AT 90 DEGREES
SAFETY STOP POSITION

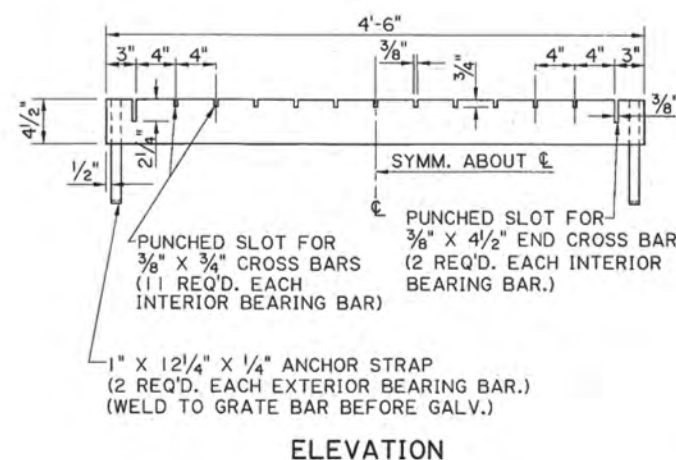
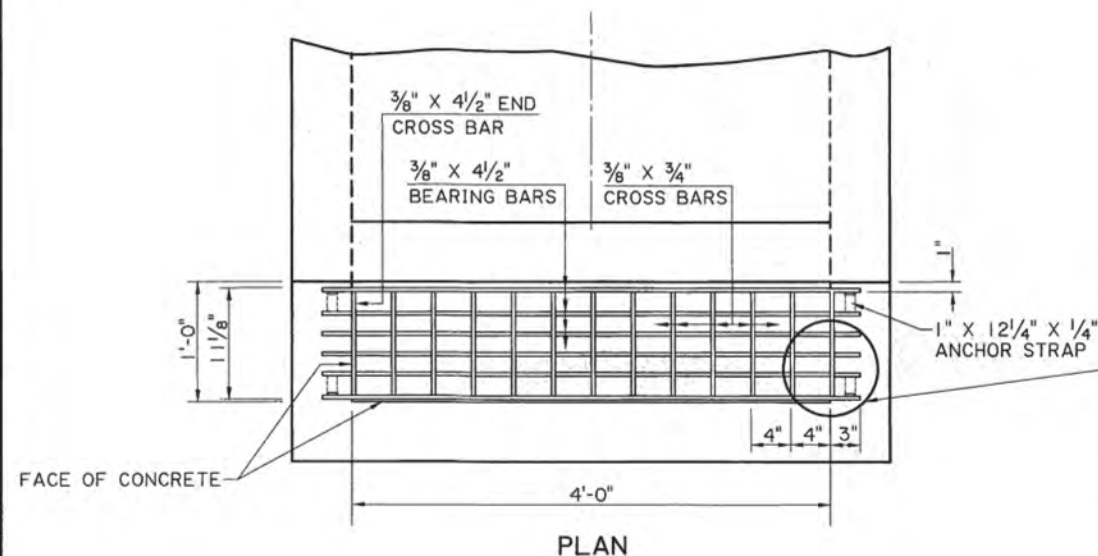


COVER FULLY OPEN
TO 120 DEGREES

TYPE "H_S"

CAST IRON COVER AND FRAME SHOWN (SEE GRATE ABOVE)

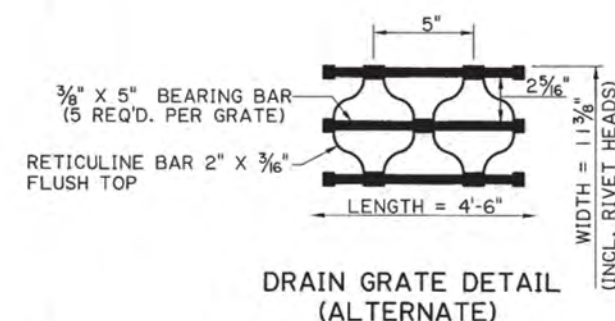
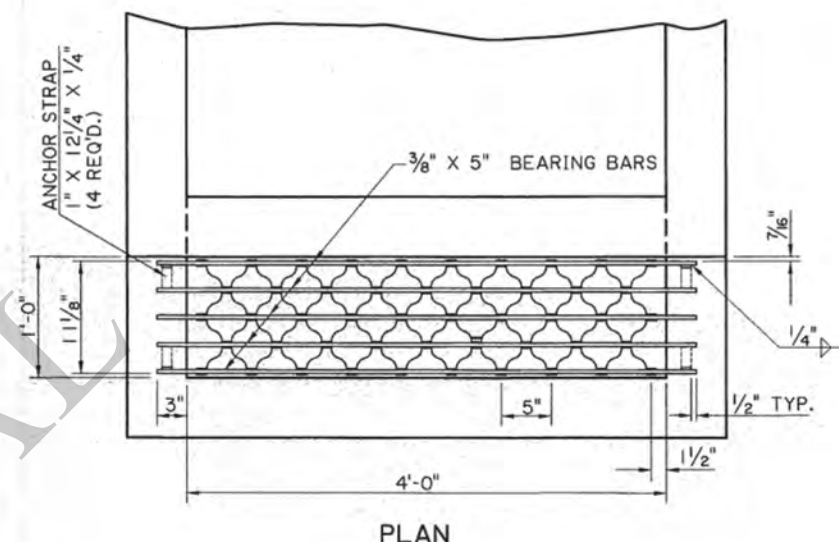
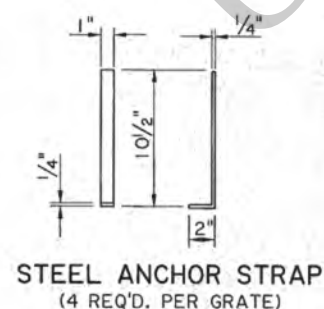
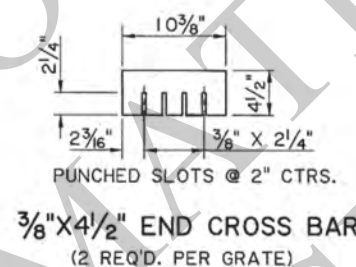
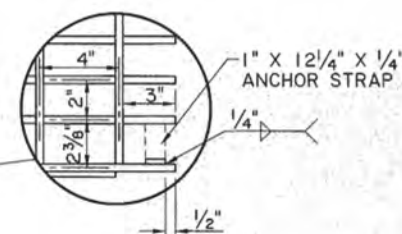




WELDED & SEALED DRAIN GRATE

ALL JOINTS FULL DEPTH 1/4" FILLET WELDS WITH SEAL WELD TOP AND BOTTOM UNLESS NOTED OTHERWISE.

WEIGHT OF DRAIN GRATE = 185 LBS. ± 5%



RIVETED RETICULINE DRAIN GRATE (ALTERNATE)

CENTER TO CENTER OF BEARING BARS EQUAL 2 1/16".

WEIGHT OF DRAIN GRATE = 176 LBS. ± 5%

TYPE "I"
STEEL DRAIN GRATE
GRATE TO BE GALVANIZED AFTER FABRICATION.

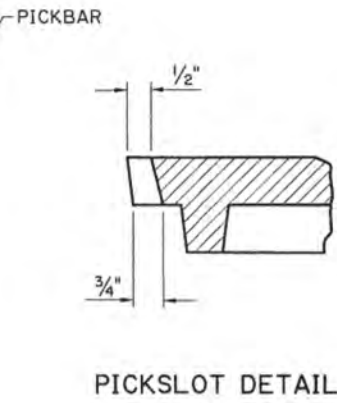


SHEET NUMBER	1
PARISH	
CONTROL SECTION	
STATE PROJECT	
DESIGNED	AMA
CHECKED	AMA
DETAILED	TL
CHECKED	AMA
DATE	9/01/17
SERIES NUMBER	4 OF 6
REVISION DESCRIPTION	
BY	
DATE	5/25/18
APPROVED BY	
CHIEF ENGINEER	
DETAILS OF GRATES, GRATE FRAMES AND COVERS FOR CATCH BASINS AND MANHOLES	
STANDARD	MC-01
PLAN	
HYDRAULICS SECT.	

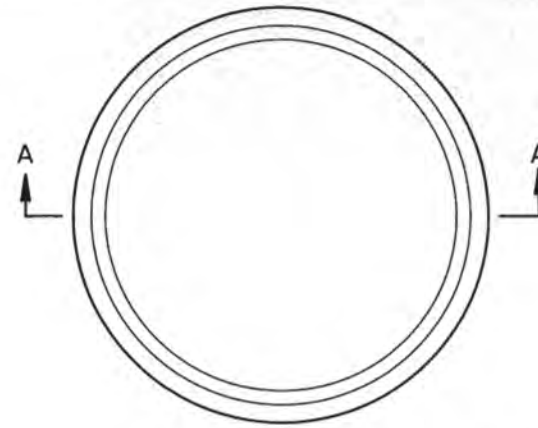




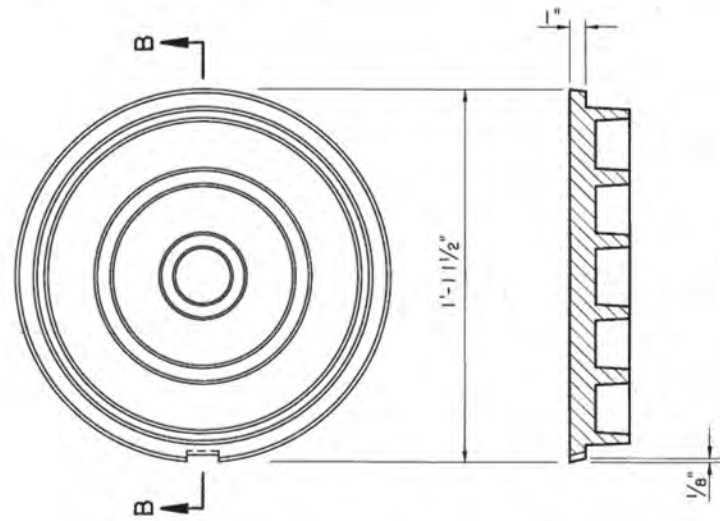
PLAN OF CAST IRON COVER



PICKSLOT DETAIL

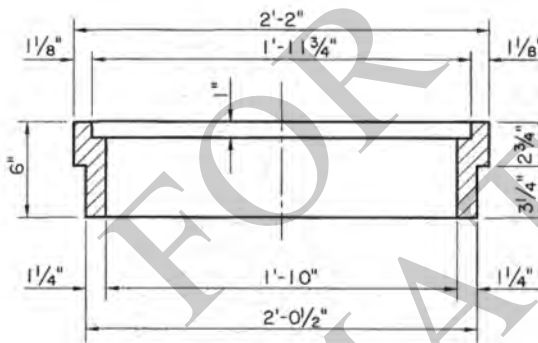


PLAN OF CAST IRON FRAME



BOTTOM OF CAST IRON COVER

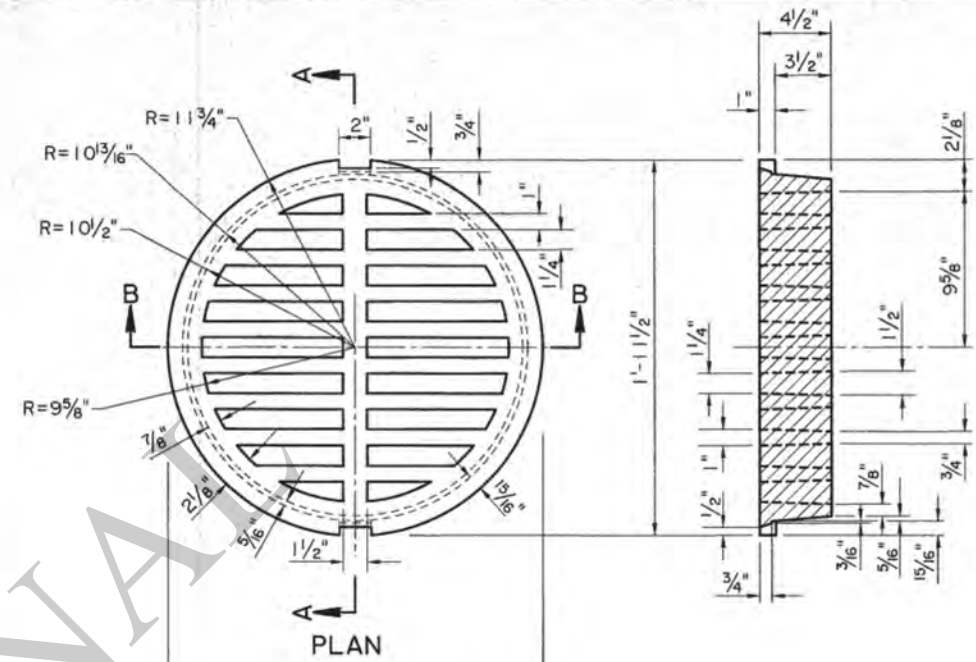
SECTION B-B



SECTION A-A

TYPE "K"

CAST IRON COVER & FRAME
PICKBAR DETAIL LEFT TO FABRICATOR



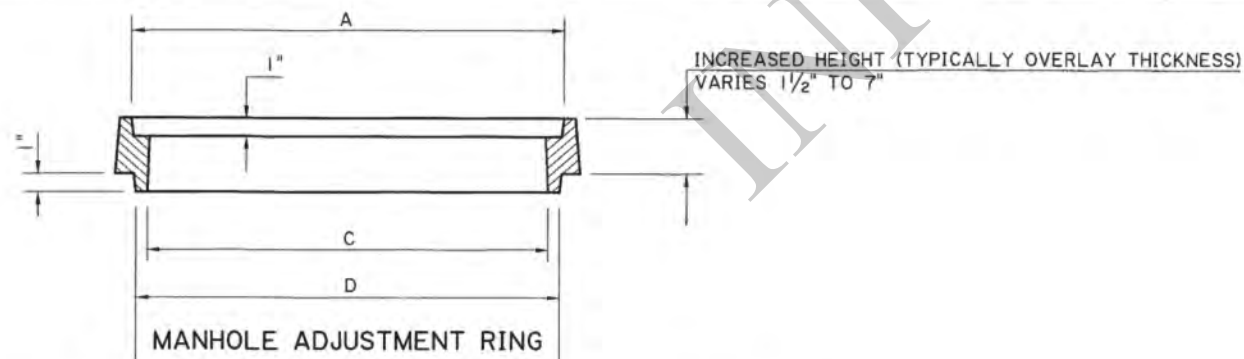
PLAN

SECTION B-B

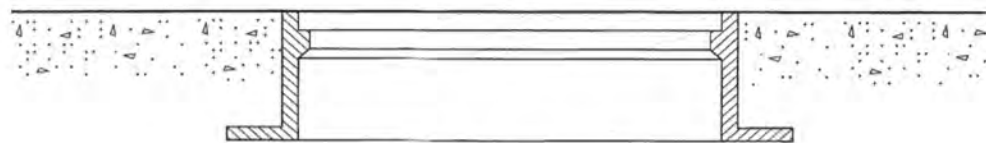
TYPE "K1"

CAST IRON GRATE

- NOTES: 1. APPROX. WEIGHT OF CAST IRON COVER = 250 LBS.
2. TO BE USED WITH TYPE "K" CAST IRON FRAME.



MANHOLE ADJUSTMENT RING



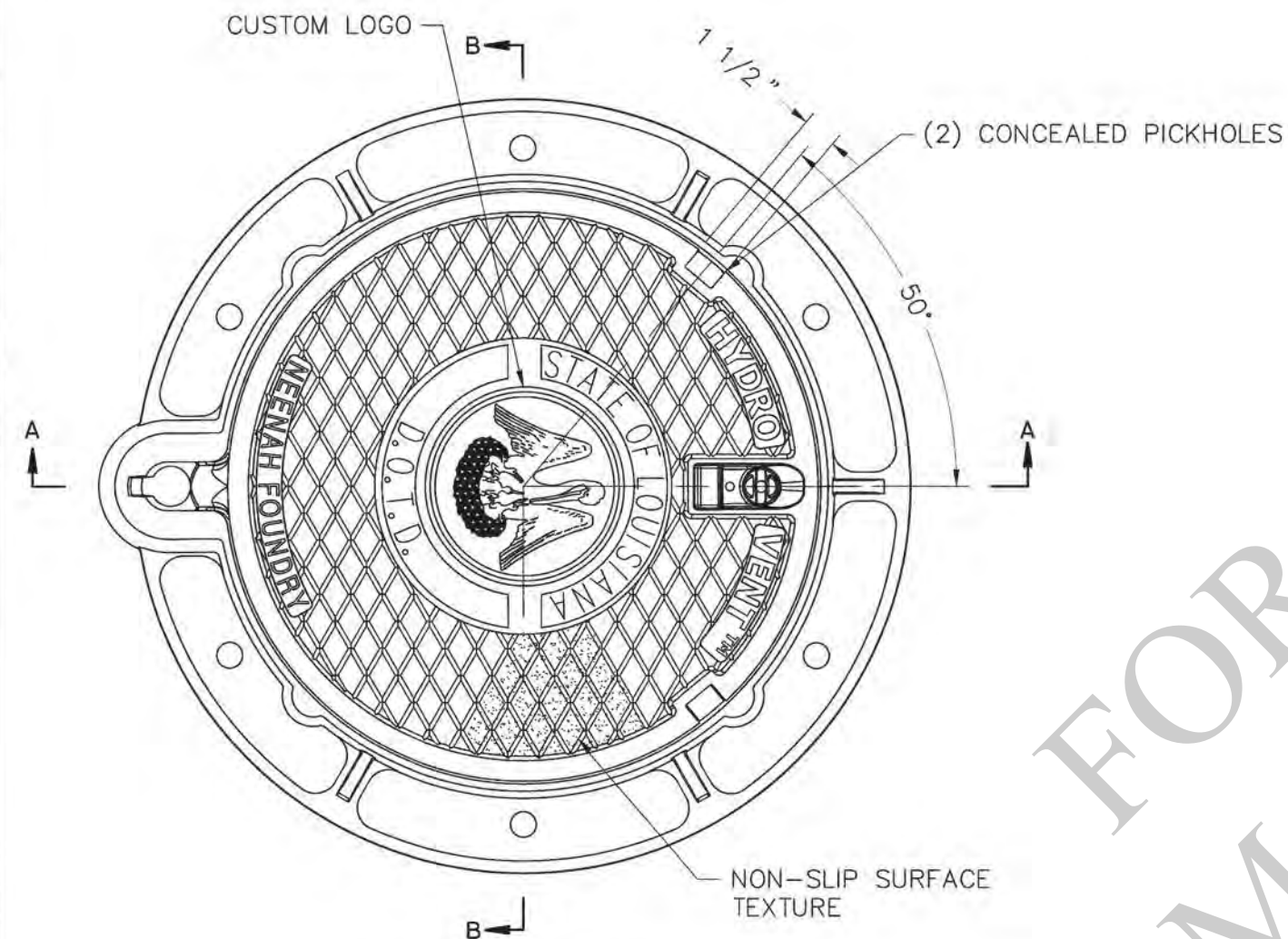
EXISTING GRATE SEAT

MANHOLE ADJUSTMENT RINGS		
A (IN.)	C (IN.)	D (IN.)
23 1/2	22 1/4	23 1/2
23 3/4	22 1/2	23 3/4

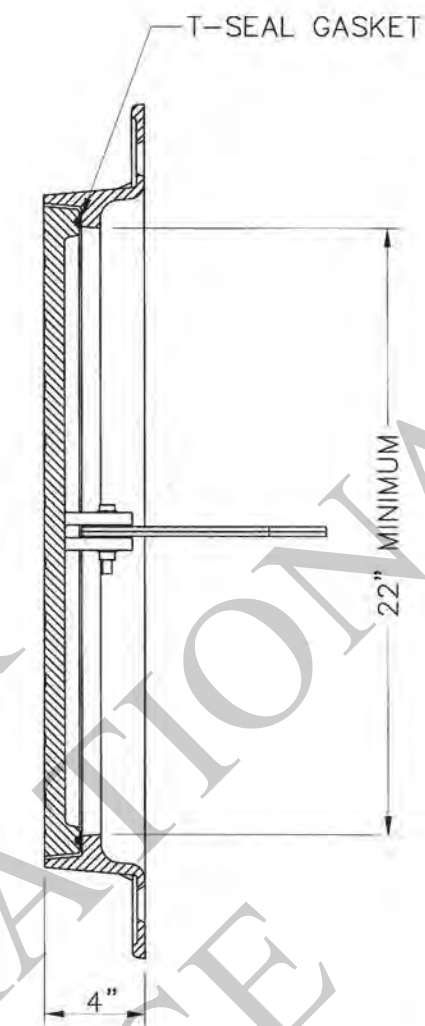
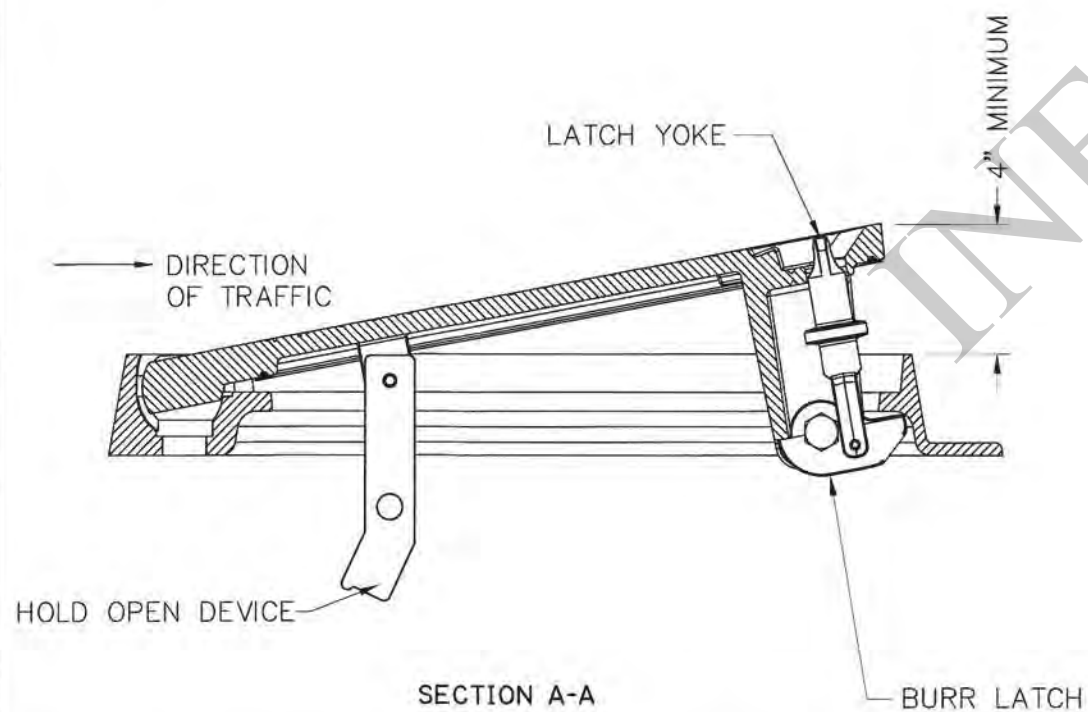
MANHOLE ADJUSTMENT RING

CAST IRON OR STEEL

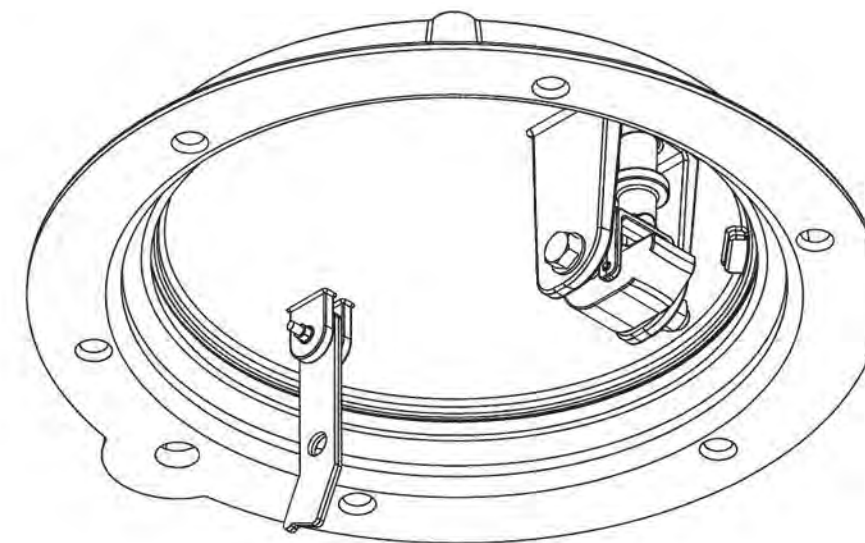
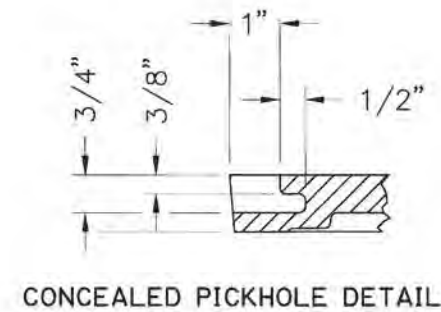




PLAN OF CAST IRON COVER



SECTION B-B



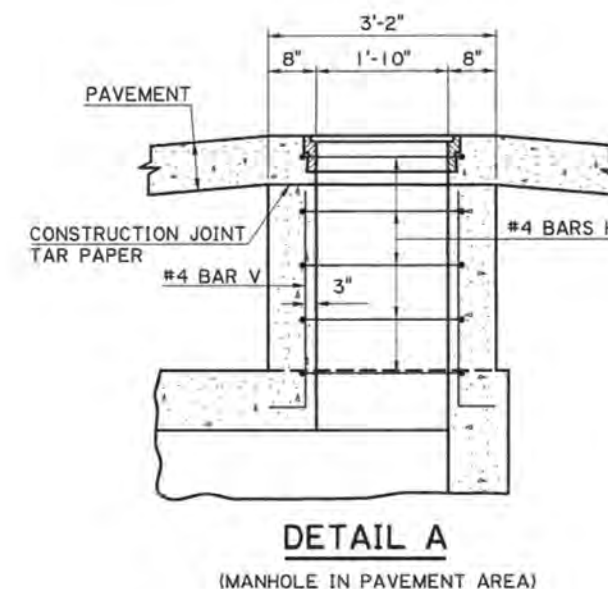
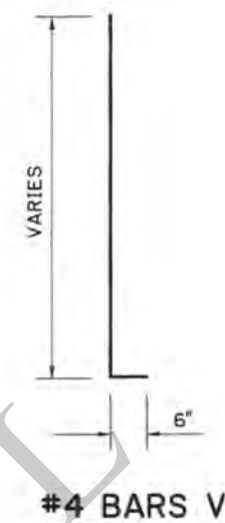
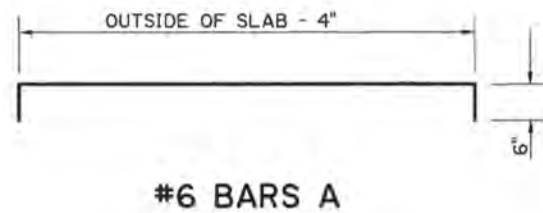
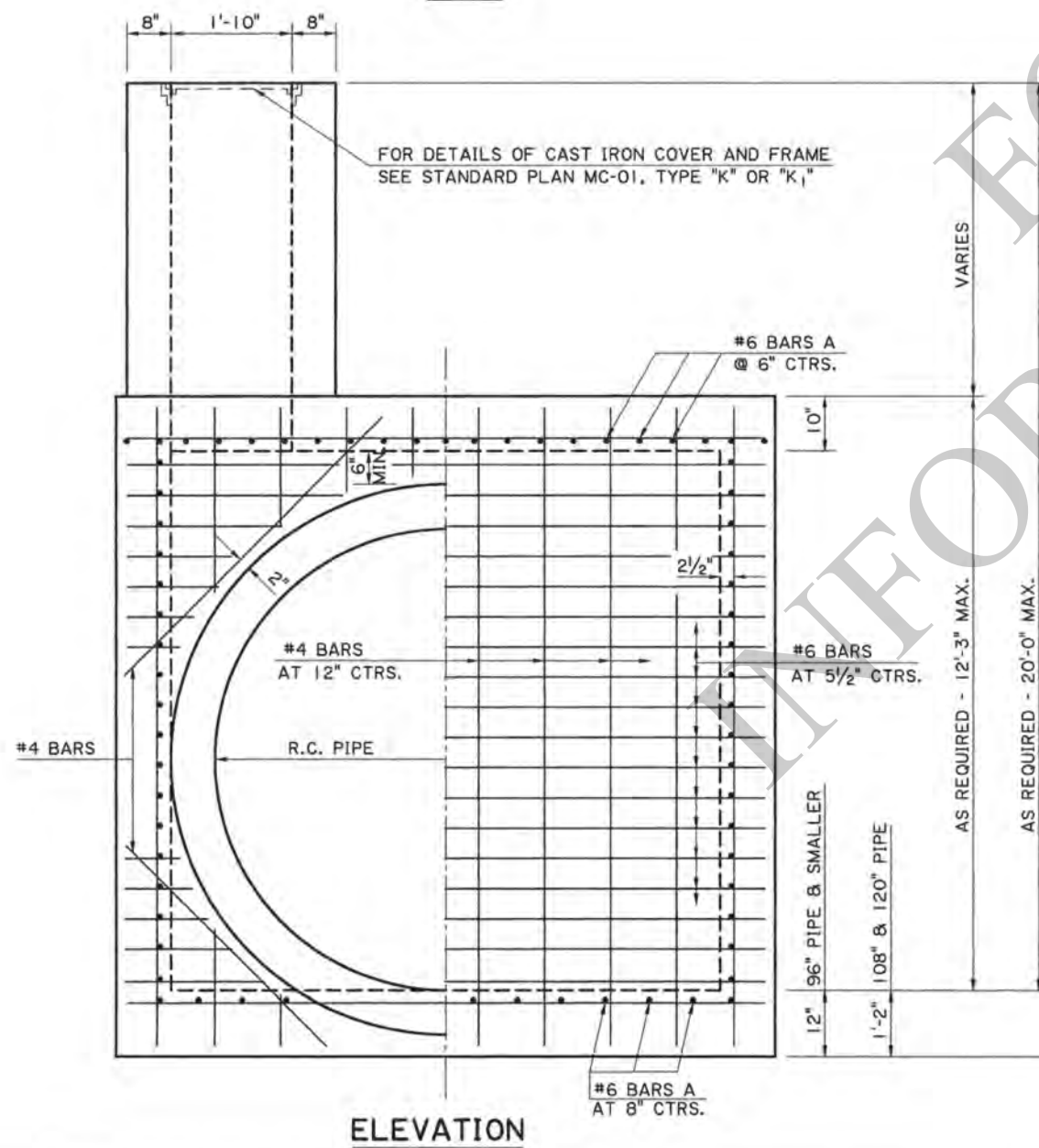
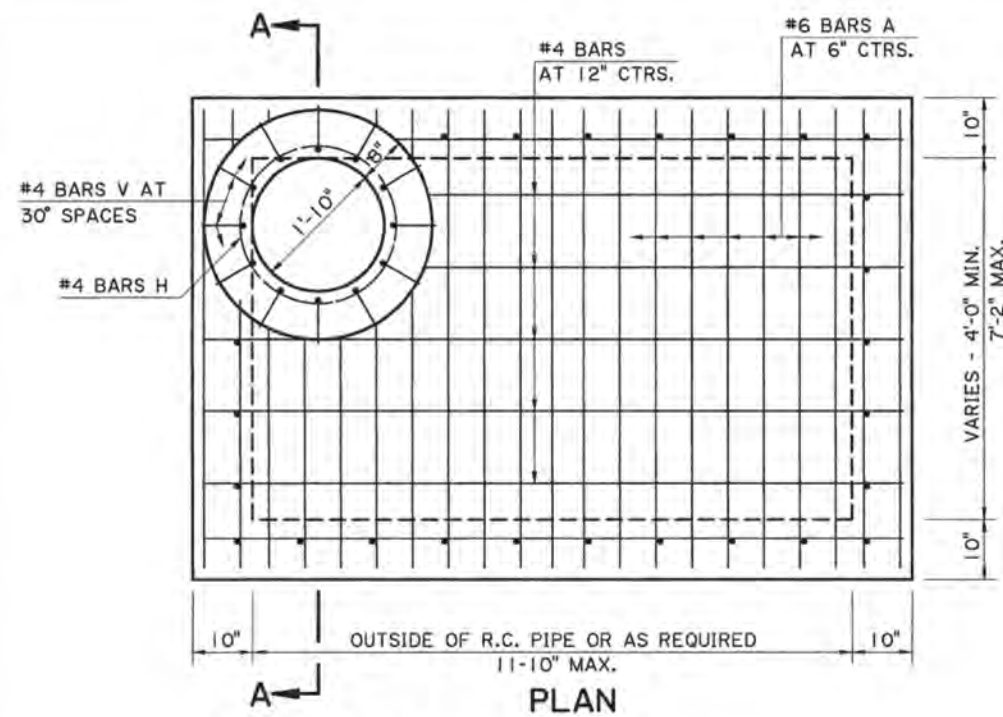
ISOMETRIC BOTTOM VIEW

VENTING MANHOLE **CAST IRON COVER AND FRAME**

NEENAH FOUNDRY 1650-HV SHOWN
EJ STORMSURGE 24 APPROVED BUT
NOT SHOWN



SHEET NUMBER		PARISH		CONTROL SECTION		STATE PROJECT	
DESIGNED AMA		CHECKED AMA		REVIEWED TL		DATE: 12/01/17	
BY		REVISION DESCRIPTION		DATE: 5/25/18		APPROVED BY	
DATE		CHIEF ENGINEER		PROJECT		SHEET NUMBER	
DETAILS OF GRATES, GRATE FRAMES AND COVERS		FOR CATCH BASINS AND MANHOLES		STANDARD PLAN		HYDRAULICS SECT.	



GENERAL NOTES:

1. MANHOLE IS DESIGNED ACCORDING TO 4TH ED. 2007 AASHTO LRFD PROCEDURES. SECTION 702 OF THE DOTD STANDARD SPECIFICATIONS SHALL APPLY.
2. CONCRETE: ALL CONCRETE SHALL BE CLASS "M" MINOR STRUCTURE. ALL EXPOSED EDGES SHALL BE CHAMFERED $\frac{3}{4}$ IN. EXCEPT AS NOTED.
3. REINFORCING STEEL: REINFORCING STEEL SHALL BE GRADE 60. DIMENSIONS ARE TO BAR CENTERS. MINIMUM COVER FOR REINFORCING BARS SHALL BE 2 IN. CLEAR UNLESS SHOWN OTHERWISE.
4. SEE "DETAIL A" FOR DETAILS OF MANHOLE IN A PAVEMENT AREA.
5. THE CONTRACTOR WILL NOT POUR ABOVE THE BOTTOM OF THE SLAB UNTIL THE PAVING ADJACENT TO THE MANHOLE HAS BEEN COMPLETED.

SHEET NUMBER		PARISH	DESIGNED	CDJ	DATE	STATE
5-18-11		CORRECTED DRAFTING ERROR OF BARS IN PLAN VIEW	WMR	CDJ	10-12-81	LA
11-22-10		REVISED TO 2007 AASHTO LRFD PROCEDURES	MH	HJB		
10-22-08		REDRAFTED, REMOVED MANHOLE STEPS, NEW SHEET	JCM	CDJ		
DATE		REVISION DESCRIPTION	BY	CHECKED		
APPROVED BY						



R.C. MANHOLE
 MAXIMUM DIMENSIONS: 11'-10" x 7'-2"
 MAXIMUM DEPTH: 20'



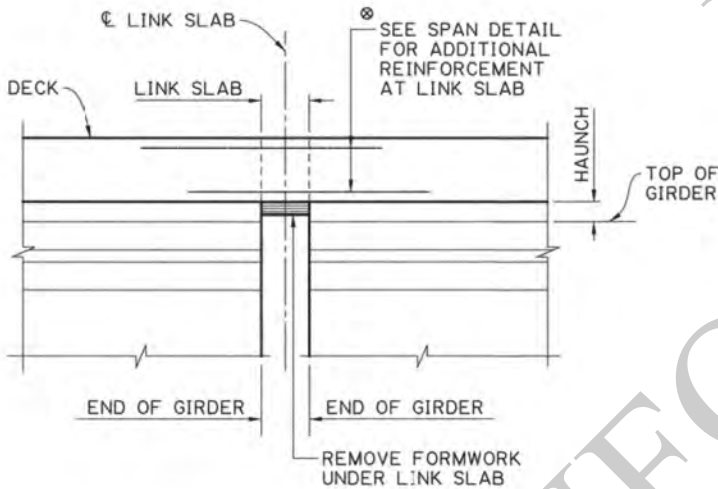
HYDRAULIC SECTION

MISCELLANEOUS SPAN DETAILS INDEX

	SERIES	DESCRIPTION
COMMON	1 OF 1	INDEX, CROWN, DECK PLACEMENT, FORMWORK @ LINK SLAB
DECK DRAINS	1 OF 1	DECK DRAINS
EXPANSION JOINTS	1 OF 2	SEALED EXPANSION JOINT - END DAMS AND PREFORMED NEOPRENE
	2 OF 2	SEALED EXPANSION JOINT - END DAMS AND PREFORMED NEOPRENE
	1 OF 2	SEALED EXPANSION JOINT - END DAMS AND PREFORMED SILICONE
	2 OF 2	SEALED EXPANSION JOINT - END DAMS AND PREFORMED SILICONE
	1 OF 1	POURED SILICONE JOINT

MISCELLANEOUS SPAN GENERAL NOTES:

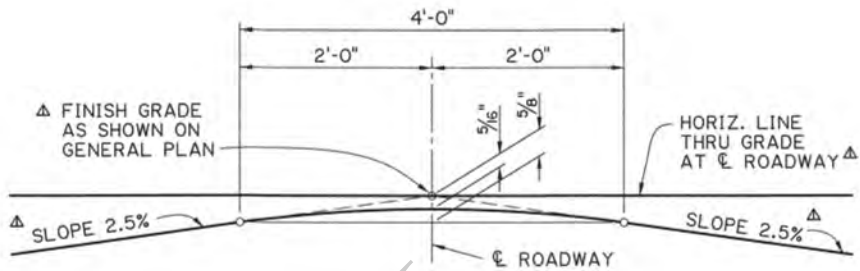
1. SHEETS LISTED IN THE INDEX THAT DO NOT APPLY TO THE PROJECT HAVE NOT BEEN INCLUDED IN THE PLANS.
2. UNLESS STATED OTHERWISE, SECTION NUMBER REFERENCES (SUCH AS "SECTION 805") ARE TO THE LOUISIANA STANDARD SPECIFICATIONS FOR ROADS AND BRIDGES.



FORMWORK AT LINK SLAB

(N.T.S.)

- ⊗ DECK REINFORCEMENT NOT SHOWN FOR CLARITY. DO NOT PLACE DECK REINFORCEMENT SPLICES WITHIN LIMITS OF LINK SLAB REINFORCEMENT.



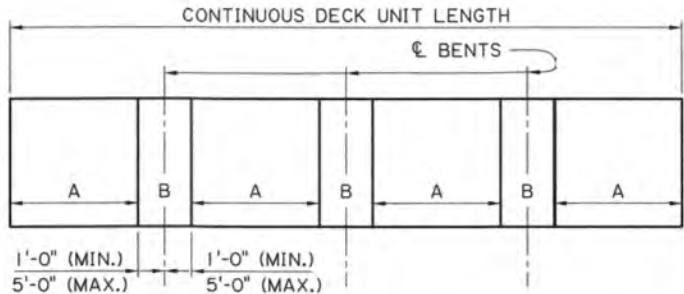
PARABOLIC CROWN AT ROADWAY

(N.T.S.)

- ⊗ UNLESS OTHERWISE NOTED IN PLANS

DECK PLACEMENT NOTES:

1. CONFORM TO SECTION 805.
2. PLACE DECK UNIT USING ONE CONTINUOUS PLACEMENT.
3. PREVENT INITIAL SET FROM OCCURING WITHIN AND DURING PLACEMENT.
4. LIMIT PLACEMENT DURATION TO 4 HOURS MAXIMUM. IF MORE TIME IS NEEDED, INCLUDE METHOD AND SPECIFICATIONS FOR REDUCING CONCRETE SET TIME IN THE CONCRETE PLACEMENT PLAN REQUIRED BY SECTION 805.
5. IF DECK UNIT PLACEMENT CANNOT BE CONTINUOUS, THE SEGMENTED PLACEMENT SHOWN BELOW MAY BE USED IF PERMITTED BY THE ENGINEER. PLACE AND CURE SEGMENTS "A" TOGETHER PRIOR TO PLACING AND CURING SEGMENTS "B."



SEGMENTED DECK PLACEMENT SEQUENCE

(N.T.S.)

SHEET NUMBER

PARISH

DESIGN

CHECK

DETAIL

REVIEW

SERIES

1 OF 1

ALANCASTER

K. KEMP

ALANCASTER

K. KEMP

Y. SHEN

STATE OF LOUISIANA

ADAM LANCASTER

License No. 35573

PROFESSIONAL ENGINEER

IN

CIVIL ENGINEERING

5/4/2021

APPROVED BY CHIEF ENGINEER:

DATE: 5/12/2021

STATE OF LOUISIANA

CONFIDENTIAL

MISC. SPAN DETAILS

INDEX, CROWN, DECK PLACEMENT

FORMWORK @ LINK SLAB

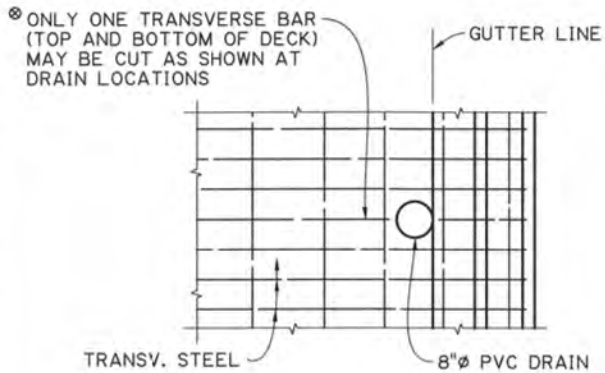
SPAN-COMMON

STANDARD PLAN

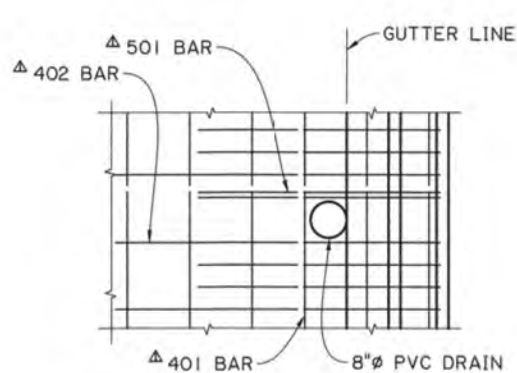
DOTD

LOUISIANA DEPARTMENT OF TRANSPORTATION & DEVELOPMENT

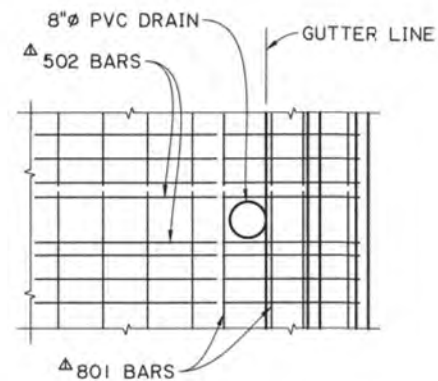
BRIDGE AND STRUCTURAL DESIGN



PLAN AT DECK DRAIN
(GIRDER BRIDGE)



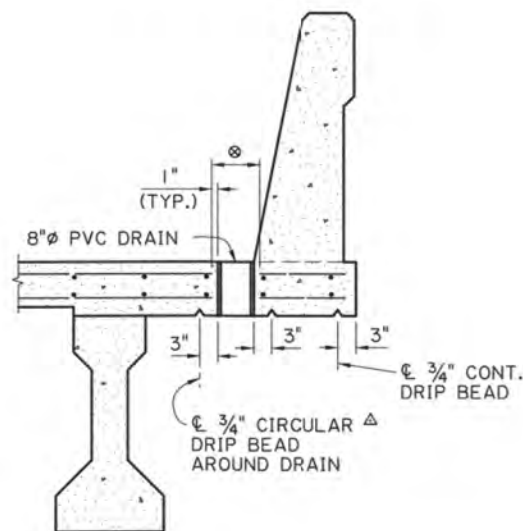
PLAN AT DECK DRAIN
(SLAB SPAN - TOP STEEL)



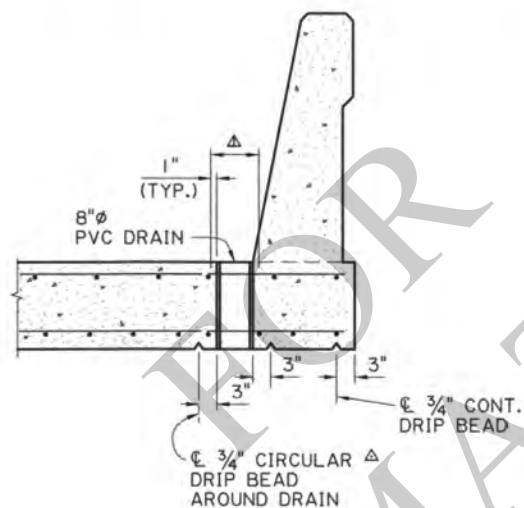
PLAN AT DECK DRAIN
(SLAB SPAN - BOTTOM STEEL)

NOTES:

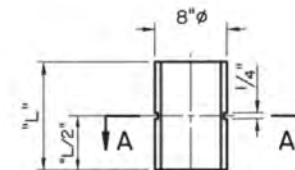
1. PVC DECK DRAINS REQUIRED IF BRIDGE RAILING SLOT DRAINS ARE NOT USED. SEE PROJECT PLANS FOR SPECIFIED TYPE AND LOCATION OF DECK DRAINAGE DEVICES.
2. A 1/2" EXTENSION OF DECK DRAIN PIPE BELOW THE BOTTOM OF THE DECK MAY BE USED IN LIEU OF CIRCULAR DRIP BEAD.
3. FOR DECK OVERHANGS LESS THAN 4'-4" USING LG GIRDERS, SLOTTED BARRIERS OR AN ALTERNATE DECK DRAIN CONFIGURATION MUST BE USED.
4. ADJUST SLAB SPAN TOP AND BOTTOM STEEL AS NEEDED (BY SHIFTING OR BUNDLING TO ADJACENT REBAR) TO AVOID DECK DRAINS. MAINTAIN MINIMUM SPECIFIED CONCRETE COVER.
5. BRIDGE RAILING SLOT DRAINS WILL BE PAID FOR AS PART OF THE BRIDGE RAILING PAY ITEM. DECK DRAIN PIPES WILL BE PAID FOR AS PART OF THE DECK CONCRETE PAY ITEM.



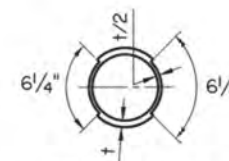
SECTION AT DECK DRAIN - AASHTO GIRDER
(N.T.S.)



SECTION AT DECK DRAIN - SLAB SPAN
(N.T.S.)

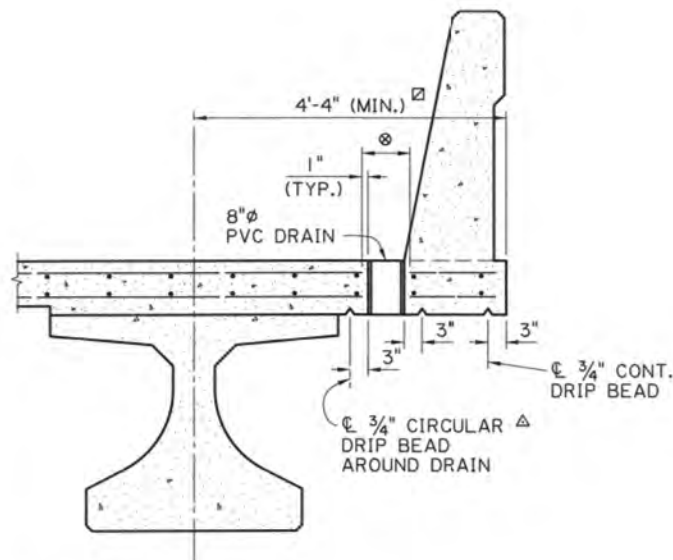


ELEVATION

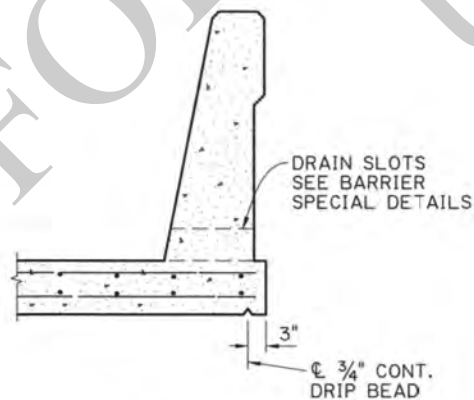


SECTION A-A

DETAIL "A" - PVC DRAIN
SHOWING GROOVE DETAILS
(N.T.S.)



SECTION AT DECK DRAIN - LG GIRDER
(N.T.S.)



SECTION THRU SLOTTED BARRIER
(GIRDER OR SLAB SPAN BRIDGES)
(N.T.S.)

SHEET NUMBER		PARISH		CONTROL SECTION		STATE PROJECT	
DESIGN		CHECK		DETAIL		REVIEW	
A. LANCASTER		K. KEMP		A. LANCASTER		Y. SHEN	
1		1		1		1	

STATE OF LOUISIANA

ADAM LANCASTER

License No. 35573

PROFESSIONAL ENGINEER

IN

CIVIL ENGINEERING

5/14/2021

APPROVED BY CHIEF ENGINEER:

5/12/2021

DATE:

STATE OF LOUISIANA

MISC. SPAN DETAILS

DECK DRAINS

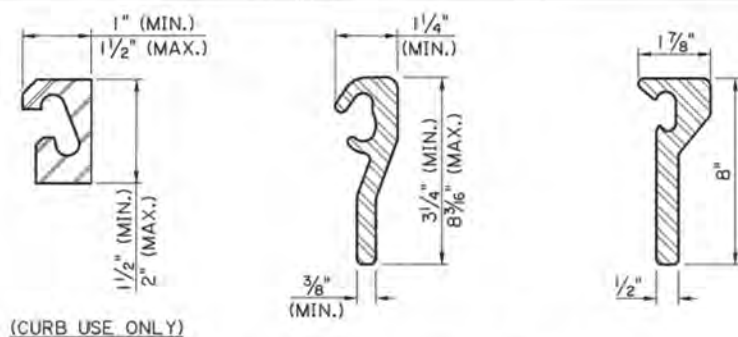
DECK-RAIN

STANDARD PLAN

DOTD

LOUISIANA DEPARTMENT OF TRANSPORTATION & DEVELOPMENT

BRIDGE AND STRUCTURAL DESIGN



(CURB USE ONLY)

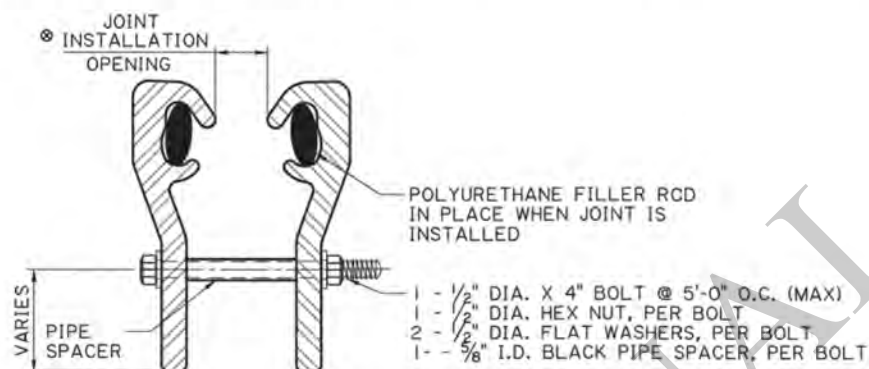
TYPICAL STEEL EXTRUSIONS (END DAMS)



TYPICAL NEOPRENE SEALS

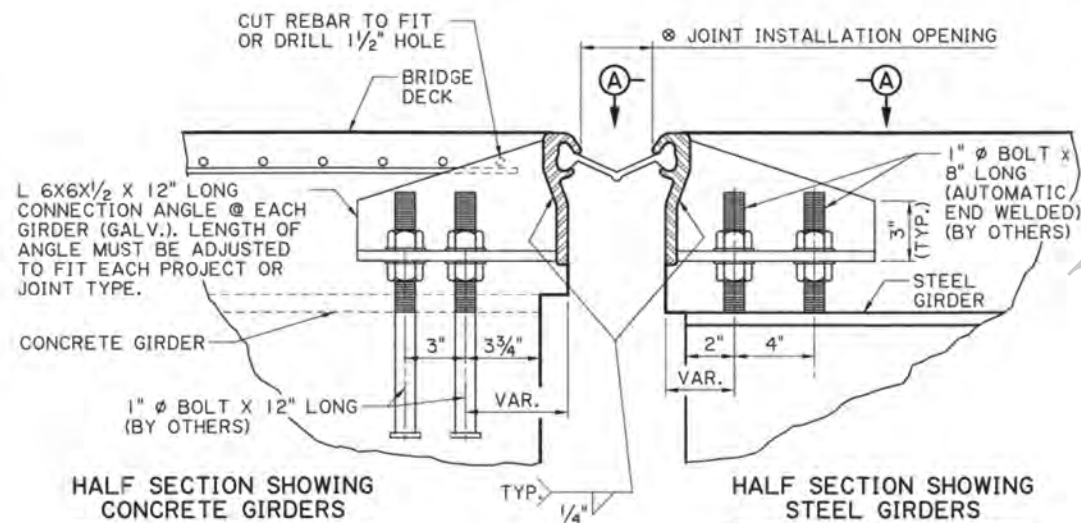
END DAM INSTALLATION PROCEDURE:

1. PLACE END DAM ASSEMBLY AS A UNIT WITH PIPE SPACERS AND BOLTS IN PLACE.
2. ADJUST ASSEMBLY TO CORRECT VERTICAL POSITION AND INSTALLATION OPENING. TIGHTEN ONE SIDE INTO PLACE USING ANCHOR BOLTS IN GIRDERS. HAND TIGHTEN OPPOSITE SIDE.
3. TIGHTEN OPPOSITE SIDE JUST PRIOR TO DECK PLACEMENT.
4. CAST DECK.
5. CUT/REMOVE PIPE SPACER AND BOLT AS SOON AS CONCRETE WILL SUPPORT LOAD WITHOUT OVERSTRESSING OR DAMAGING CONCRETE, BUT NO LONGER THAN 8 HOURS AFTER DECK PLACEMENT.
6. REPAIR DAMAGE TO EXPOSED GALVANIZATION.



END DAM SHIPPING AND INSTALLATION ASSEMBLY

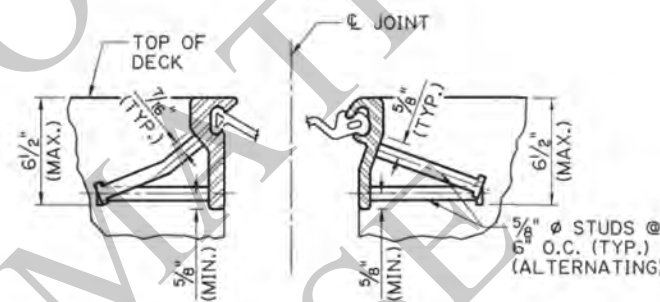
(ANCHOR ANGLES AND ANCHOR STUDS NOT SHOWN)



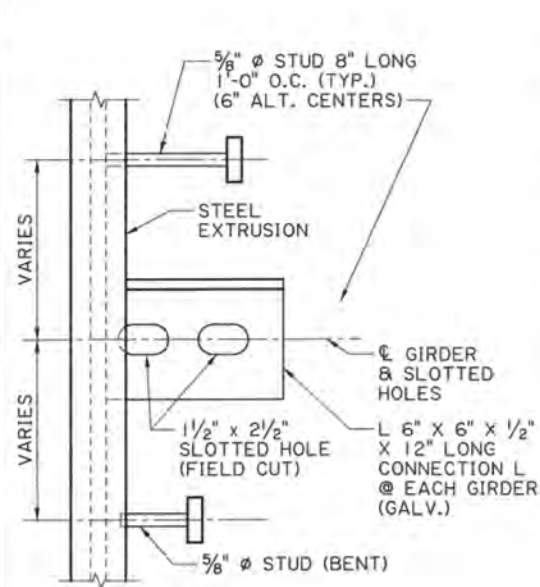
HALF SECTION SHOWING CONCRETE GIRDERS

HALF SECTION SHOWING STEEL GIRDERS

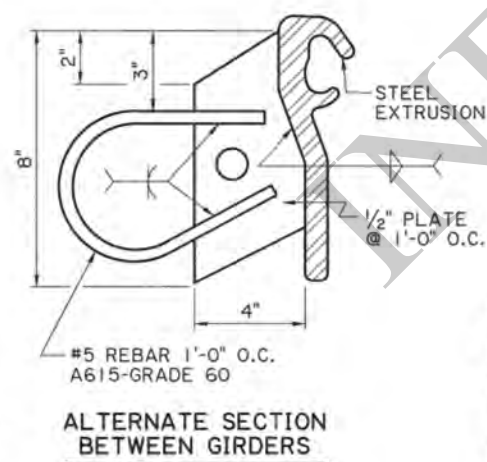
TYPICAL SECTION AT GIRDERS



TYPICAL HALF-SECTIONS BETWEEN GIRDERS

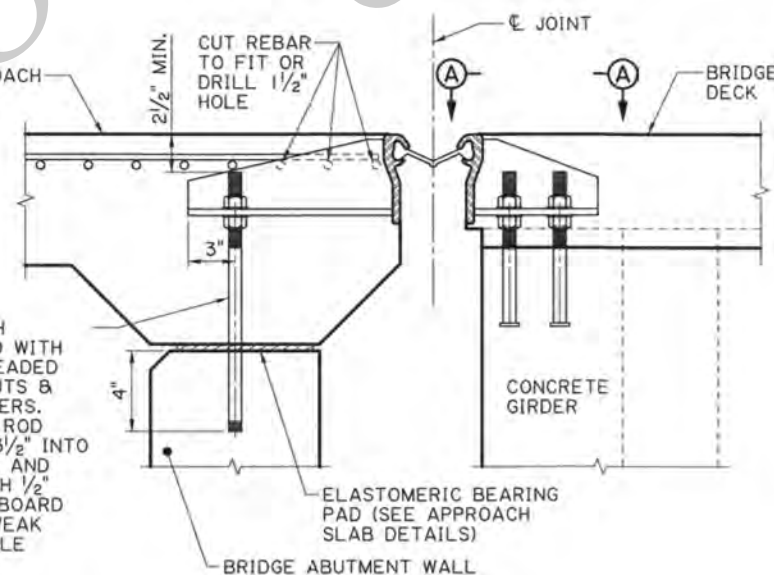


SECTION A-A



ALTERNATE SECTION BETWEEN GIRDERS

3/4" SMOOTH ANCHOR ROD WITH TOP 6" THREADED w/ 2-HEX NUTS & 2-CUT WASHERS. BOTTOM OF ROD EMBEDDED 3/2" INTO RISER WALL AND CAPPED WITH 1/2" THICK CARDBOARD OR OTHER WEAK COMPRESSIBLE MATERIAL.



TYPICAL SECTION AT BRIDGE END @ GIRDERS

NOTES:

1. JOINT FABRICATION AND CONSTRUCTION SHALL BE IN ACCORDANCE WITH SECTION 815.
 2. PROVIDE HOT-DIPPED GALVANIZED ANCHOR RODS AND ANCHOR BOLTS IN CONFORMANCE WITH SECTION 807.
 3. THE MANUFACTURER'S RECOMMENDED CONSTRUCTION METHODS SHALL BE FOLLOWED.
 4. THE NEOPRENE SEAL MANUFACTURER'S REPRESENTATIVE SHALL BE PRESENT DURING INITIAL SEAL INSTALLATION(S) UNTIL SUCH TIME AS THE PROJECT ENGINEER IS SATISFIED WITH SEAL INSTALLATION. AFTER INITIAL INSTALLATION, PROVIDE SEAL MANUFACTURER'S REPRESENTATIVE AS NEEDED UPON PROJECT ENGINEER'S REQUEST.
 5. SUBMIT SHOP DRAWINGS IN ACCORDANCE WITH SECTION 801.
 6. SHIP END DAMS IN ACCORDANCE WITH THESE DETAILS.
 7. PLACE POLYURETHANE FILLER ROD IN EXTRUSION CAVITY PRIOR TO SHIPMENT. REMOVE FILLER ROD ONLY WHEN NEOPRENE SEAL IS INSTALLED.
 8. FOR WELDS, CONFORM TO SECTION 809.
 9. JOINTS UP TO FIFTY-FOUR (54) FEET IN LENGTH SHALL BE DELIVERED TO THE JOB SITE IN ONE PIECE. JOINTS OVER FIFTY-FOUR (54) FEET IN LENGTH MAY HAVE PROVISIONS FOR A FIELD SPLICE IN THE END DAM EXTRUSION, PROVIDED THE SPLICE IS PERFORMED IN SHOP-LIKE CONDITIONS IN THE PRESENCE OF THE DOTD FABRICATION INSPECTOR.
 10. WELDED SPLICES IN END DAM EXTRUSIONS SHALL BE SHOP SPLICES. EXTRUSION SECTIONS BETWEEN WELDED SHOP SPLICES SHALL NOT BE LESS THAN 15 FEET IN LENGTH, EXCEPT THAT ONE SECTION NO LESS THAN 4 FEET IN LENGTH WILL BE ALLOWED IN THE SHOULDER AREA IF REQUIRED TO MATCH ROADWAY CROSS SECTION. SPLICES SHALL BE OUTSIDE OF WHEEL PATHS. SEE WHEEL PATH LOCATIONS DETAIL.
- WELDED SPLICES SHALL BE BUTT WELDS. WELD MATERIAL IN THE CAVITY WILL BE CAUSE FOR REJECTION. SHOP WELDED SPLICES ARE ALSO REQUIRED WHERE TWO DIFFERENT SHAPES ARE JOINED AT THE CURB WHERE CURB UNITS ARE TURNED UP. SHOW ALL SHOP AND FIELD SPLICE LOCATIONS IN THE SHOP DRAWINGS. SPLICE LOCATIONS MAY BE DESIGNATED WITH A +/- 6 INCH TOLERANCE.
11. BEND STUDS PRIOR TO WELDING. NO BENDING OF STUDS WILL BE ALLOWED AFTER WELDING EXCEPT AS REQUIRED FOR WELDING INSPECTION.
 12. REPAIR DAMAGED GALVANIZED COATS IN ACCORDANCE WITH SECTION 811.
 13. NEOPRENE SEALS SHALL BE MANUFACTURED AS A CONTINUOUS PIECE WITH ONLY ONE (1) SHOP SPLICE PER JOINT ALLOWED WHEN LENGTH EXCEEDS 50 FEET. SHOW SEAL SPLICE LOCATION ON THE SHOP DRAWINGS. THE NEOPRENE SEAL SHALL CONFORM TO SECTION 1005, WITH THE HARDNESS REQUIREMENT OF ASTM D2628 REVISED TO BE 55-5+/10.
- SEAL SHALL BE BONDED TO EXTRUSION CAVITY WITH A PRE-MIXED ADHESIVE LUBRICATING SOLUTION WHICH SHALL BE USED TO FACILITATE THE SEAL INSTALLATION. THIS ADHESIVE LUBRICANT SHALL BE SELECTED FROM THE DOTD APPROVED MATERIALS LIST. THE LUBRICANT SHOULD FLOW FREELY AND EVENLY COAT THE SEAL AND JOINT FACE. THE LUBRICANT SHALL COMPLETELY COAT THE SEAL AND EXTRUSION CAVITY WHICH REMAINS IN CONTACT.
14. SEE PROJECT PLAN JOINT DATA TABLE FOR DESIGN AND INSTALLATION REQUIREMENTS.
 15. ANCHOR BOLTS IN GIRDER WILL BE PAID FOR AS PART OF THE GIRDER. ANCHOR RODS IN APPROACH SLAB SUPPORT WALL WILL BE PAID FOR UNDER THE STRUCTURAL METALWORK (ANCHOR BOLTS) PAY ITEM. MEASUREMENT AND PAYMENT OF OTHER END DAM AND SEAL ELEMENTS WILL BE IN ACCORDANCE WITH SECTION 815.
 16. JOINTS WILL BE PAID FOR UNDER PAY ITEM SEALED EXPANSION JOINT (END DAMS AND PREFORMED NEOPRENE SEAL).

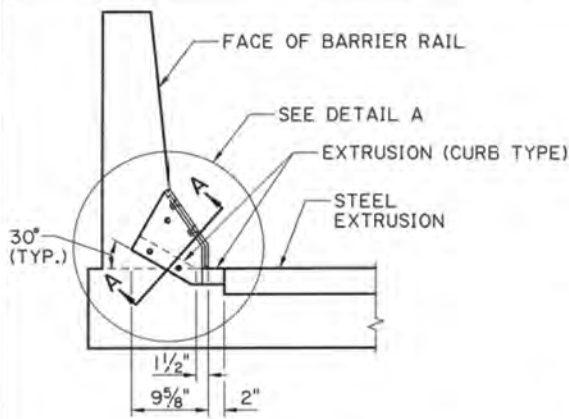
SHEET NUMBER		PARISH		CONTROL SECTION		STATE PROJECT	
DESIGN	CHECK	ALANCASTER	K. KEMP	DETAIL	CHECK	ALANCASTER	K. KEMP
REVIEW	Y. SHEN	SERIES	1 OF 2	REVIEW	Y. SHEN	SERIES	1 OF 2

STATE OF LOUISIANA
ADAM LANCASTER
License No. 35573
PROFESSIONAL ENGINEER
IN
CIVIL ENGINEERING
5/12/2021

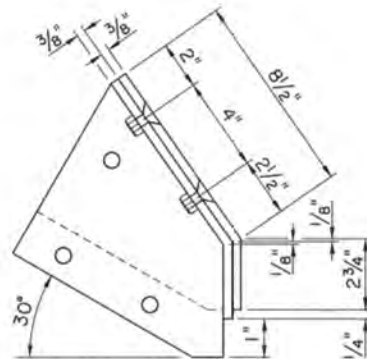
APPROVED BY CHIEF ENGINEER: *Michael P. Kelly* 5/12/2021

STATE OF LOUISIANA
DOTD
LOUISIANA DEPARTMENT OF TRANSPORTATION & DEVELOPMENT
BRIDGE AND STRUCTURAL DESIGN

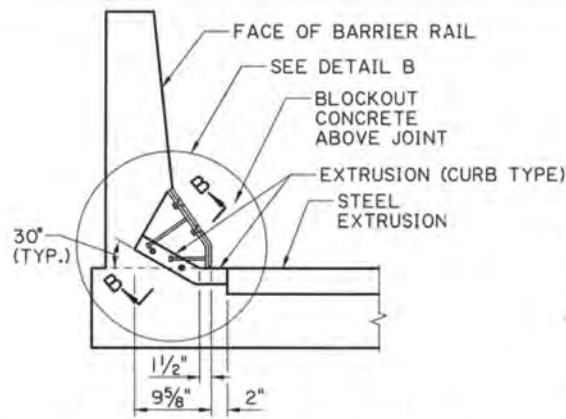
MISC. SPAN DETAILS
SEALED EXPANSION JOINT - END DAMS AND PREFORMED NEOPRENE
JOINT-NP



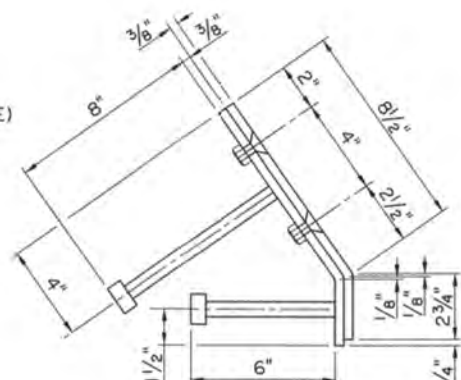
**F-SHAPE BARRIER SECTION
OPTION 1**
(NON-SKEWED STEEL EXTRUSION
AT LOW SIDE OF DECK)



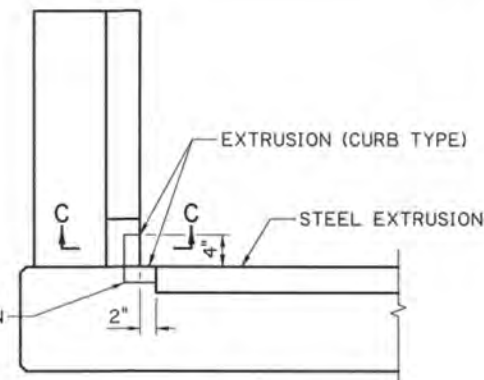
DETAIL A
(SEAL NOT SHOWN)



**F-SHAPE BARRIER SECTION
OPTION 2**
(NON-SKEWED STEEL EXTRUSION
AT LOW SIDE OF DECK)

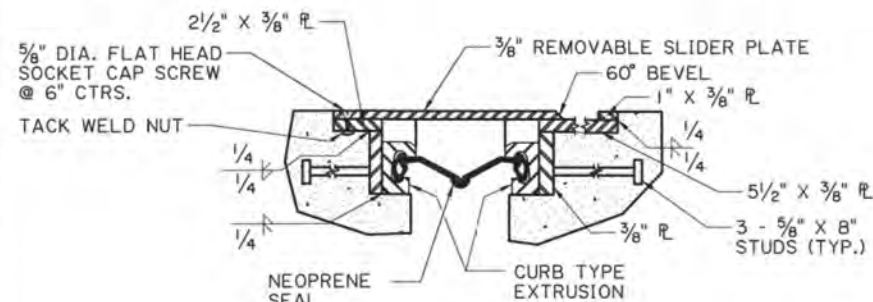


DETAIL B
(SEAL NOT SHOWN)

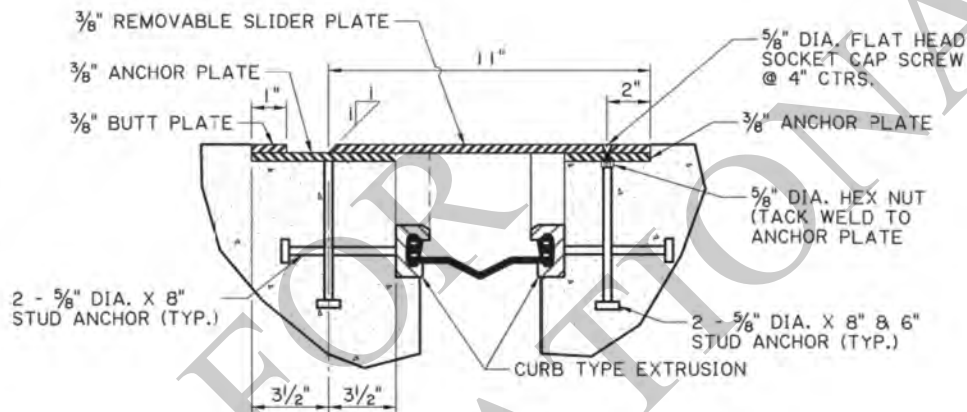


SPECIAL SEAL SECTION
REQUIRED FOR 90°
VERTICAL TURN. ALL
SPICES TO BE HEAT
VULCANIZED IN
FACTORY.

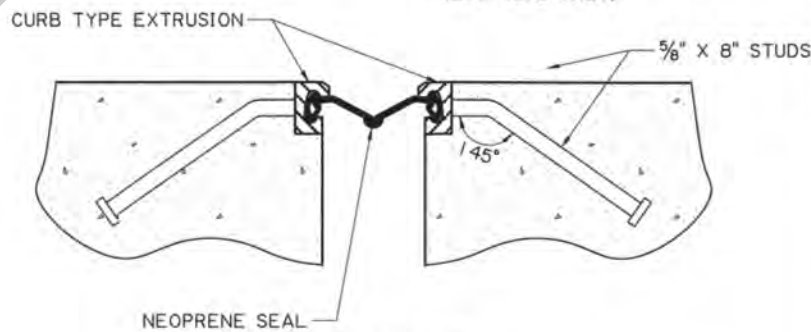
BARRIER SECTION
(QUAD BEAM SPANS @ END BENTS)
(LOW SIDE ONLY)



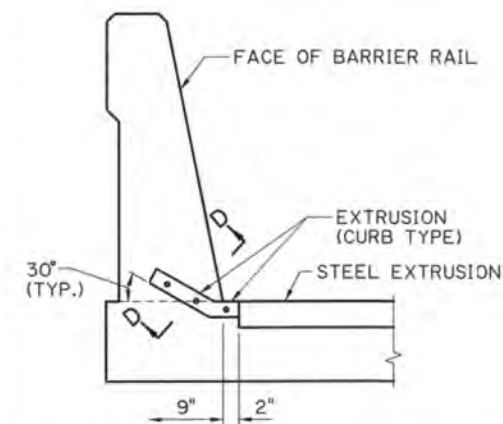
SECTION A-A



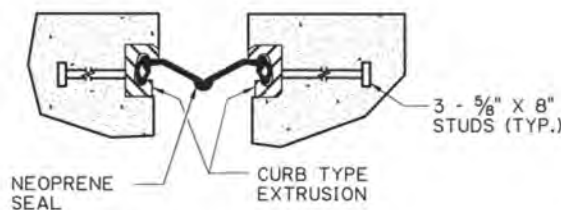
SECTION B-B



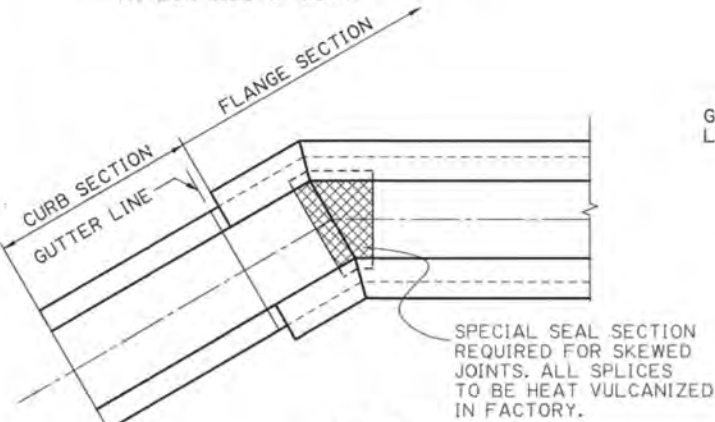
SECTION C-C



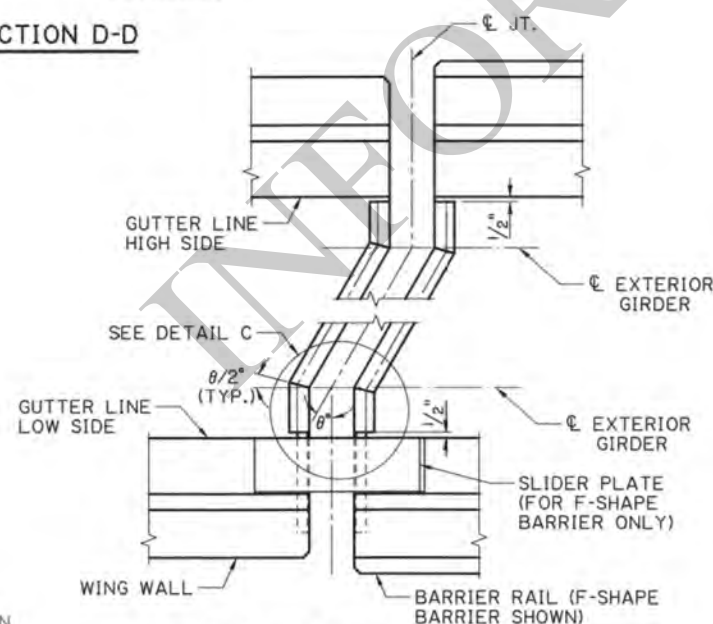
SINGLE SLOPE BARRIER SECTION
(NON-SKEWED STEEL EXTRUSION
AT LOW SIDE OF DECK)



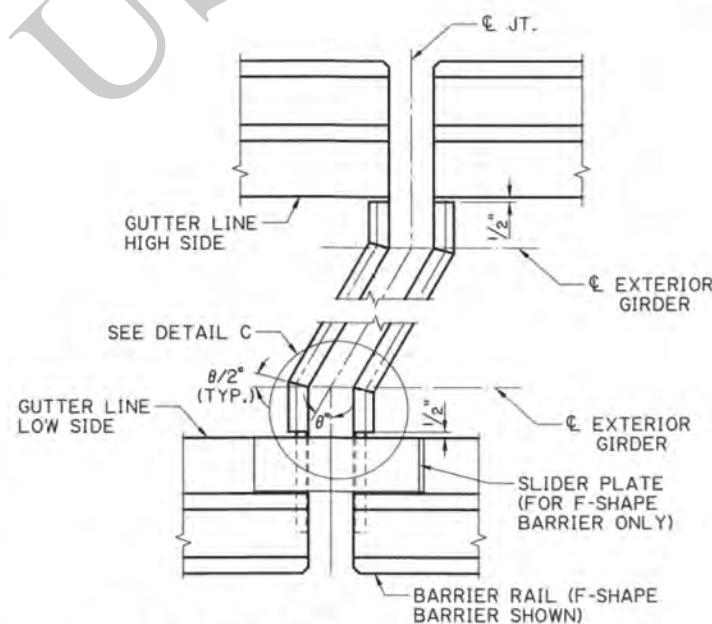
SECTION D-D



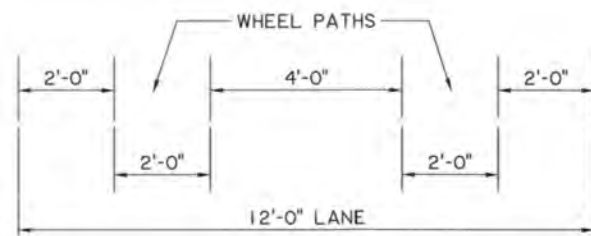
DETAIL C



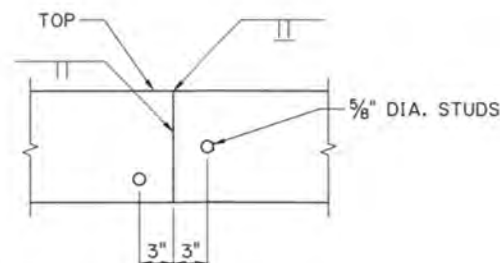
PART PLAN AT END BENTS
(SKEWED JOINT FOR GIRDER BRIDGES)



PART PLAN AT INTERMEDIATE BENTS
(SKEWED JOINT FOR GIRDER BRIDGES)



WHEEL PATH LOCATIONS



TYPICAL END DAM SPLICE

SHEET NUMBER		PARISH		CONTROL SECTION		STATE PROJECT	
ALANCASTER		K. KEMP		ALANCASTER		K. KEMP	
DESIGN		CHECK		DETAIL		REVIEW	
Y. SHEN		Y. SHEN		Y. SHEN		Y. SHEN	
SERIES 2 OF 2		SERIES 2 OF 2		SERIES 2 OF 2		SERIES 2 OF 2	

STATE OF LOUISIANA

ADAM LANCASTER

License No. 35573

PROFESSIONAL ENGINEER

IN

CIVIL ENGINEERING

5/4/2021

APPROVED BY CHIEF ENGINEER:

5/12/2021

DATE:

JOINT-NP

MISC. SPAN DETAILS

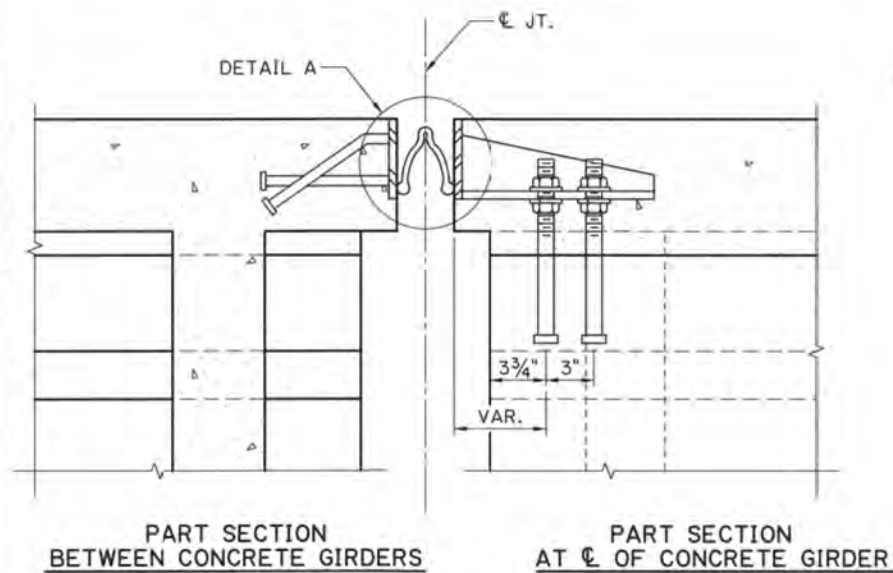
SEALED EXPANSION JOINT - END DAMS AND PREFORMED NEOPRENE

STANDARD PLAN

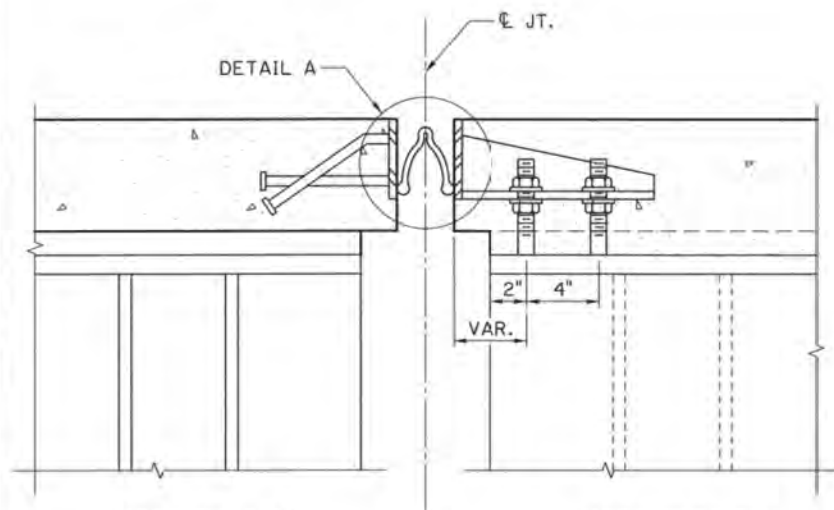
DOTD

LOUISIANA DEPARTMENT OF TRANSPORTATION & DEVELOPMENT

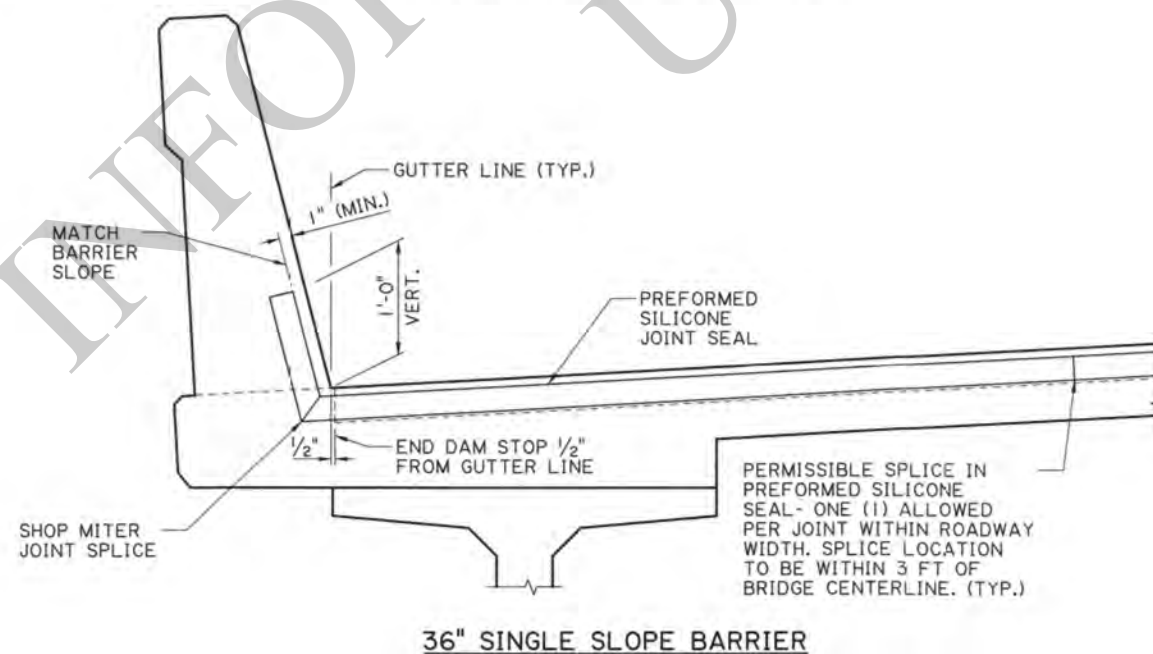
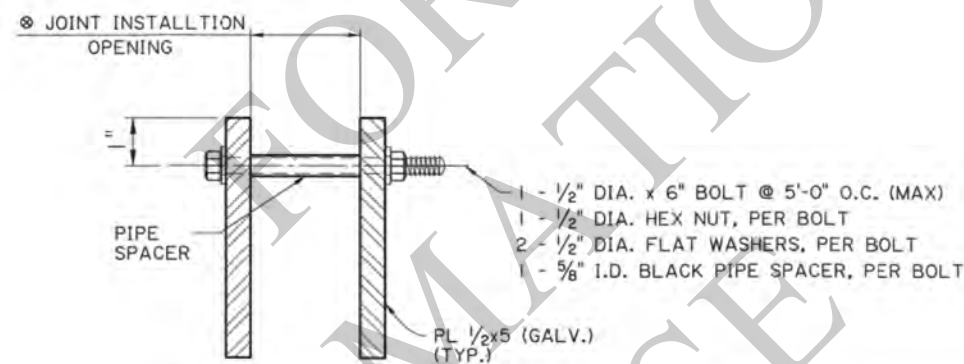
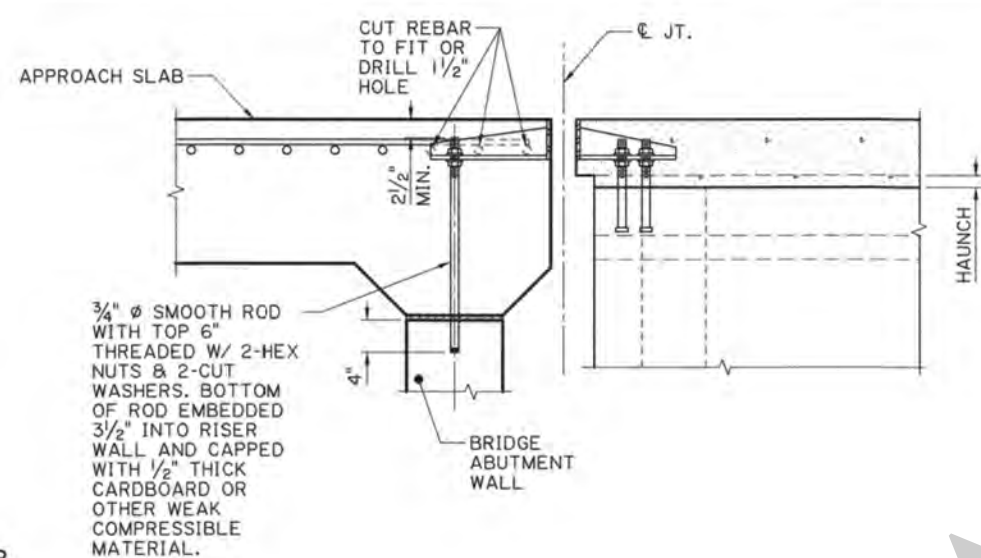
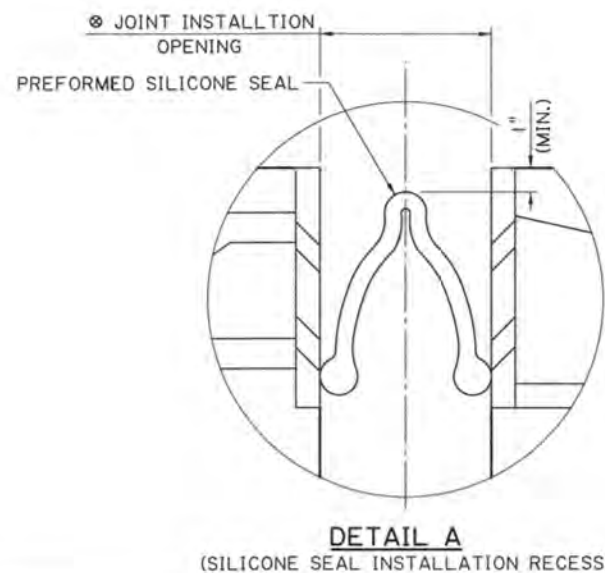
BRIDGE AND STRUCTURAL DESIGN



PREFORMED SILICONE SEAL DETAIL (PPC GIRDERS)
(N.T.S.)



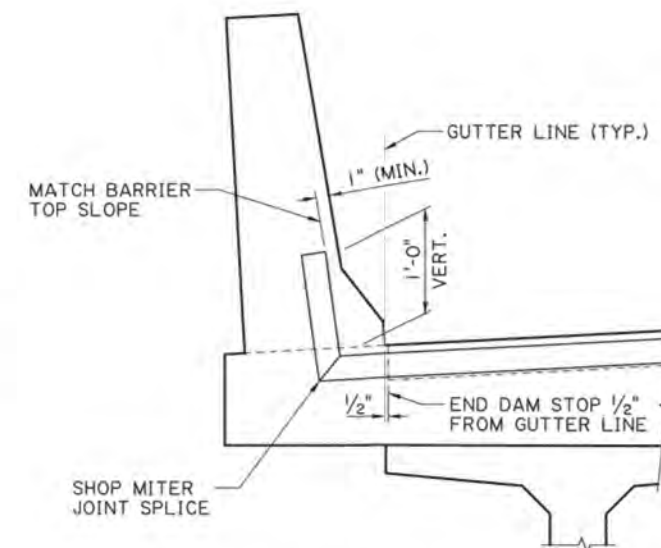
PREFORMED SILICONE SEAL DETAIL (STEEL GIRDERS)
(N.T.S.)



SILICONE SEAL AT GUTTER LINES
(HIGH SIDE AND LOW SIDE)

NOTES:

1. JOINT FABRICATION AND CONSTRUCTION SHALL BE IN ACCORDANCE WITH SECTION 815.
2. PROVIDE HOT-DIPPED GALVANIZED ANCHOR RODS AND ANCHOR BOLTS IN CONFORMANCE WITH SECTION 807.
3. THE MANUFACTURER'S RECOMMENDED CONSTRUCTION METHODS SHALL BE FOLLOWED.
4. THE SILICONE SEAL MANUFACTURER'S REPRESENTATIVE SHALL BE PRESENT DURING INITIAL SEAL INSTALLATION(S) UNTIL SUCH TIME AS THE PROJECT ENGINEER IS SATISFIED WITH SEAL INSTALLATION. AFTER INITIAL INSTALLATION, PROVIDE SEAL MANUFACTURER'S REPRESENTATIVE AS NEEDED UPON PROJECT ENGINEER'S REQUEST.
5. SUBMIT SHOP DRAWINGS IN ACCORDANCE WITH SECTION 801.
6. SHIP END DAMS IN ACCORDANCE WITH THESE DETAILS.
7. FOR WELDS, CONFORM TO SECTION 809.
8. JOINTS UP TO FIFTY-FOUR (54) FEET IN LENGTH SHALL BE DELIVERED TO THE JOB SITE IN ONE PIECE. JOINTS OVER FIFTY-FOUR (54) FEET IN LENGTH MAY HAVE PROVISIONS FOR A FIELD SPLICE IN THE END DAM, PROVIDED THE SPLICE IS PERFORMED IN SHOP-LIKE CONDITIONS IN THE PRESENCE OF THE DOTD FABRICATION INSPECTOR.
9. WELDED SPLICES IN END DAMS SHALL BE SHOP SPLICES. END DAM SECTIONS BETWEEN WELDED SHOP SPLICES SHALL NOT BE LESS THAN 15 FEET IN LENGTH, EXCEPT THAT ONE SECTION NO LESS THAN 4 FEET IN LENGTH WILL BE ALLOWED IN THE SHOULDER AREA IF REQUIRED TO MATCH ROADWAY CROSS SECTION. SPLICES SHALL BE OUTSIDE OF WHEEL PATHS. SEE WHEEL PATH LOCATIONS DETAIL.
- WELDED SPLICES SHALL BE BUTT WELDS. SHOW ALL SHOP AND FIELD SPLICE LOCATIONS IN THE SHOP DRAWINGS. SPLICE LOCATIONS MAY BE DESIGNATED WITH A +/- 6 INCH TOLERANCE.
10. BEND STUDS PRIOR TO WELDING. NO BENDING OF STUDS WILL BE ALLOWED AFTER WELDING EXCEPT AS REQUIRED FOR WELDING INSPECTION.
11. REPAIR DAMAGED GALVANIZED COATS IN ACCORDANCE WITH SECTION 811.
12. THE SILICONE SEAL AND LOCKING ADHESIVE SHALL CONFORM TO SECTION 1005.
13. SEE PROJECT PLAN JOINT DATA TABLE FOR DESIGN AND INSTALLATION REQUIREMENTS.
14. ANCHOR BOLTS IN GIRDER WILL BE PAID FOR AS PART OF THE GIRDER. ANCHOR RODS IN APPROACH SLAB SUPPORT WALL WILL BE PAID FOR UNDER THE STRUCTURAL METALWORK (ANCHOR BOLTS) PAY ITEM. MEASUREMENT AND PAYMENT OF OTHER END DAM AND SILICONE SEAL ELEMENTS WILL BE IN ACCORDANCE WITH SECTION 815.
15. JOINTS SHALL BE PAID FOR UNDER PAY ITEM SEALED EXPANSION JOINT (END DAMS AND PREFORMED SILICONE SEAL).



SHEET NUMBER		PARISH		CONTROL SECTION		STATE PROJECT	
DESIGN	ALANCASTER	CHECK	K. KEMP	DETAIL	ALANCASTER	CHECK	K. KEMP
REVIEW	Y. SHEN	SERIES	1 OF 2				

STATE OF LOUISIANA

ADAM LANCASTER

License No. 55573

PROFESSIONAL ENGINEER

CIVIL ENGINEERING

5/1/2021

APPROVED BY CHIEF ENGINEER:

Christy P. Hobbs

5/12/2021

DATE:

JOINT-SC

MISC. SPAN DETAILS

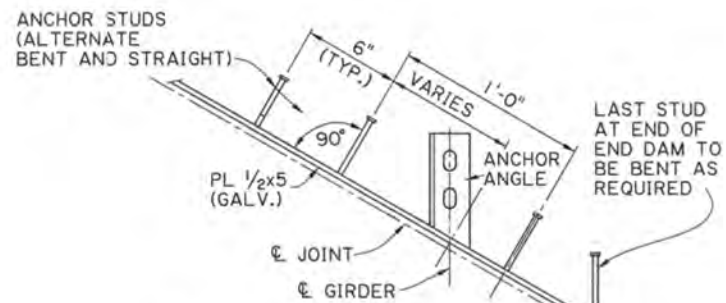
SEALED EXPANSION JOINT - END DAMS AND PREFORMED SILICONE

STANDARD P. 21

DOTD

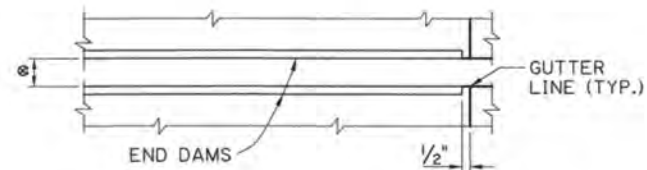
LOUISIANA DEPARTMENT OF TRANSPORTATION & DEVELOPMENT

BRIDGE AND STRUCTURAL DESIGN

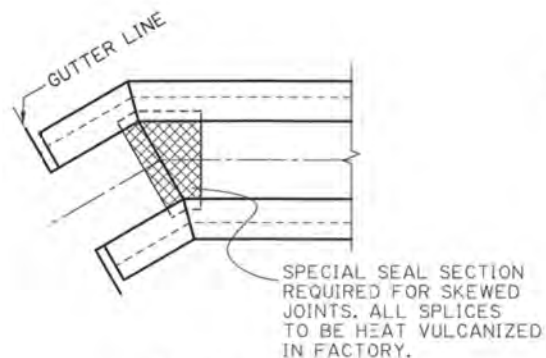


PARTIAL PLAN OF JOINT
(N.T.S.)

(SHOWING TYPICAL END DAM FOR SKEWED JOINT)



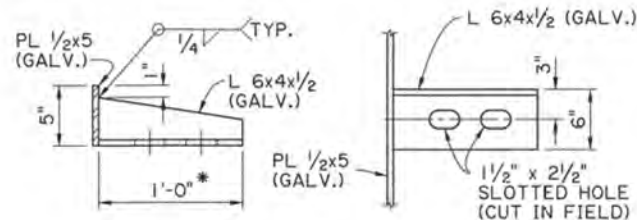
PARTIAL PLAN OF JOINT
(N.T.S.)



DETAIL A

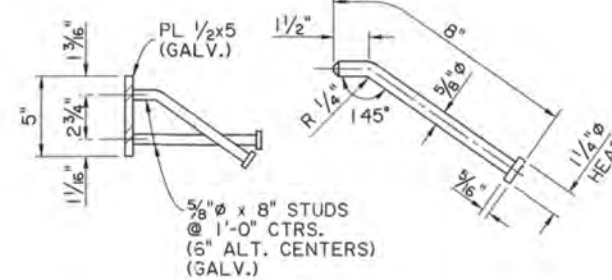
END DAM INSTALLATION PROCEDURE:

1. ONE END DAM STABILIZER (SEE END DAM STABILIZER DETAIL) IS REQUIRED IN EACH END DIAPHRAGM, EQUALLY SPACED BETWEEN GIRDERS, ON ONE SIDE OF THE JOINT ONLY. FOR CONCRETE GIRDER BRIDGE, CAST NO. 5 BARS "B" IN END DIAPHRAGM CONCRETE. FOR STEEL GIRDER BRIDGE, TACK WELD NO. 5 BARS "B" TO TOP MEMBER OF CROSS DIAPHRAGMS.
2. PLACE END DAM ASSEMBLY AS A UNIT, WITH PIPE SPACERS AND BOLTS IN PLACE.
3. ADJUST ASSEMBLY TO CORRECT VERTICAL POSITION AND JOINT INSTALLATION OPENING. TIGHTEN ONE SIDE INTO PLACE USING ANCHOR BOLTS IN GIRDERS. HAND TIGHTEN OPPOSITE SIDE.
4. LOOSELY TIE NO. 5 BARS "A" TO NO. 5 BARS "B" (END DAM STABILIZER).
5. TACK WELD NO. 5 BARS "A" TO END DAM PLATE.
6. WELD NO. 5 BARS "A" TO NO. 5 BARS "B".
7. TIGHTEN OPPOSITE SIDE OF END DAM ASSEMBLY ANCHORS JUST PRIOR TO DECK POUR.
8. CAST DECK.
9. CUT/REMOVE PIPE SPACER AND BOLT AS SOON AS CONCRETE WILL SUPPORT LOAD WITHOUT OVERSTRESSING OR DAMAGING CONCRETE, BUT NO LONGER THAN 8 HOURS AFTER DECK POUR.
10. REPAIR ANY DAMAGE TO EXPOSED GALVANIZATION.



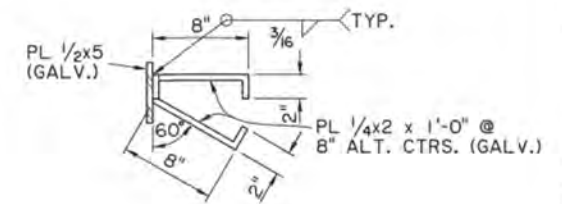
ANCHOR ANGLE
(N.T.S.)

* FOR APPROACH SLAB END DAMS IN A 6" SACRIFICIAL SECTION, USE L 6x4x1/2 x 1'-3"

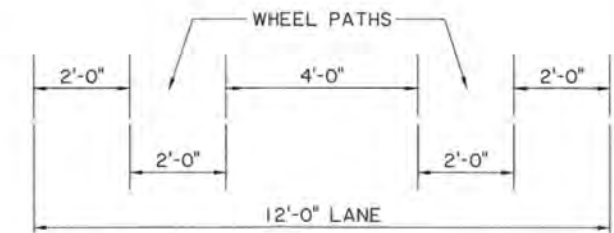


ANCHOR STUD
(N.T.S.)

ANCHOR STUDS SHALL BE 5/8" x 8" AUTOMATIC END WELDED TYPE. ALL BENDS ARE TO BE MADE PRIOR TO WELDING AND GALVANIZING.

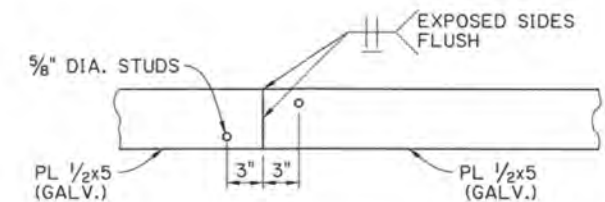


ANCHOR STRAP ALTERNATE
(N.T.S.)



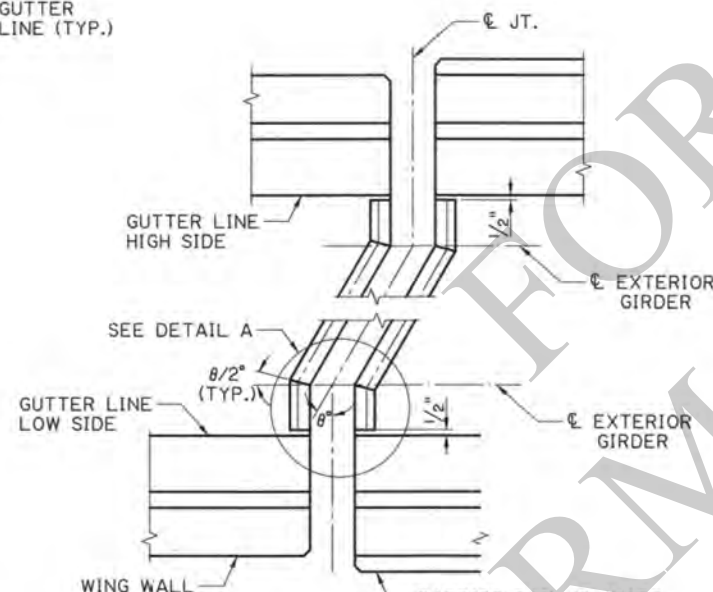
DIMENSIONS SHOWN ARE NORMAL TO DIRECTION OF TRAFFIC.

WHEEL PATH LOCATIONS

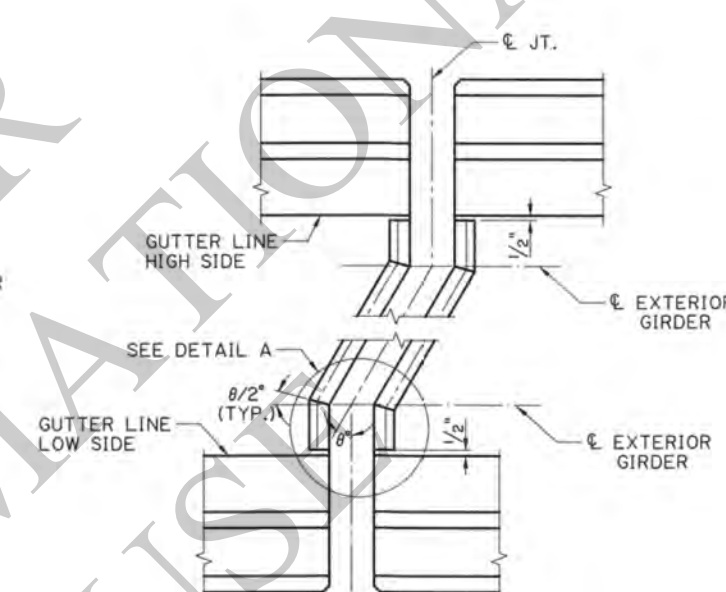


PERMISSIBLE END DAM SPLICE

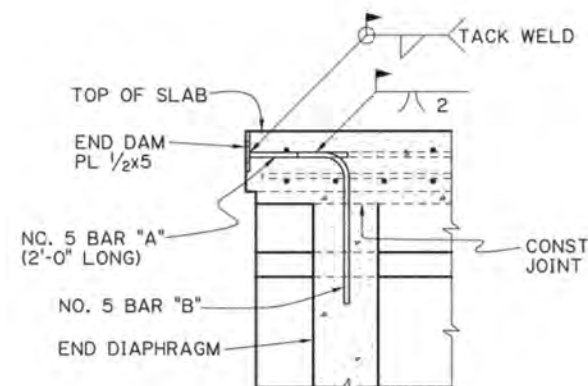
PL 1/2x5 TO HAVE A UNIVERSAL MILL FACE FINISH ON TOP, OR TOP EDGE IS TO BE FINISHED SMOOTH IF CUT TO MATCH CROWN OF ROADWAY.
(N.T.S.)



PART PLAN AT END BENTS
(SKEWED JOINT FOR GIRDER BRIDGES)

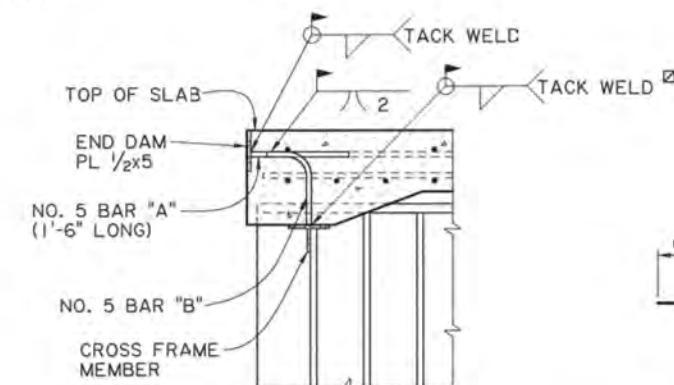


PART PLAN AT INTERMEDIATE BENTS
(SKEWED JOINT FOR GIRDER BRIDGES)



END DAM STABILIZER
(PARTIAL SECTION BETWEEN PPC GIRDERS)
(N.T.S.)

NO. 5 BAR "B"
(2 1/2" x PIN)



END DAM STABILIZER
(PARTIAL SECTION BETWEEN STEEL GIRDERS)
(N.T.S.)

NO. 5 BAR "B"
(2 1/2" x PIN)

FOR WELDING BAR "B" TO CROSS FRAME MEMBER, REMOVE CROSS FRAME MEMBER PROTECTIVE COATING SUFFICIENTLY TO PERMIT WELDING. DO NOT REMOVE COATING WITHIN 2 INCHES OF EDGE OF CROSS FRAME MEMBER FLANGE.

SHEET NUMBER		PARISH		CONTROL SECTION		STATE PROJECT	
ALANCASTER		K. KEMP		ALANCASTER		Y. SHEN	
DESIGN		CHECK		DETAIL		REVIEW	
SERIES 12 OF 2							

ADAM LANCASTER
License No. 35573
PROFESSIONAL ENGINEER
IN
CIVIL ENGINEERING
5/1/2021

APPROVED BY CHIEF ENGINEER:
5/12/2021

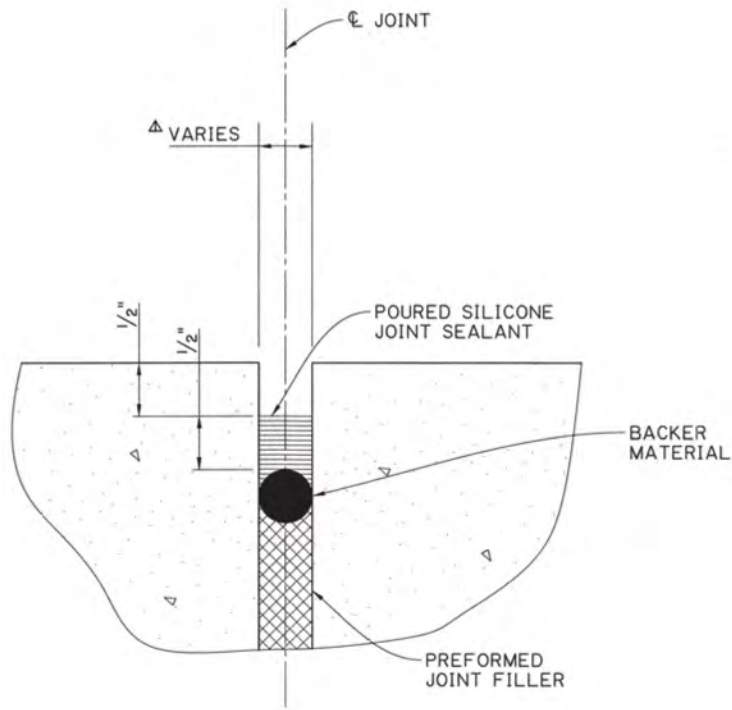
MISC. SPAN DETAILS

SEALED EXPANSION JOINT - END DAMS AND PREFORMED SILICONE

JOINT-SC

STANDARD PLAN

DOTD
LOUISIANA DEPARTMENT OF TRANSPORTATION & DEVELOPMENT
BRIDGE AND STRUCTURAL DESIGN



POURED SILICONE JOINT - SECTION
(N.T.S.)

NOTES:

- 1. JOINT FABRICATION AND CONSTRUCTION SHALL BE IN ACCORDANCE WITH SECTION 815.
- 2. THE MANUFACTURER'S RECOMMENDED CONSTRUCTION METHODS SHALL BE FOLLOWED.
- 3. PREFORMED JOINT FILLER SHALL CONFORM TO SECTION 1005.
- 4. POURED SILICONE JOINT SEALANT AND BACKER MATERIAL SHALL CONFORM TO SECTION 1005. THE BACKER MATERIAL SHALL BE COMPRESSED TO 80% OR LESS OF ITS ORIGINAL DIAMETER FOR INSTALLATION.
- 5. SEE THE JOINT DATA TABLE IN PLANS FOR DESIGN AND INSTALLATION REQUIREMENTS.
- 6. JOINT WILL BE PAID FOR UNDER PAY ITEM JOINT SEAL (POURED).

FOR INFORMATIONAL USE

SHEET NUMBER		PARISH		CONTROL SECTION		STATE PROJECT	
ALANCASTER		K. KEMP		J. W. P.		Y. SHEN	
DESIGN CHECK		DETAIL CHECK		REVIEW		SERIES	
1		1		1		1	

STATE OF LOUISIANA

ADAM LANCASTER

License No. 35573

PROFESSIONAL ENGINEER

IN

CIVIL ENGINEERING

Adam Lancaster

5/14/2021

APPROVED BY CHIEF ENGINEER:

Christopher P. Kelly

5/12/2021

DATE:

STATE OF LOUISIANA

DEPARTMENT OF TRANSPORTATION & DEVELOPMENT

MISC. SPAN DETAILS

POURED SILICONE JOINT

STANDARD PLAN

JOINT-SC-P

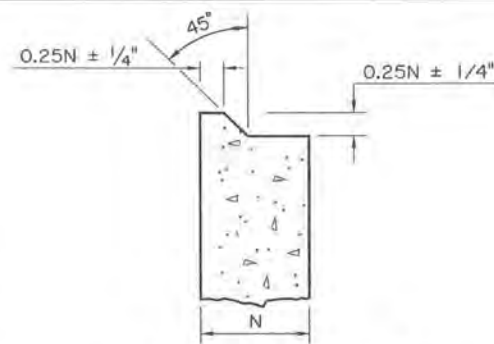
DOTD

LOUISIANA DEPARTMENT OF TRANSPORTATION & DEVELOPMENT

BRIDGE AND STRUCTURAL DESIGN

GENERAL NOTES:

- THIS STRUCTURE MEETS ALL DOTD HYDRAULIC PERFORMANCE CRITERIA WHEN USED IN ACCORDANCE WITH THE DOTD HYDRAULICS MANUAL AND ALL DOTD HYDRAULIC DESIGN POLICIES.
- PROVIDE PRECAST UNITS AS THE LOWER PORTION OF A COMPOSITE STRUCTURE. PROVIDE CAST-IN-PLACE CONCRETE (SEE APPROPRIATE STANDARD PLAN FOR REQUIRED REINFORCING AND DIMENSIONS) FOR THE TOP 1'-6" OF THE STRUCTURE AS FOLLOWS:
 - CB-01, CB-02, CB-04, CB-05, AND MANHOLES MAY BE FULLY PRECAST IF THE STRUCTURES ARE NOT EXPOSED TO TRAFFIC LOADS; ELEVATIONS MUST BE FIELD VERIFIED PRIOR TO FABRICATION.
 - CB-06, CB-07, CB-08, AND CB-09 STRUCTURES MUST HAVE THE TOP 18" CAST-IN-PLACE; ELEVATIONS MUST BE FIELD VERIFIED PRIOR TO FABRICATION.
- DESIGN IS TO BE IN ACCORDANCE WITH THE AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS, EIGHTH EDITION, 2017, AND THE LATEST LOUISIANA STANDARD SPECIFICATIONS FOR ROADS AND BRIDGES.
- FINISH CAST-IN-PLACE CONCRETE IN ACCORDANCE WITH OTHER STANDARD PLANS AND 805.
- FORM PIPE OPENINGS ONLY AS REQUIRED FOR INTERSECTING PIPES. PROVIDE OPENING DIMENSIONS TO ACCOMMODATE PIPE DIAMETER AND SKEW ANGLE. PROVIDE OPENING DIMENSION THAT IS 4 1/2 INCH LARGER THAN OUTSIDE PIPE DIMENSION.
- RESILIENT CONNECTORS OR CONCRETE COLLARS ARE REQUIRED FOR CONNECTIONS OF ALL PIPE SIZES (EXCEPT YARD DRAIN PIPE AND UNDERDRAINS) WITH COST TO BE INCLUDED IN THE COST OF THE PRECAST STRUCTURE.



JOINT DETAIL A
PRECAST/PRECAST

1. SEAL AND WRAP JOINT IN ACCORDANCE WITH 702.04.01

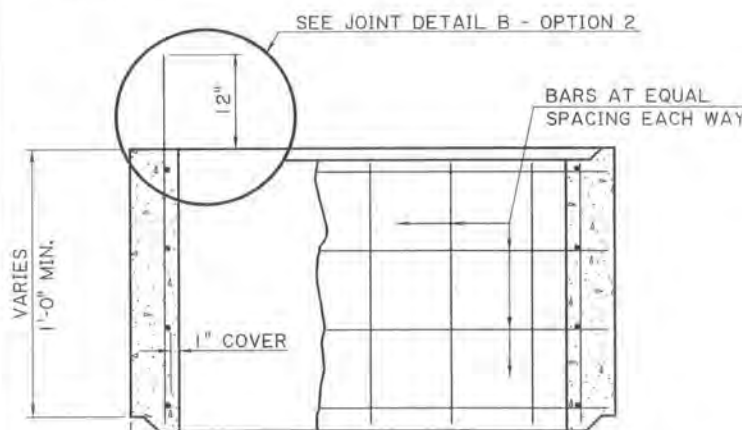
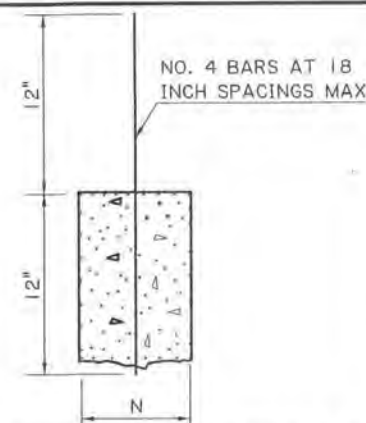
USE DIMENSIONS FROM JOINT DETAIL "A"



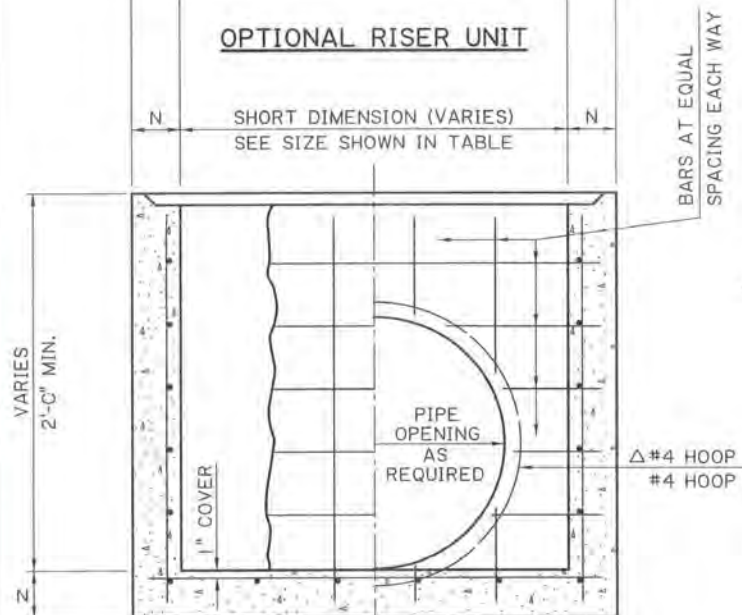
JOINT DETAIL B - OPTION 1
CAST-IN-PLACE/PRECAST

JOINT DETAIL B - OPTION 2
CAST-IN-PLACE/PRECAST

IN OPTIONS 1 AND 2, COAT PRECAST CONCRETE JOINT SURFACE AND A MAXIMUM OF 2 INCHES OF REINFORCING STEEL WITH TYPE V, GRADE 2 OR GRADE 3 EPOXY RESIN CONFORMING TO 1017. APPLY EPOXY RESIN AND PLACE CONCRETE IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS.



OPTIONAL RISER UNIT



BASE UNIT
SECTION B-B

Δ #4 HOOP MAY BE USED WHEN PIPE IS CIRCULAR AND CONNECTS TO THE CATCH BASIN AT +/- 90 (DEGREE) ANGLE. #4 HOOP (ALT.) SHALL BE USED FOR NON-CIRCULAR (ELLIPTICAL) PIPES AND ALL PIPES THAT ENTER THE CATCH BASIN AT A SKEWED ANGLE.

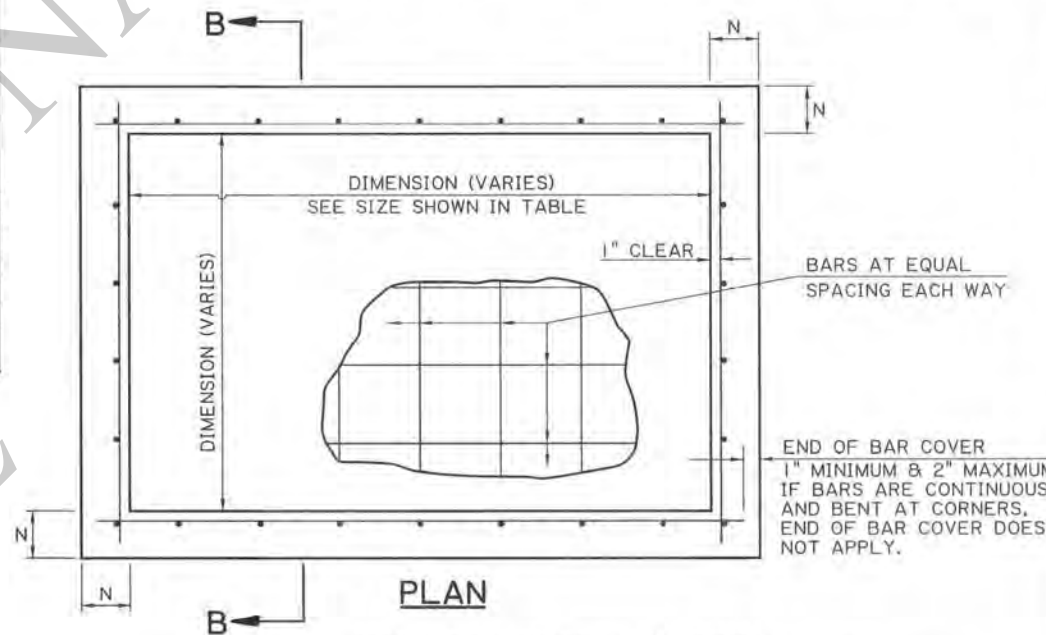
PIPE OPENING SHORT AXIS +8"



PIPE CONNECTION DETAIL

PRECAST UNITS FOR CATCH BASINS & MANHOLES													
MAXIMUM HEIGHT	N	4' MAX. DIMENSION				6' MAX. DIMENSION				8' MAX. DIMENSION			
		TYPICAL SIZES 3'X3' 4'X4'				TYPICAL SIZES 6'X4' 6'X6'				TYPICAL SIZES 8'X4' 8'X6' 8'X8'			
FT.	IN.	BAR SIZE	SPAC.*	As	IN ² /FT.	BAR SIZE	SPAC.*	As	IN ² /FT.	BAR SIZE	SPAC.*	As	IN ² /FT.
8	4	4	6	0.40		4	6	0.30		4	5.5	0.44	
8	6	4	9	0.27		4	6	0.40		5	5	0.74	
14	6	4	9	0.27		4	6	0.40		5	5	0.74	
20	6	4	7	0.34		4	4.5	0.53		5	3.25	1.14	

OTHER SIZES ARE ACCEPTABLE AS LONG AS THE DIMENSIONS DO NOT EXCEED THE MAXIMUM DIMENSIONS.
* BAR SPACING APPLIES TO BOTH DIRECTIONS AND AT ALL LOCATIONS.
BAR SIZES AND SPACING MAY DIFFER FROM VALUES SHOWN, BUT THE AREA OF STEEL (A_s) SHALL BE EQUAL TO OR GREATER THAN VALUE SHOWN, AND BAR SPACING SHALL NOT EXCEED 1.5 TIMES THE WALL THICKNESS. THE AREA OF STEEL (A_s) MAY BE PROVIDED WITH STEEL DEFORMED WELDED WIRE FABRIC.



PLAN

CAST-IN-PLACE SECTION 1'-6" MINIMUM (SEE NOTE 2)

JOINT DETAIL "B" JOINT BETWEEN CAST-IN-PLACE AND PRECAST

OPTIONAL RISER UNIT

BASE UNIT

PIPE DIAM.

JOINT DETAIL "A" JOINT BETWEEN PRECAST UNIT

ADJUST FLOWLINE OF BASE UNIT WITH CLASS "R" CONCRETE

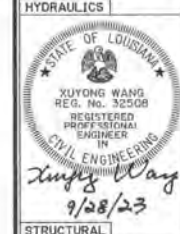
FLOWLINE OF PIPE TO BE AS SHOWN ON PLAN/PROFILE SHEETS

CONCRETE COLLAR CLASS "R" CONCRETE OR RESILIENT CONNECTOR

PRECAST CATCH BASIN OR MANHOLE

ELEVATION

TYPICAL COMPOSITE STRUCTURE



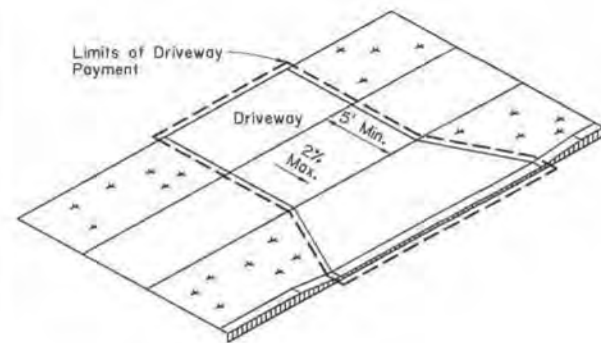
APPROVED BY CHIEF ENGINEER:  DATE: 10-2-2023



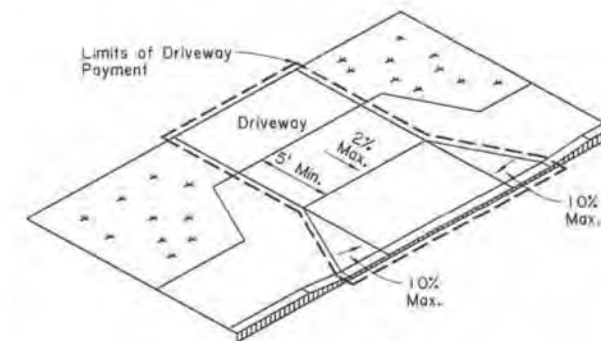
PRECAST CATCH BASINS AND MANHOLES



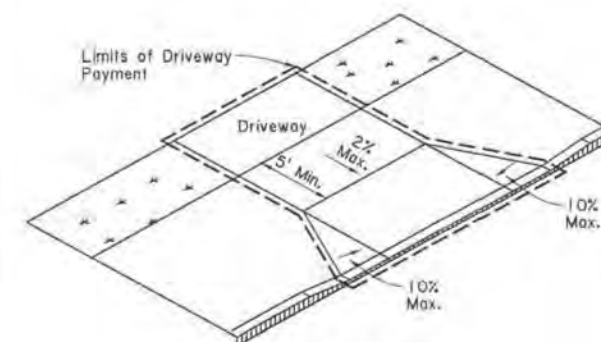
HYDRAULICS SECTION



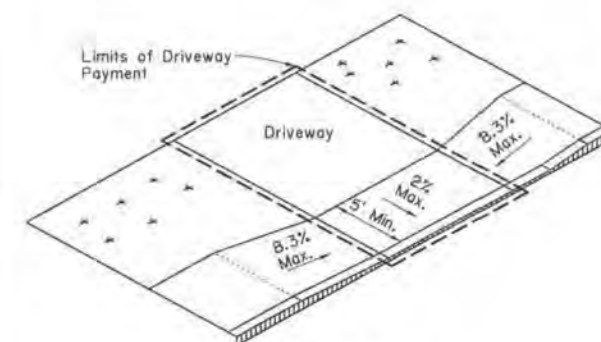
SETBACK SIDEWALK



APRON OFFSET SIDEWALK

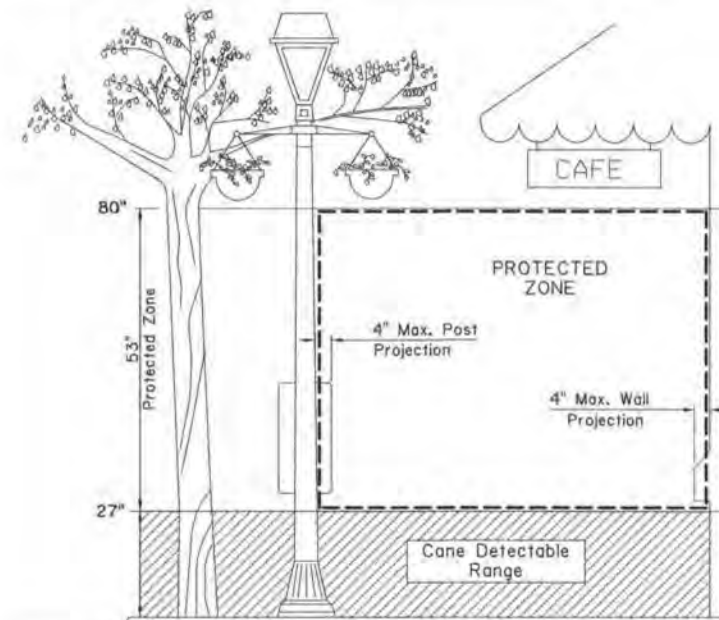


WIDE SIDEWALK



RAMP SIDEWALK

SIDEWALK TREATMENT AT DRIVEWAYS Refer to Driveway Standard Plans for further details.



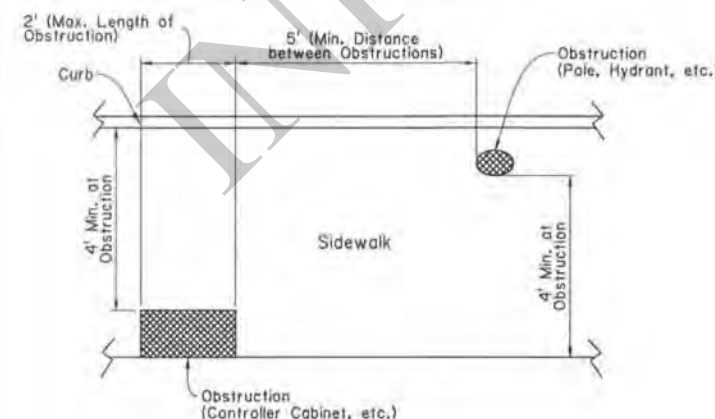
PROTECTED ZONE

Notes:

1. In pedestrian circulation area, maximum 4" projection for post or wall mounted objects between 27" and 80" above the surface.
2. When an obstruction of a height greater than 27" from the surface would create a protrusion of more than 4" into the pedestrian circulation area, construct additional curb or foundation at the bottom to provide a maximum 4" overhang.
3. Protruding objects of a height less than 27" are detectable by cane and do not require additional treatment.



CLEAR GROUND SPACE ADJACENT TO PEDESTRIAN PUSH BUTTON
Minimum 4' x 4' clear space required at public use fixtures.



PLAN VIEW
PLACEMENT OF OBSTRUCTIONS
Items not intended for public use.

PEDESTRIAN FACILITIES GENERAL NOTES

Curb Ramps

1. Maximum allowable cross slope of curb ramp surfaces is 2%; desired cross slope is 1.5%.
2. Theoretical pay areas for curb ramps are as shown on sheet 2, unless otherwise noted in the plans. These areas may be field adjusted as approved by the Project Engineer.
3. Grade breaks at the top and bottom of curb ramps runs shall be perpendicular to the direction of the ramp run.
4. Where curb ramps are located adjacent to a walking surface, a flare must be provided; otherwise a curb may be provided. For an example, refer to curb ramp Type 2 on sheet 2.
5. The landing dimensions are 5'x5' with a maximum 2% slope in any direction. The landing clear width shall be at least as wide as the widest ramp run leading to the landing.
6. Small raised channelization islands, which cannot provide a minimum of 5'x5' landing at the top of ramps, shall be cut through level with the surface of the street.
7. Raised medians should be 6' wide in the direction of pedestrian travel to serve as a pedestrian refuge area. Medians with pedestrian access routes through them shall be designed in accordance with Draft PROWAG.
8. Maneuvering space at the bottom of curb ramps shall be a minimum of 4'x4' completely contained within the crosswalk and completely outside the parallel vehicle travel lane.
9. It is desirable to provide a no-parking zone 50' from crosswalks on each intersection approach or provide a curb extension.
10. Drainage structures should be located on the upstream side of the ramp and located to prevent ponding near the curb ramp. Drainage structures should be placed outside the crosswalk.
11. Slopes of adjoining gutters and roadway surfaces immediately adjacent to the curb ramp shall not exceed 5%. Refer to the Transition from the Curb Ramp to Roadway Detail on sheet 1.
12. Curb ramps should be aligned with the direction of pedestrian travel on the crosswalk or theoretical crosswalk. Refer to sheet 3 for typical crossing layouts and refer to the pavement marking standards for crosswalk markings.
13. Crosswalk markings shall be placed a distance of 24" from the flare on each side of a diagonal curb ramp. Refer to sheet 3 for an example.
14. Curb ramps shall include detectable warning surfaces. Refer to sheet 4 for details of detectable warning surfaces.
15. Where a curb ramp is constructed within existing curb, curb and gutter and/or sidewalk, the existing curb or curb and gutter shall be removed to the nearest joint beyond the curb transition or the extent that no remaining section of curb or curb and gutter is less than 5' long or as directed by the Project Engineer. Existing sidewalks shall be removed to the nearest joint beyond the flare slope or to the extent that no remaining section of sidewalk is less than 5' long or as directed by the Project Engineer.

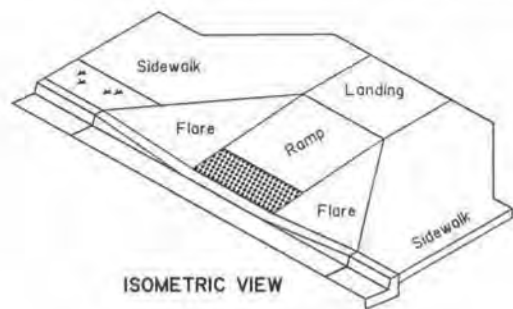
Sidewalks

1. Where a 5' sidewalk cannot be provided due to site constraints, 5'x5' passing areas at intervals not to exceed 200' are required.
2. Where sidewalks and crosswalks are contained within street or highway right-of-way, the grade of the sidewalk or crosswalk shall not exceed the grade of the adjacent street or highway. Where sidewalks are not contained within a street or highway right-of-way, the grade of the sidewalk shall be 5% maximum.
3. Maximum allowable cross slope of sidewalk surfaces is 2%; desired cross slope is 1.5%.
4. Vertical surface discontinuities along a sidewalk shall be 1/2" maximum. Discontinuities between 1/4" and 1/2" shall be beveled at a 1:2 maximum slope.
5. Where sidewalks intersect with streets, detectable warning surfaces are required. Refer to sheet 4 for details of detectable warning surfaces.
6. Traffic signal or illumination poles, ground boxes, controller boxes, signs, drainage facilities and other items shall be placed so as not to obstruct the accessible route.
7. When a sidewalk crosses a driveway and exceeds the 2% maximum cross slope, the driveway or driveway portion shall be reconstructed to meet the 2% maximum cross slope requirement. Refer to driveway standard plans for driveway details.
8. Handrails are not required on sidewalks within highway right-of-way, unless site specific conditions, such as a vertical drop-off, dictate. Where handrails are provided, they must comply with ADAAG 505.
9. To prevent tracking of gravel onto the sidewalk, gravel driveways should be paved from the roadway edge to a point 10' behind the sidewalk or the right-of-way, whichever is less.

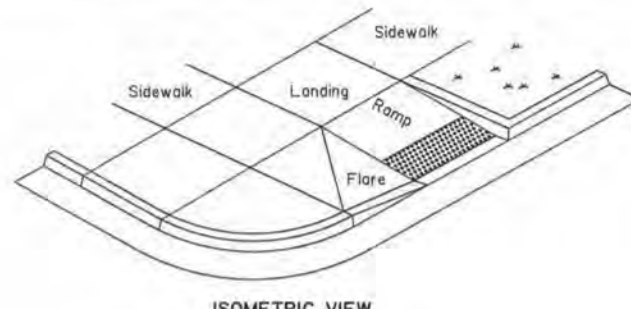
ADA - Americans with Disabilities Act
ADAAG - Americans with Disabilities Act Accessibility Guidelines
Draft PROWAG - Draft Public Rights-of-Way Accessibility Guidelines



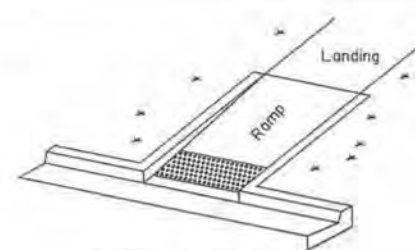
TRANSITION FROM CURB RAMP TO ROADWAY



ISOMETRIC VIEW



ISOMETRIC VIEW



ISOMETRIC VIEW

LEGEND OF PATTERNS

Denotes Non-Walking Surface
Not Part of Pedestrian Path

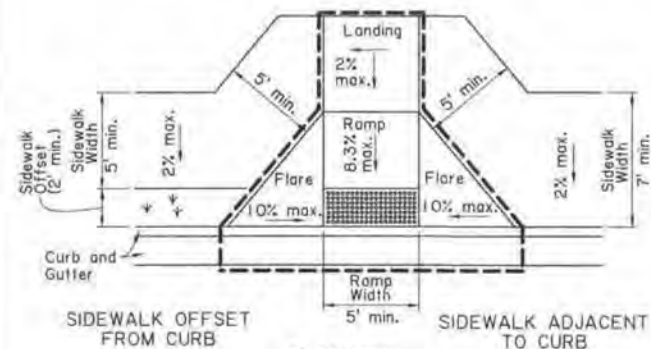
Detectable Warning Surface

Limits of Payment

Slope

All slopes shown are maximum allowable. The least possible slope that will drain properly should be used.

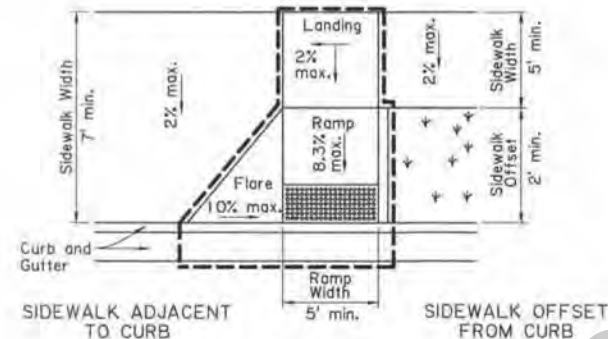
Curb ramps shall be placed and designed where ponding does not occur at the bottom or on the curb ramp.



PLAN VIEW

TYPE 1

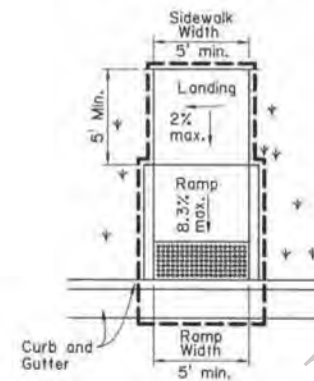
THEORETICAL PAY AREA = 12.8 SQ. YDS.



PLAN VIEW

TYPE 2

THEORETICAL PAY AREA = 10.4 SQ. YDS.

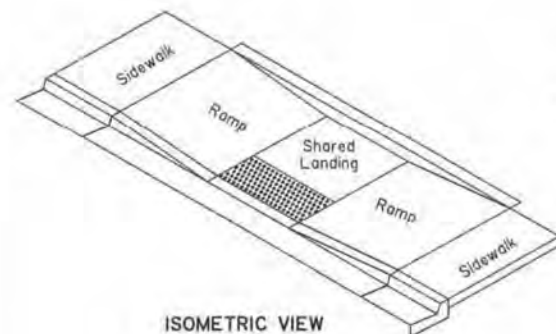


PLAN VIEW

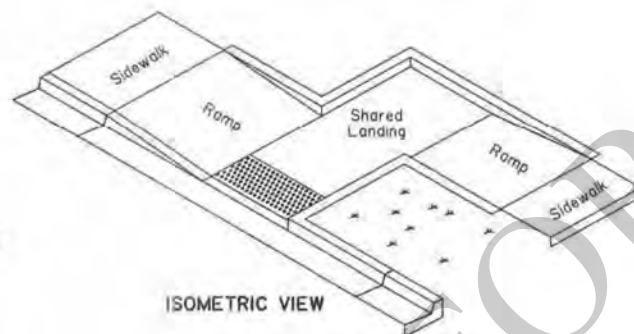
TYPE 3

THEORETICAL PAY AREA = 8.1 SQ. YDS.

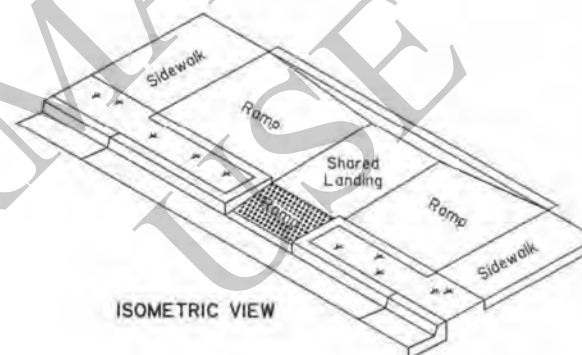
PERPENDICULAR CURB RAMPS
If a level landing of at least 3' cannot be provided, a perpendicular curb ramp should not be used.



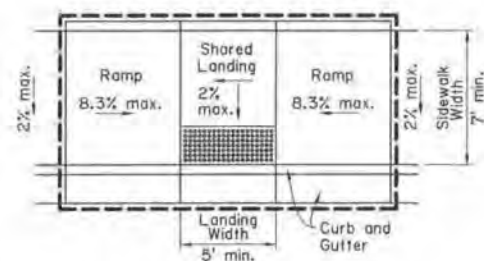
ISOMETRIC VIEW



ISOMETRIC VIEW



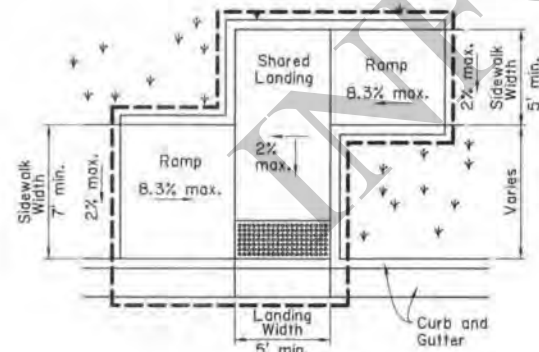
ISOMETRIC VIEW



PLAN VIEW

TYPE 4

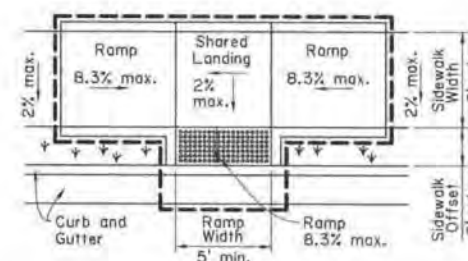
THEORETICAL PAY AREA = 17.9 SQ. YDS.



PLAN VIEW

TYPE 5

THEORETICAL PAY AREA = 19.1 SQ. YDS.



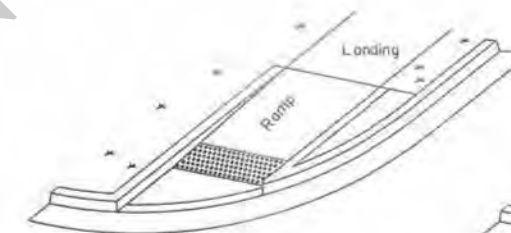
PLAN VIEW

TYPE 6

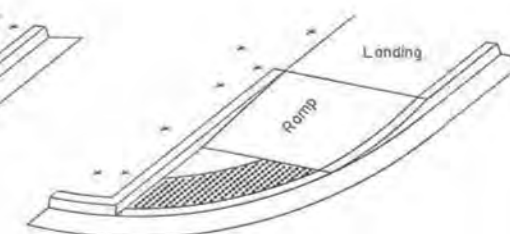
THEORETICAL PAY AREA = 13.7 SQ. YDS.

PARALLEL CURB RAMPS

COMBINATION CURB RAMP



ISOMETRIC VIEW



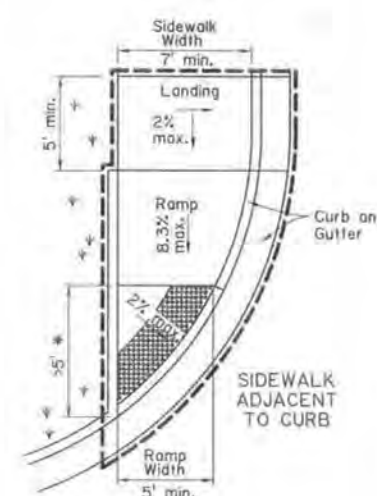
ISOMETRIC VIEW



PLAN VIEW

TYPE 7

THEORETICAL PAY AREA = 13.3 SQ. YDS.



PLAN VIEW

TYPE 8

THEORETICAL PAY AREA = 15.5 SQ. YDS.

DIRECTIONAL CURB RAMPS

Where the grade break is less than or equal to 5' from the back of curb, place detectable warning surface as shown in Type 7. Where grade break is greater than 5' from the back of the curb, place detectable warning surface as shown in Type 8.

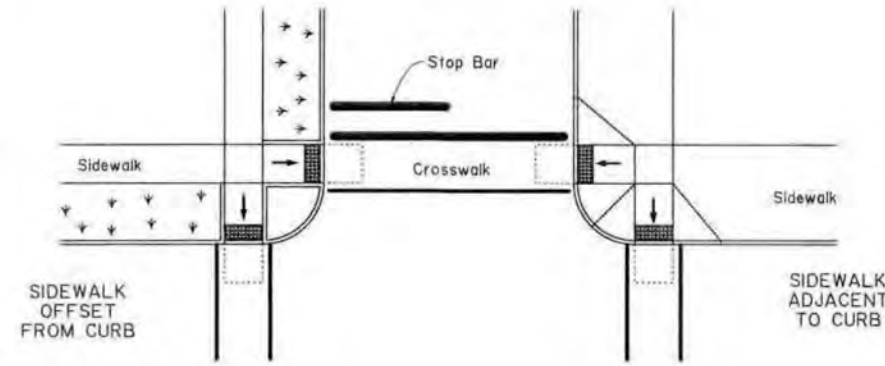
SHEET NUMBER		PARISH		CONTROL SECTION		STAFF PROJECT	
DESIGN		CHECK		DETAIL		CHECK	
MAL		BPW		MAL		BPW	
REVIEW		SERIES		2 OF 5			

STATE OF LOUISIANA
MELISSA LEBAS
LICENSE No. 23111
PROFESSIONAL ENGINEER
IN
CIVIL ENGINEERING
Melissa Lebas
7/14/2022

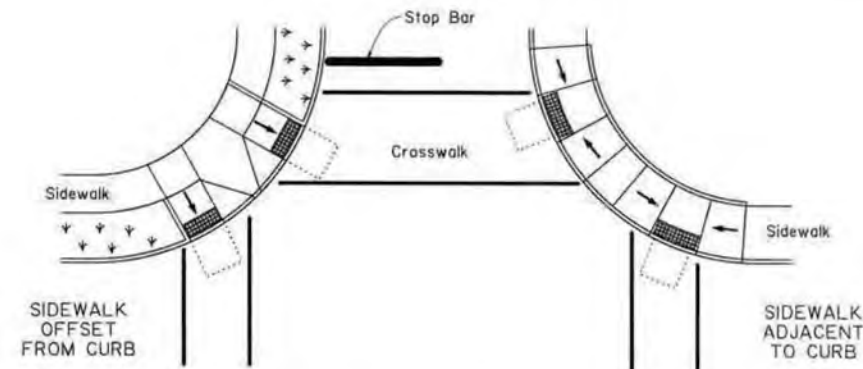
APPROVED BY CHIEF ENGINEER
DATE: 7/14/2022

STATE OF LOUISIANA
PEDESTRIAN FACILITIES
CURB RAMPS AND DETECTABLE
WARNING LOCATION
PED-01

DOTD
LOUISIANA DEPARTMENT OF
TRANSPORTATION & DEVELOPMENT
STANDARD
PLAN



DETAIL A: CURB RAMP PLACED OUTSIDE THE RADIUS OF A CURVE



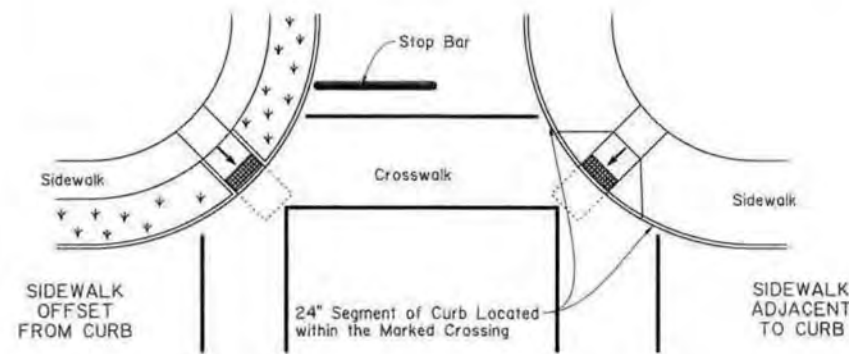
DETAIL B: PAIRED CURB RAMP PLACED WITHIN THE RADIUS OF A CURVE

GENERAL NOTES:

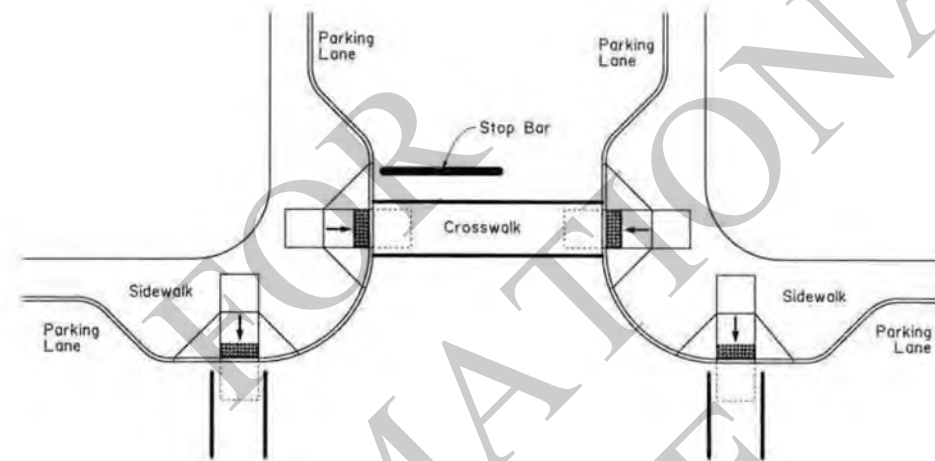
1. Curb ramps placed outside the radius of the curve are preferred. Paired curb ramps placed within the radius of a curve are acceptable. Single curb ramps placed on the apex of a curb should not be used unless site constraints, such as the location of drainage structures, require it.
2. Details and dimensions of curb ramps, sidewalks, and detectable warning surfaces are shown elsewhere.
3. Striping (crosswalks and stop bars) are shown for reference only. Refer to the pavement marking standard plans for striping details.

LEGEND

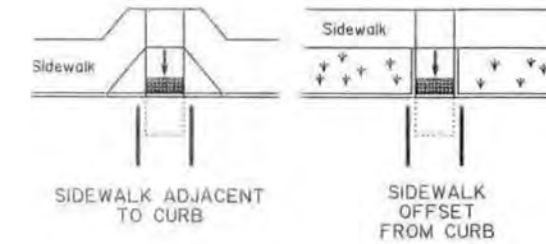
- Denotes non-walking surface not part of pedestrian path
- Detectable Warning Surface
- Maneuvering Space (4'x4' Min.)
- Ramp Surface



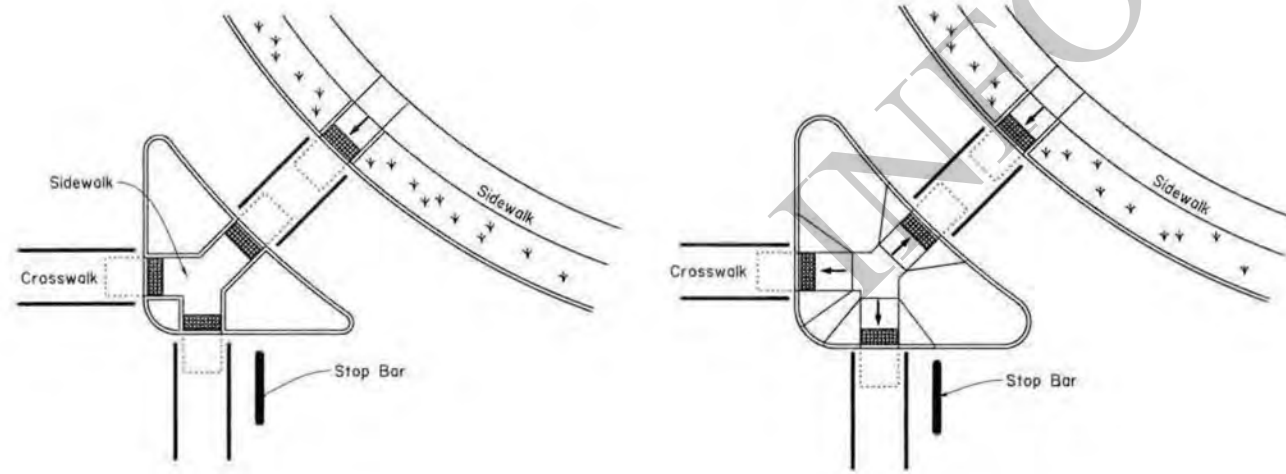
DETAIL C: SINGLE CURB RAMP PLACED ON APEX OF A CURVE (DIAGONAL CURB RAMP)



DETAIL D: CURB RAMP PLACED ON CURB EXTENSION (BULB-OUTS)



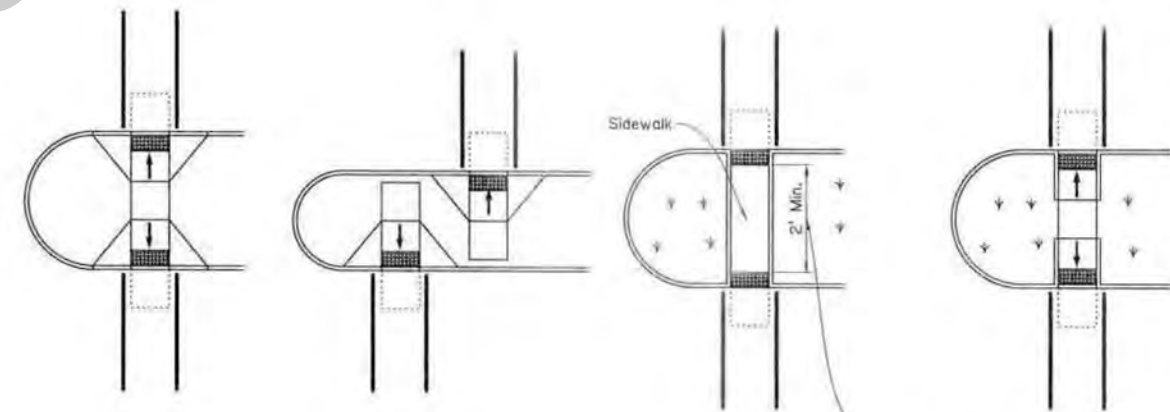
DETAIL E: CURB RAMP PLACED AT MID-BLOCK CROSSING



CUT-THROUGH ISLAND

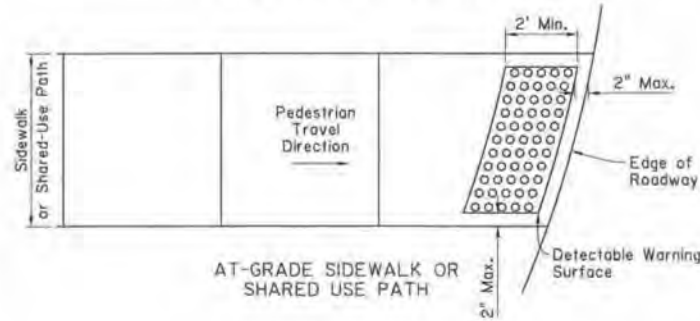
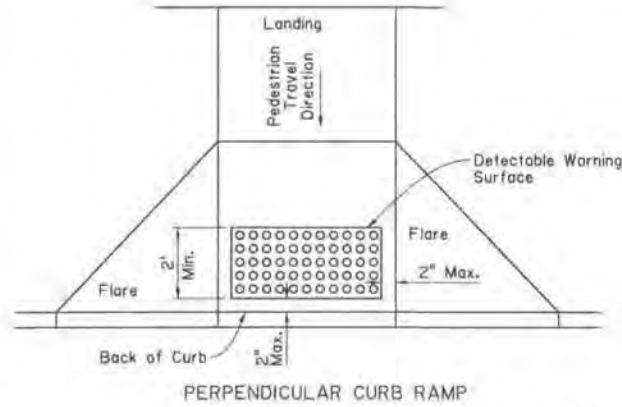
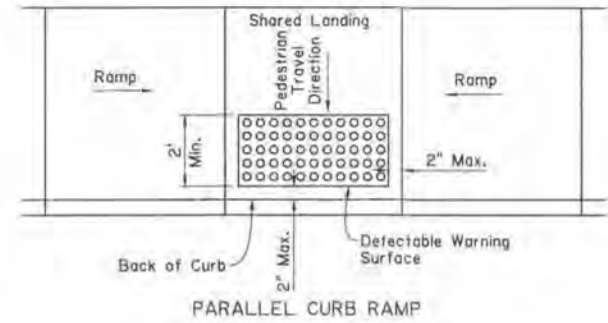
RAISED ISLAND

DETAIL F: SIDEWALKS AND CURB RAMP AT ISLANDS

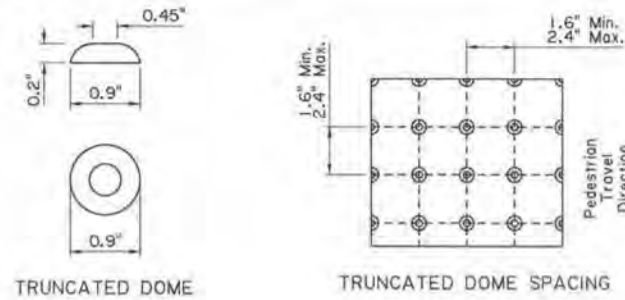


If 2' cannot be provided between detectable warning surfaces, detectable warning surfaces shall not be installed.

DETAIL G: SIDEWALKS AND CURB RAMP AT MEDIANS



TYPICAL PLACEMENT OF DETECTABLE WARNING SURFACE

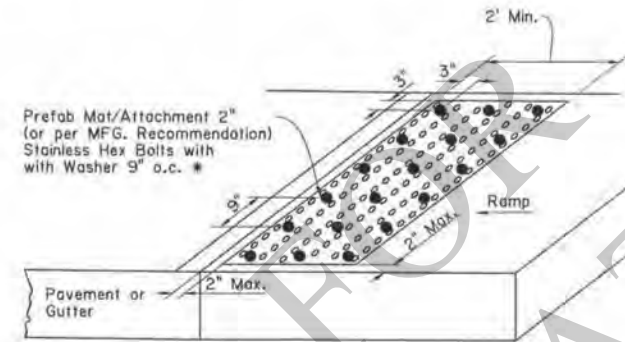


Notes:

Domes shall be arranged in a square in-line pattern or radial pattern

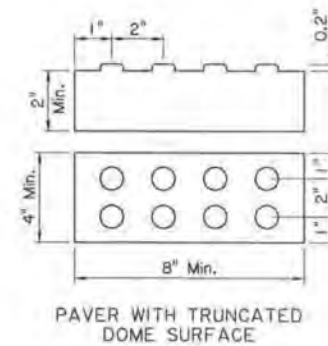
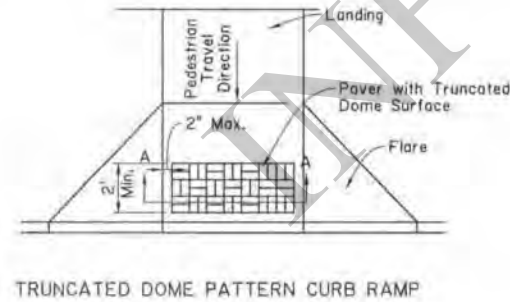
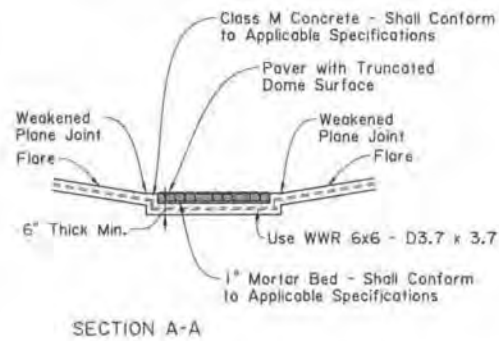
Color Fastness: Paver's composite coloring and ultra-violet stabilization must be homogeneous through the product.

TRUNCATED DOME DETAILS



*Note: Retrofit application placed on top of existing ramp with drilled and epoxied bolts. Epoxy full surface area per manufacturer's recommendation.

PREFABRICATED MAT OPTION (INLAID)

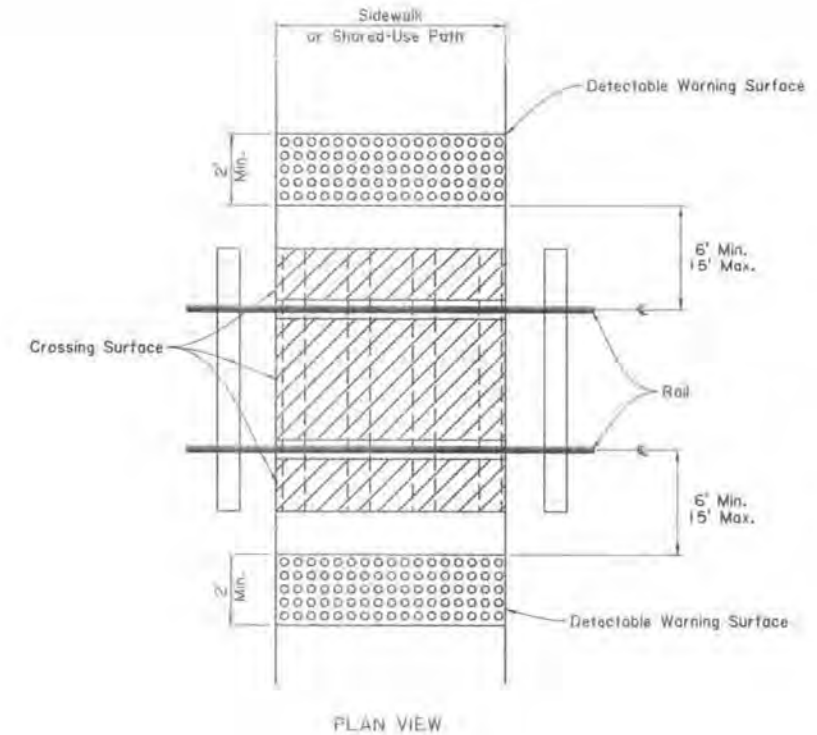


Notes: Paver units shall meet all requirements of the applicable ASTM Standards. Layout pattern shall be appropriate for size of paver used. 4"x8" pavers shall be laid out in a 2x2 basket weave pattern. 12"x12" pavers shall be laid out in a block pattern. Paver units shall be saw cut only and any cut unit shall not be less than 25% of a full unit. Installation should meet compliance with Draft PROWAG R302.7.2 (Vertical Surface Discontinuities). Vertical surface discontinuities shall be 1/2" maximum. Discontinuities between 1/4" and 1/2" shall be beveled at a 1:2 maximum slope.

DETECTABLE WARNING SURFACE
PAVER OPTION

GENERAL NOTES:

- For ADA compliance, detectable warning surfaces must be provided on all pedestrian curb ramps, medians and pedestrian refuge islands (width 6' or greater), railroad crossings and at-grade sidewalk and shared-use paths intersecting with roadways.
- Curb ramps must contain a detectable warning surface that consists of raised truncated domes complying with ADA guidelines. The surface must contrast visually with adjoining surfaces, including side flares, in accordance with Section 706 of the Standard Specifications. Color for detectable warning surface shall contrast visually with adjoining surfaces, either light-on-dark or dark-on-light.
- Detectable warning surfaces must be slip resistant and not allow water to accumulate.
- Truncated domes should be aligned perpendicular or radial to the grade break between the curb ramp or at-grade sidewalk and the street.
- Detectable warning surfaces shall be a minimum of 24" in depth in direction of pedestrian travel and extend the full width of the ramp run or landing where the pedestrian access route enters the street. Some detectable warning products may require a concrete border. The concrete border should not exceed 2".
- Detectable warning surfaces shall be placed at the back of curb or no greater than 5' from the back of curb. Detectable warning surfaces may be curved along the corner radius. Refer to sheet 2 for typical placement of detectable warning surfaces on curb ramp types.
- Detectable warning surfaces may be stamped, constructed of brick pavers or inlaid prefabricated mats attached by epoxy adhesive and mechanical attachment. Other detectable warning installations may be installed with approval from the Project Engineer, provided that the detectable warning surface meets ADA guidelines. No painted surfaces will be allowed.
- Any retrofit application of detectable warning surfaces must have beveled edges. The beveled edge shall not exceed a slope greater than 1:2.



LOCATION OF DETECTABLE WARNING SURFACES
AT RAILROAD CROSSINGS

Note: Rows of truncated domes should be aligned parallel with the direction of wheelchair travel.

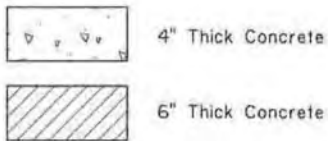
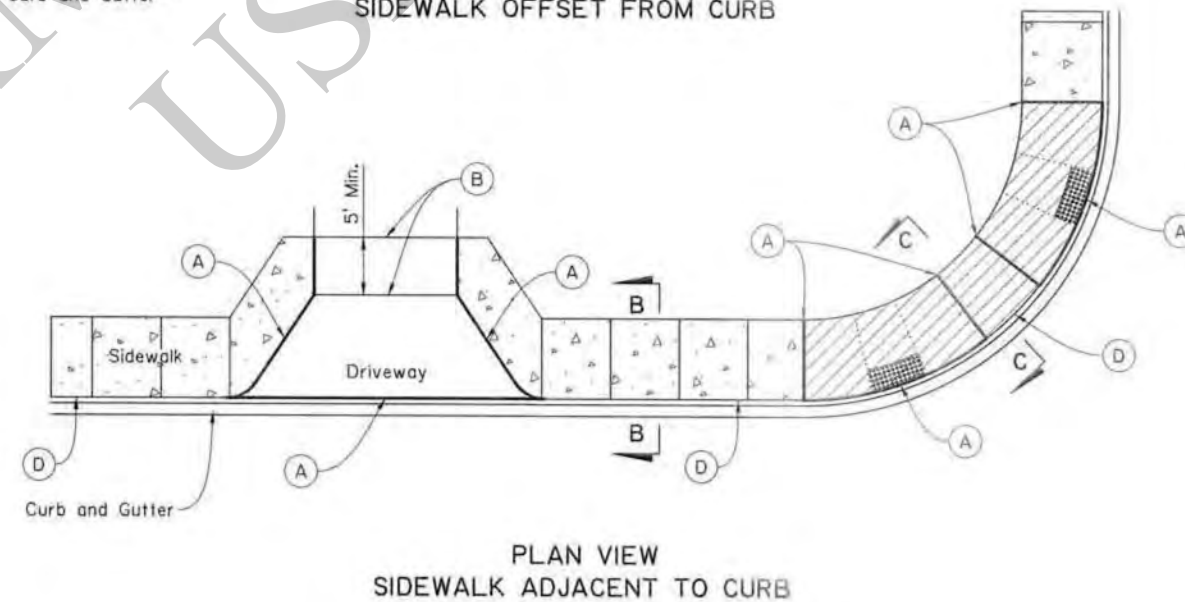
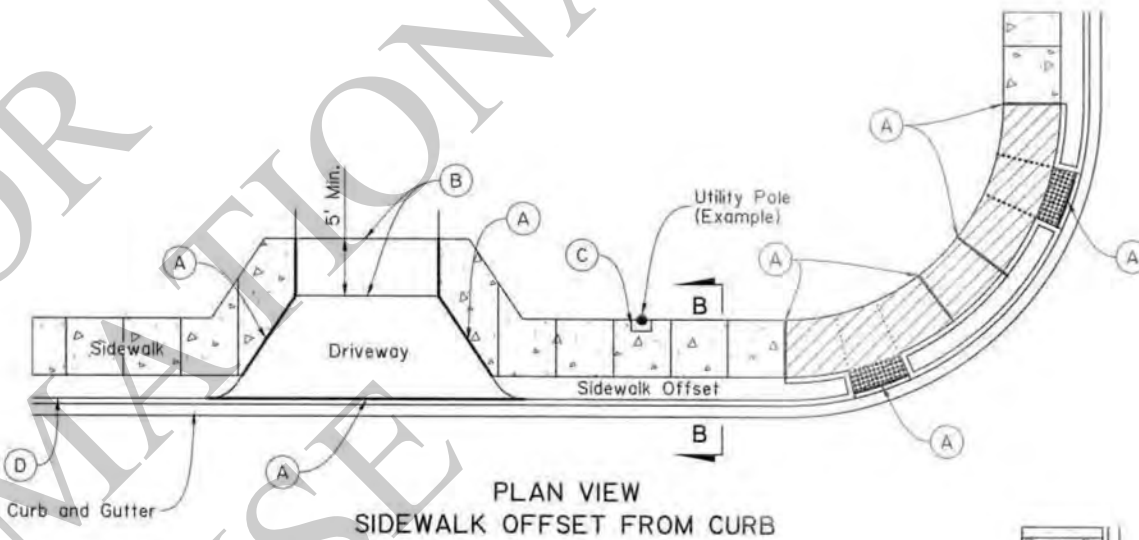
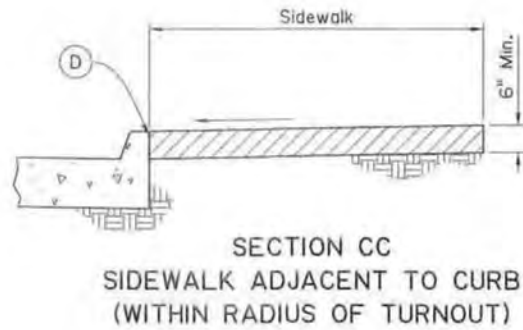
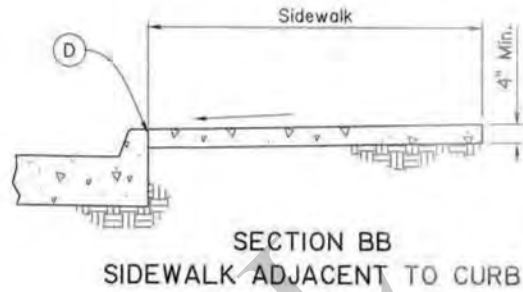
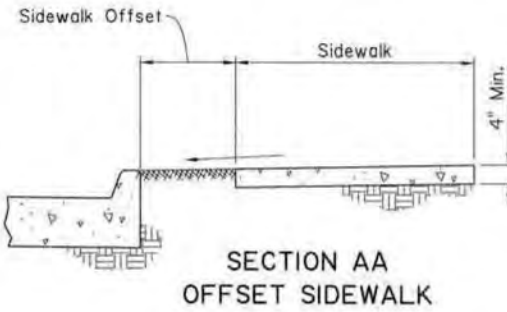
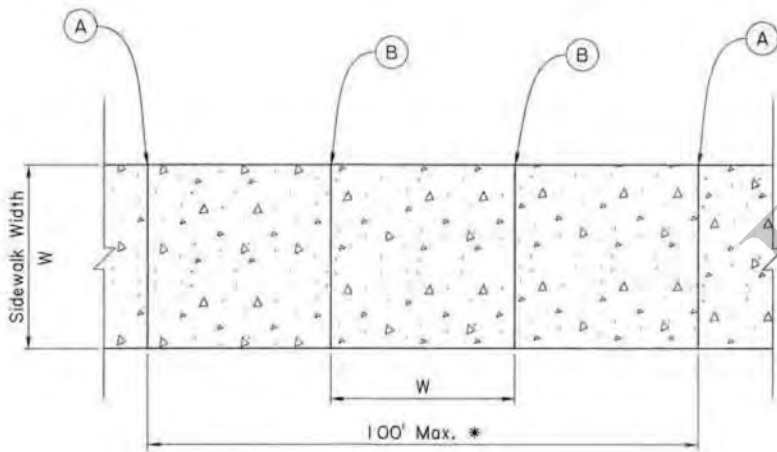
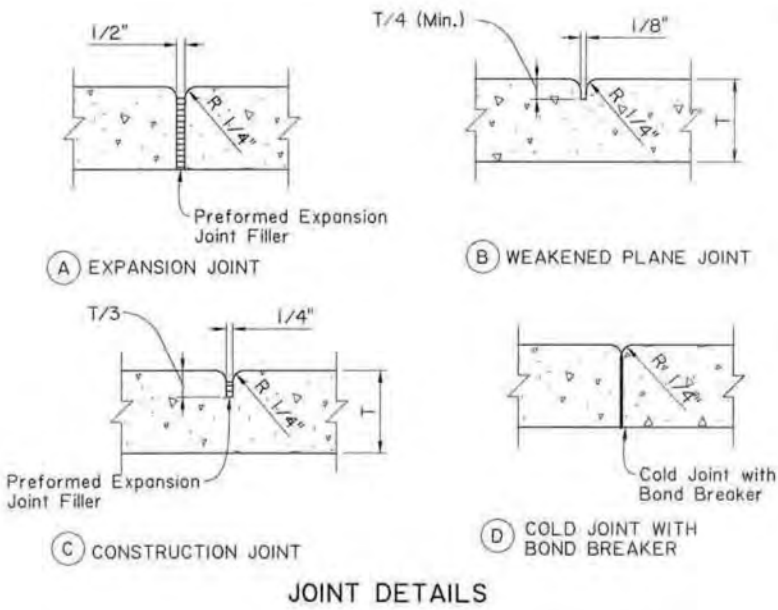
SHEET NUMBER		DATE	
DESIGN		REVIEW	
CHECK		APPROVED BY CHIEF ENGINEER	
MAL		DATE	
BPW		7/21/2022	
DETAIL		PEDESTRIAN FACILITIES DETECTABLE WARNING SURFACES	
BPW		PED-01	
SERIES # 4 OF 5		DOTD LOUISIANA DEPARTMENT OF TRANSPORTATION & DEVELOPMENT STANDARD PLAN	

GENERAL NOTES:

1. Weakened plane joints are required at all sidewalk ramps or driveways slope break lines.
2. Separate curb ramps and landing from adjacent sidewalk with preformed joint filler of 1/2".

JOINT LEGEND

- (A) 1/2" Expansion Joints (Preformed Joint Filler)
- (B) 1/8" Weakened Plane Joint
- (C) Construction Joint
- (D) Cold Joint with Bond Breaker



Note: Driveways and curb ramps are shown for reference only. Refer to the driveway standard plans and curb ramp sheet for details.

SHEET NUMBER		PARISH		CONTROL SECTION		STATE PROJECT	
MAL	BPW	MAL	BPW	SERIES # 5 OF 5			
DESIGN	CHECK	DETAIL	CHECK	REVIEW			

STATE OF LOUISIANA
MELISSA LEBAS
License No. 33111
PROFESSIONAL ENGINEER
IN
CIVIL ENGINEERING
Melissa Lebas
7/14/2022

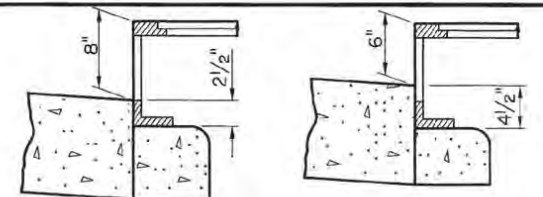
APPROVED BY CHIEF ENGINEER
[Signature]
DATE: 7/21/2022

STATE OF LOUISIANA
PEDESTRIAN FACILITIES
JOINT DETAILS
PED-01

DOTD
LOUISIANA DEPARTMENT OF
TRANSPORTATION & DEVELOPMENT
STANDARD
PLAN

GENERAL NOTES:

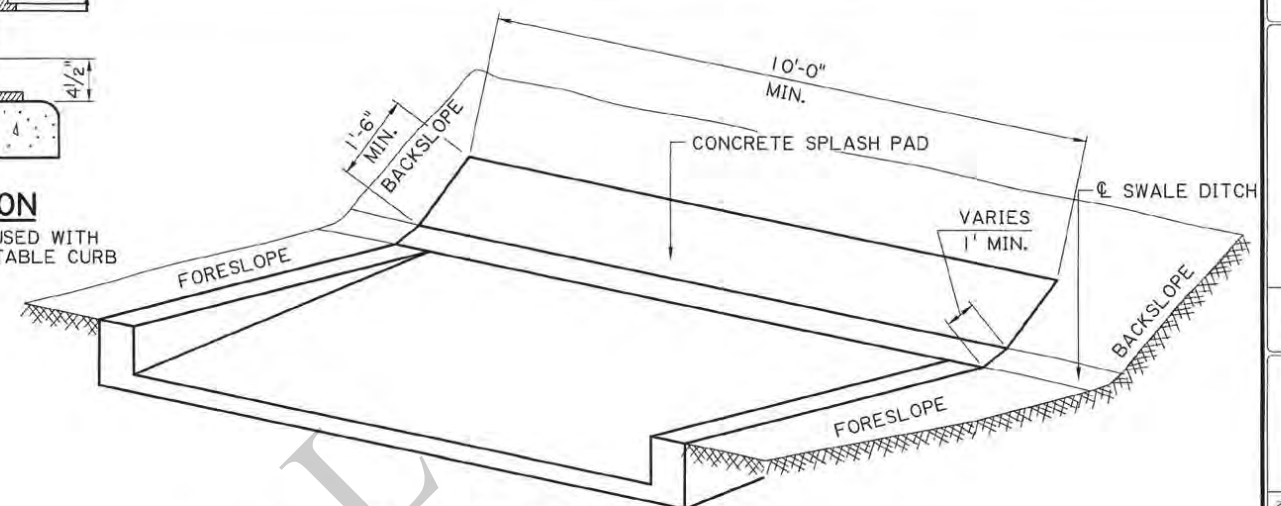
1. THIS STRUCTURE MEETS ALL DOTD HYDRAULIC PERFORMANCE CRITERIA WHEN USED IN ACCORDANCE WITH THE DOTD HYDRAULICS MANUAL AND ALL DOTD HYDRAULIC DESIGN POLICIES.
2. CONSTRUCTION SPECIFICATIONS: LATEST APPROVED LA DOTD STANDARD SPECIFICATIONS.
3. ALL EXPOSED CORNERS SHALL HAVE $\frac{3}{4}$ " CHAMFER UNLESS OTHERWISE NOTED.
4. DIMENSIONS RELATING TO REINFORCING STEEL FABRICATION ARE OUT-TO-OUT OF BARS AND DIMENSIONS RELATING TO REINFORCING STEEL SPACING ARE CENTER-TO-CENTER OF BARS.
5. REINFORCING STEEL SHALL HAVE 2" COVER UNLESS OTHERWISE SPECIFIED.
6. IF PRECAST CATCH BASIN IS USED, PLEASE REFER TO STANDARD PLAN PC-01 FOR DETAILS AND SPECIFICATIONS.
7. PAVED GUTTER DRAINS SHALL BE POURED MONOLITHICALLY.



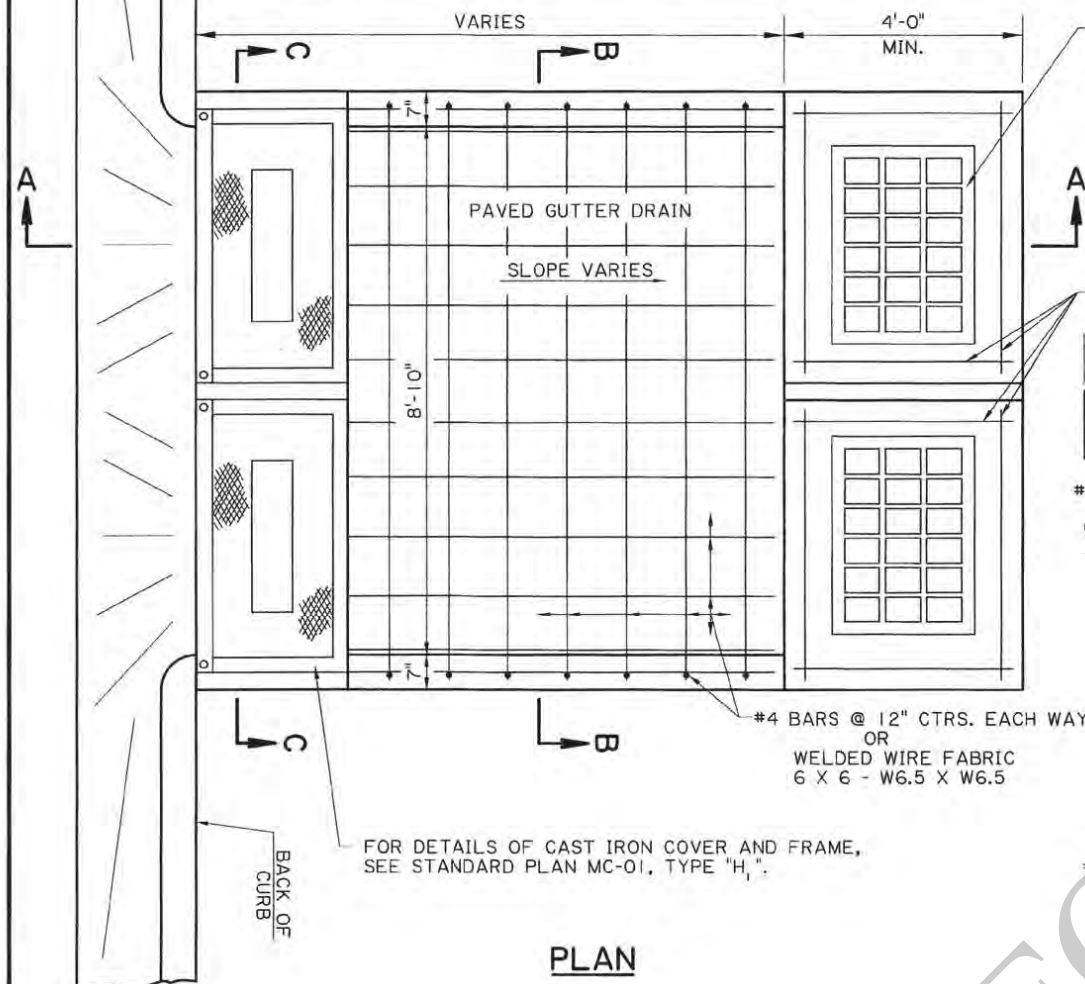
INLET CONFIGURATION

WHEN USED WITH
6" BARRIER CURB

WHEN USED WITH
4" MOUNTABLE CURB

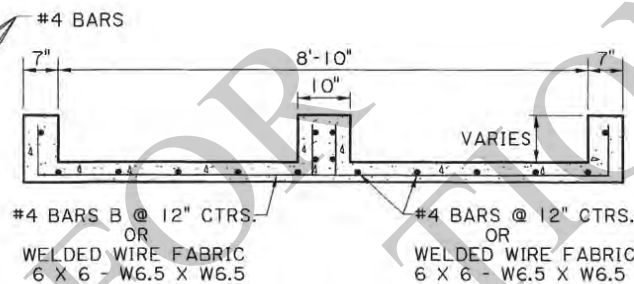


PARTIAL VIEW SHOWING PAVED GUTTER DRAIN WITHOUT DROP INLET



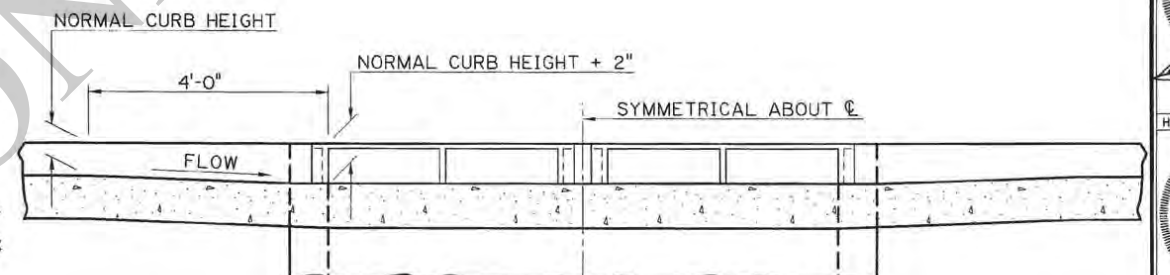
PLAN

FOR GRATE AND FRAME DETAILS, SEE
APPROPRIATE CATCH BASIN STANDARD
PLAN OR SPECIAL DETAIL AND STANDARD
PLAN MC-01.

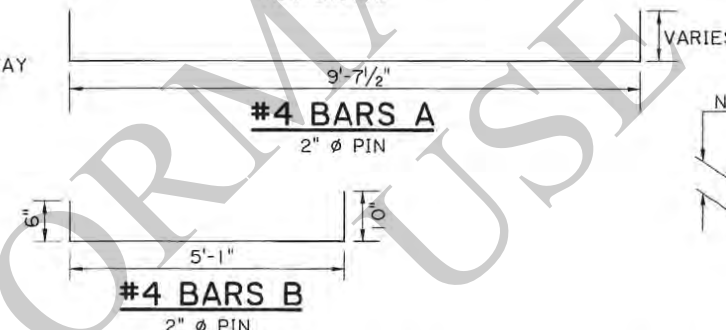


SECTION C-C

(CAST IRON COVER
NOT SHOWN)

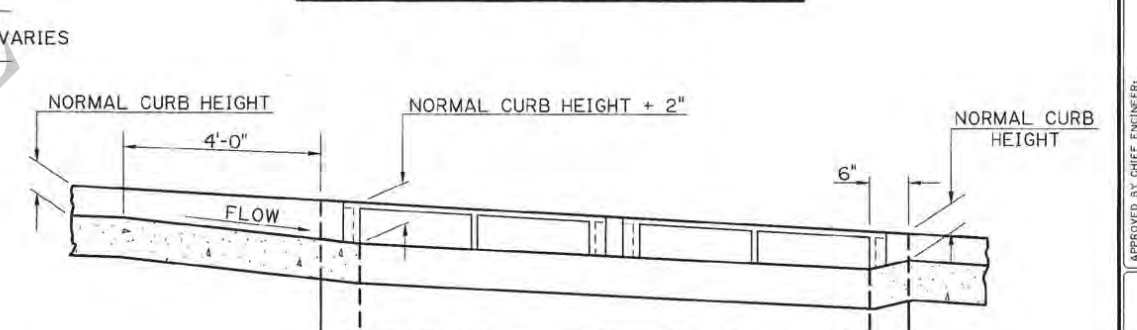


TRANSITION IN CURB HEIGHT GUTTER DRAIN AT LOW POINT

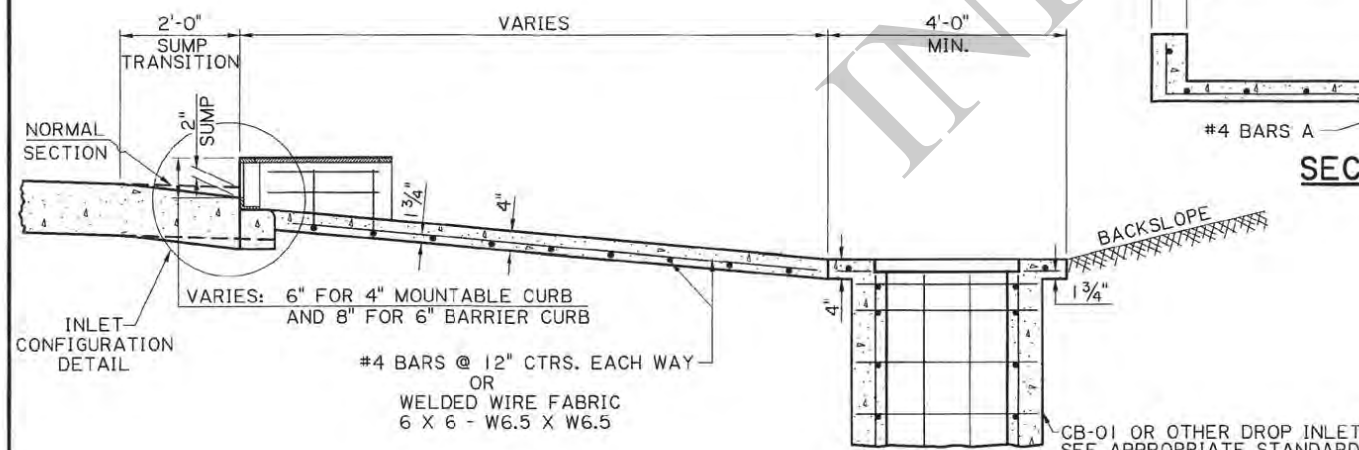


SECTION B-B

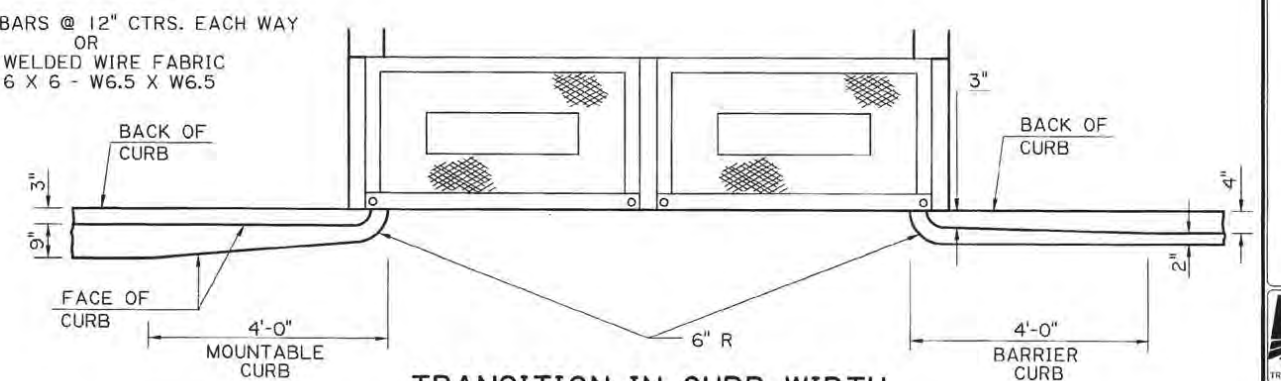
(CAST IRON COVER NOT SHOWN)



TRANSITION IN CURB HEIGHT GUTTER DRAIN ON A GRADE



SECTION A-A



TRANSITION IN CURB WIDTH (TYPICAL)

SHEET NUMBER		PARISH		CONTROL SECTION		STATE PROJECT	
DESIGN	CHECK	DETAIL	CHECK	REVIEW	SERIES		

STATE OF LOUISIANA

MITRA HASHEMIEH
REG. NO. 28546
REGISTERED PROFESSIONAL ENGINEER
IN CIVIL ENGINEERING
9/11/2020

HYDRAULICS

STATE OF LOUISIANA

ADAM LANCASTER
REG. NO. 35573
REGISTERED PROFESSIONAL ENGINEER
IN CIVIL ENGINEERING
9/10/20

STRUCTURAL

APPROVED BY CHIEF ENGINEER: *Christy P. Hardy* DATE: 9/22/2020

STATE OF LOUISIANA

DOUBLE PAVED GUTTER DRAIN

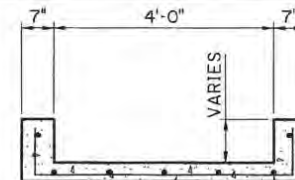
STANDARD PLAN PG-DRAIN (DOUBLE)

DOTD
LOUISIANA DEPARTMENT OF
TRANSPORTATION & DEVELOPMENT

HYDRAULICS
SECTION

GENERAL NOTES:

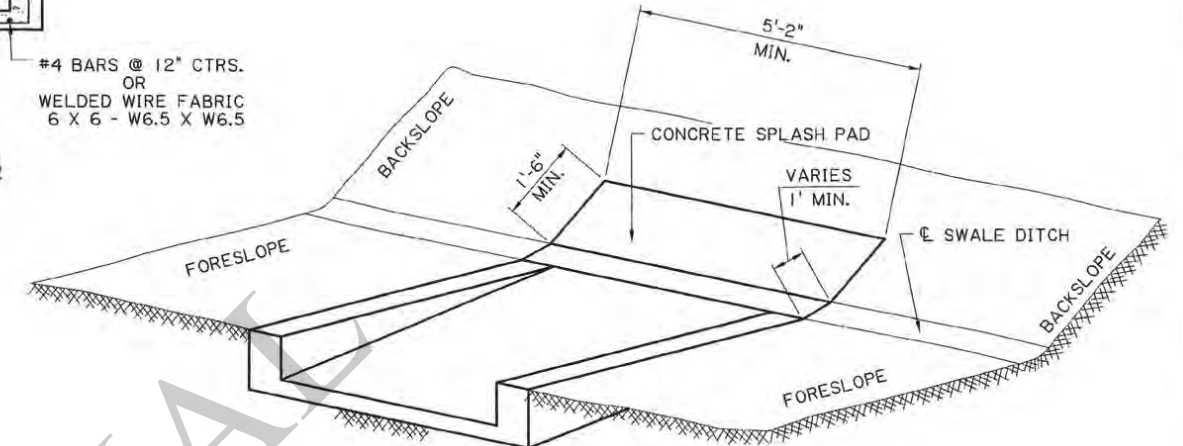
1. THIS STRUCTURE MEETS ALL DOTD HYDRAULIC PERFORMANCE CRITERIA WHEN USED IN ACCORDANCE WITH THE DOTD HYDRAULICS MANUAL AND ALL DOTD HYDRAULIC DESIGN POLICIES.
2. CONSTRUCTION SPECIFICATIONS: LATEST APPROVED LA DOTD STANDARD SPECIFICATIONS.
3. ALL EXPOSED CORNERS TO HAVE $\frac{3}{4}$ " CHAMFER UNLESS OTHERWISE NOTED.
4. DIMENSIONS RELATING TO REINFORCING STEEL FABRICATION ARE OUT-TO-OUT OF BARS AND DIMENSIONS RELATING TO REINFORCING STEEL SPACING ARE CENTER-TO-CENTER OF BARS.
5. REINFORCING STEEL SHALL HAVE 2" COVER UNLESS OTHERWISE SPECIFIED.
6. IF PRECAST CATCH BASIN IS USED, PLEASE REFER TO STANDARD PLAN PC-01 FOR DETAILS AND SPECIFICATIONS.



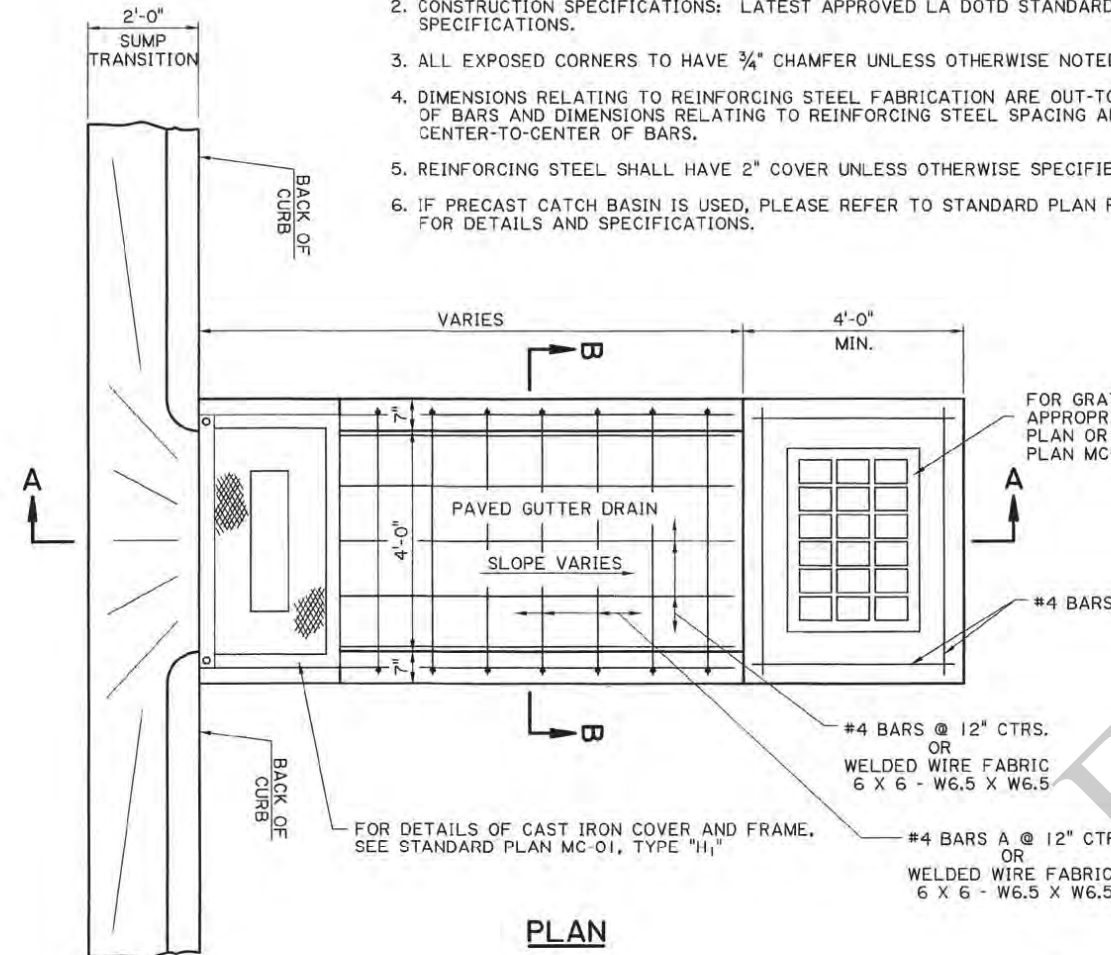
#4 BARS @ 12" CTRS.
OR
WELDED WIRE FABRIC
6 X 6 - W6.5 X W6.5

#4 BARS @ 12" CTRS.
OR
WELDED WIRE FABRIC
6 X 6 - W6.5 X W6.5

SECTION B-B



PARTIAL VIEW SHOWING
PAVED GUTTER DRAIN WITHOUT DROP INLET



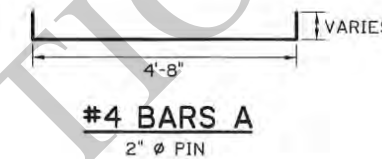
PLAN

FOR GRATE AND FRAME DETAILS, SEE
APPROPRIATE CATCH BASIN STANDARD
PLAN OR SPECIAL DETAIL AND STANDARD
PLAN MC-01.

FOR DETAILS OF CAST IRON COVER AND FRAME,
SEE STANDARD PLAN MC-01, TYPE "H1"

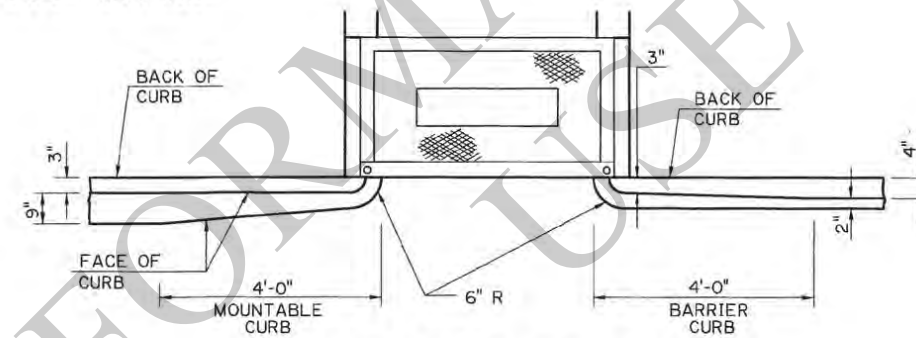
#4 BARS @ 12" CTRS.
OR
WELDED WIRE FABRIC
6 X 6 - W6.5 X W6.5

#4 BARS @ 12" CTRS.
OR
WELDED WIRE FABRIC
6 X 6 - W6.5 X W6.5

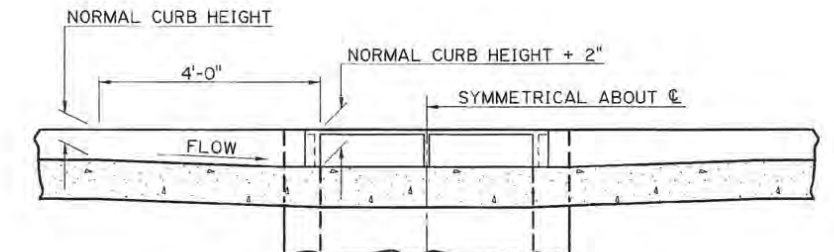


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OR
WELDED WIRE FABRIC
6 X 6 - W6.5 X W6.5

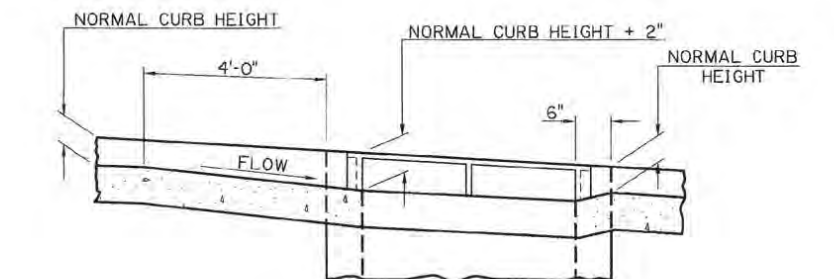
TRANSITION IN CURB WIDTH
(TYPICAL)



TRANSITION IN CURB HEIGHT
GUTTER DRAIN AT LOW POINT



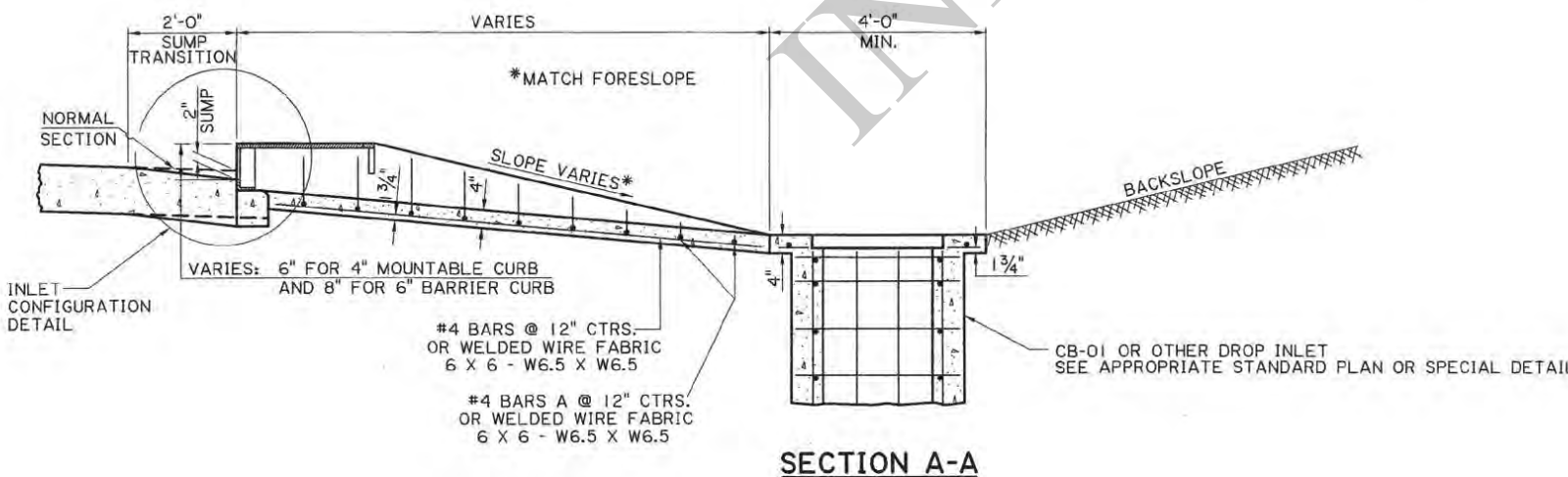
TRANSITION IN CURB HEIGHT
GUTTER DRAIN ON A GRADE



INLET CONFIGURATION

WHEN USED WITH
6" BARRIER CURB

WHEN USED WITH
4" MOUNTABLE CURB



SECTION A-A

#4 BARS @ 12" CTRS.
OR WELDED WIRE FABRIC
6 X 6 - W6.5 X W6.5

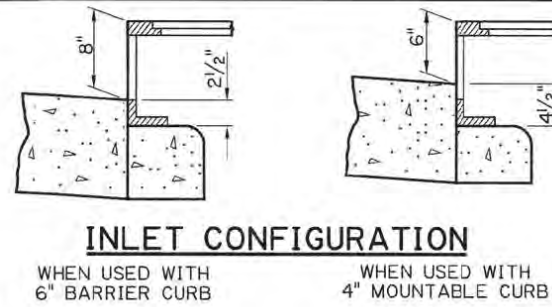
#4 BARS @ 12" CTRS.
OR WELDED WIRE FABRIC
6 X 6 - W6.5 X W6.5

CB-01 OR OTHER DROP INLET
SEE APPROPRIATE STANDARD PLAN OR SPECIAL DETAIL

SHEET NUMBER		PARISH		CONTROL SECTION		STATE PROJECT	
DESIGN	CHECK	DETAIL	CHECK	REVIEW	SERIES		
STATE OF LOUISIANA MITRA HASHEMIEH REG. No. 28546 REGISTERED PROFESSIONAL ENGINEER IN CIVIL ENGINEERING 9/11/2020 HYDRAULICS STATE OF LOUISIANA ADAM LANCASTER REG. No. 35573 REGISTERED PROFESSIONAL ENGINEER IN CIVIL ENGINEERING 9/10/20 STRUCTURAL APPROVED BY CHIEF ENGINEER: [Signature] DATE: 9/22/2020 STATE OF LOUISIANA REGISTERED PROFESSIONAL ENGINEER IN CIVIL ENGINEERING SINGLE PAVED GUTTER DRAIN STANDARD PLAN PG-DRAIN (SINGLE) DOTD LOUISIANA DEPARTMENT OF TRANSPORTATION & DEVELOPMENT HYDRAULICS SECTION							

GENERAL NOTES:

1. THIS STRUCTURE MEETS ALL DOTD HYDRAULIC PERFORMANCE CRITERIA WHEN USED IN ACCORDANCE WITH THE DOTD HYDRAULICS MANUAL AND ALL DOTD HYDRAULIC DESIGN POLICIES.
2. CONSTRUCTION SPECIFICATIONS: LATEST APPROVED LA DOTD STANDARD SPECIFICATIONS.
3. ALL EXPOSED CORNERS SHALL HAVE $\frac{3}{4}$ " CHAMFER UNLESS OTHERWISE NOTED.
4. DIMENSIONS RELATING TO REINFORCING STEEL FABRICATION ARE OUT-TO-OUT OF BARS AND DIMENSIONS RELATING TO REINFORCING STEEL SPACING ARE CENTER-TO-CENTER OF BARS.
5. REINFORCING STEEL SHALL HAVE 2" COVER UNLESS OTHERWISE SPECIFIED.
6. IF PRECAST CATCH BASIN IS USED, PLEASE REFER TO STANDARD PLAN PC-01 FOR DETAILS AND SPECIFICATIONS.
7. PAVED GUTTER DRAINS SHALL BE POURED MONOLITHICALLY.

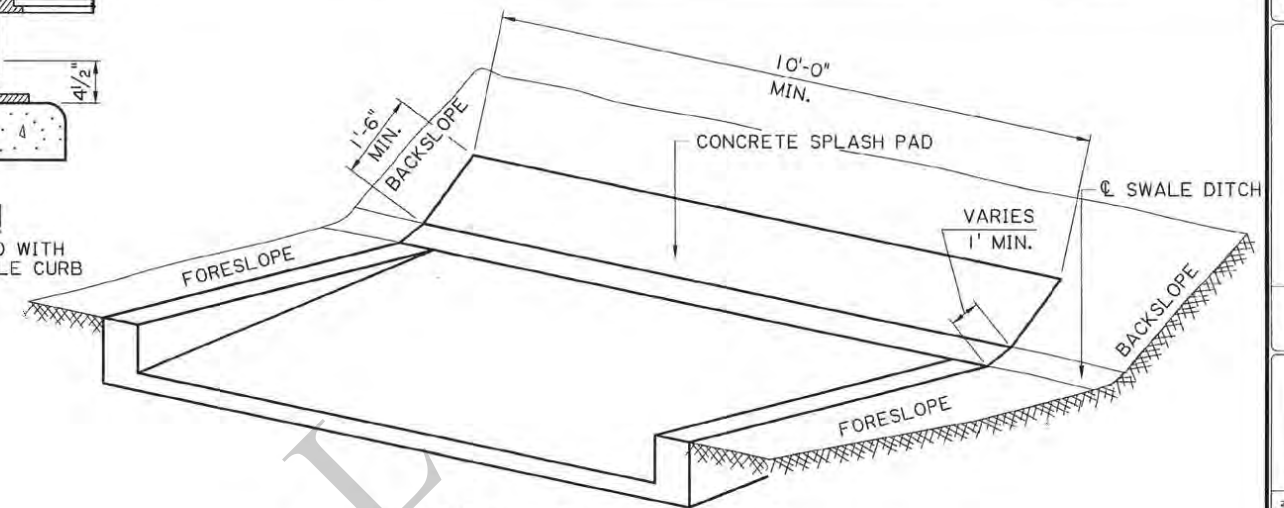


INLET CONFIGURATION

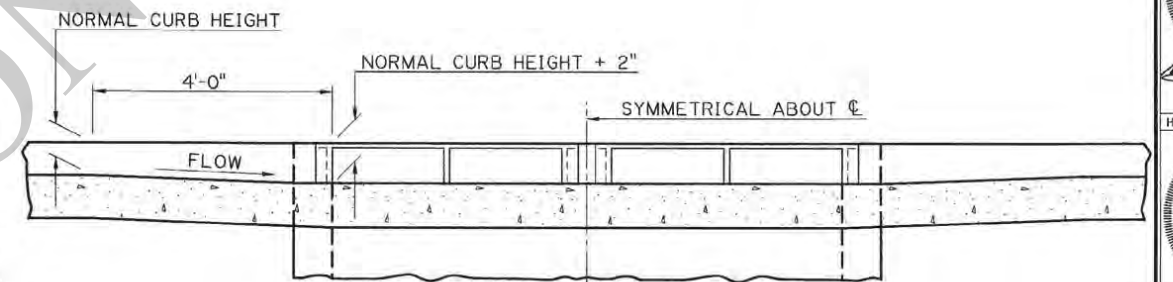
WHEN USED WITH
6" BARRIER CURB

WHEN USED WITH
4" MOUNTABLE CURB

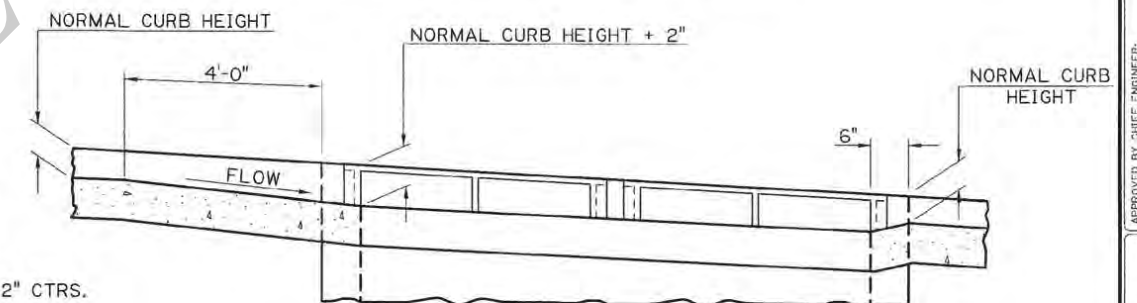
FOR GRATE AND FRAME DETAILS, SEE
APPROPRIATE CATCH BASIN STANDARD
PLAN OR SPECIAL DETAIL AND STANDARD
PLAN MC-01.



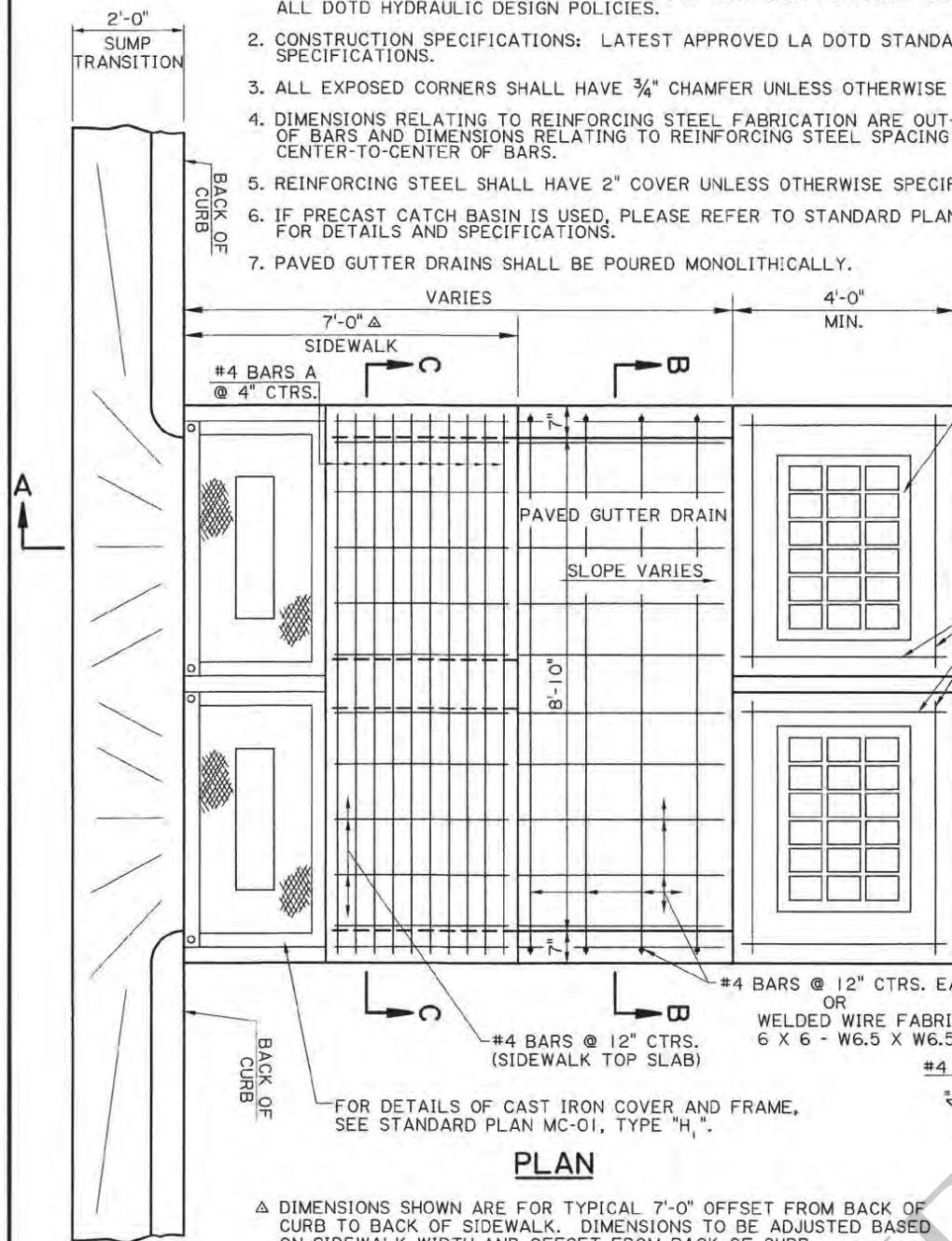
PARTIAL VIEW SHOWING PAVED GUTTER DRAIN WITHOUT DROP INLET



TRANSITION IN CURB HEIGHT GUTTER DRAIN AT LOW POINT

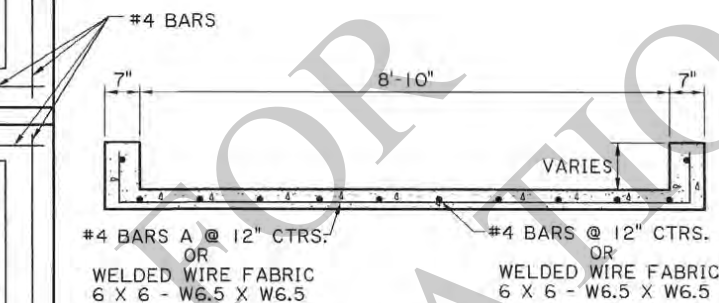


TRANSITION IN CURB HEIGHT GUTTER DRAIN ON A GRADE

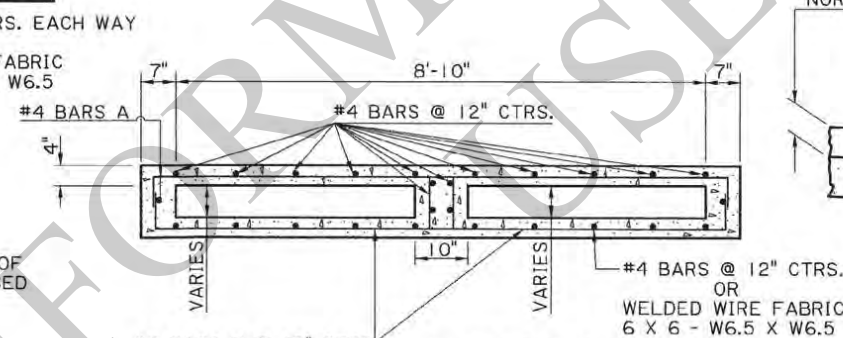


PLAN

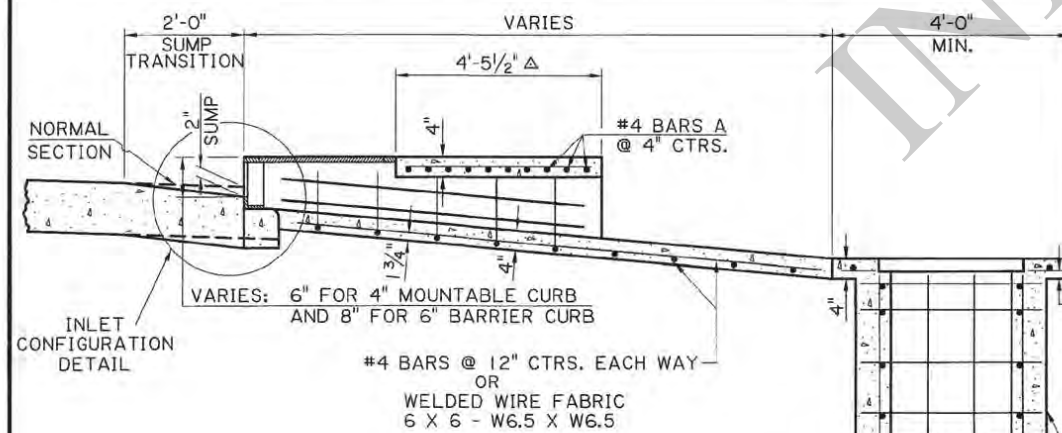
Δ DIMENSIONS SHOWN ARE FOR TYPICAL 7'-0" OFFSET FROM BACK OF CURB TO BACK OF SIDEWALK. DIMENSIONS TO BE ADJUSTED BASED ON SIDEWALK WIDTH AND OFFSET FROM BACK OF CURB.



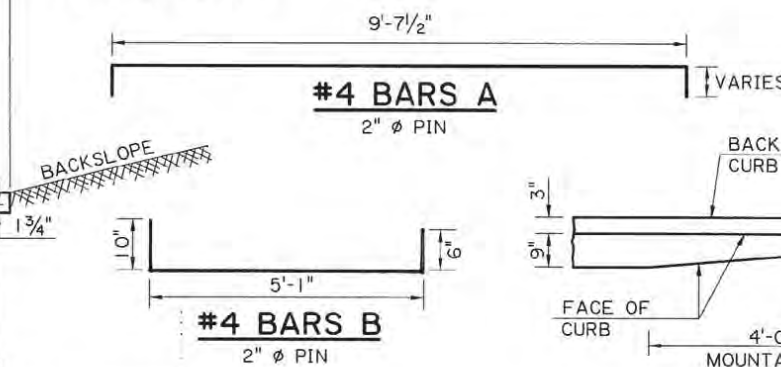
SECTION B-B



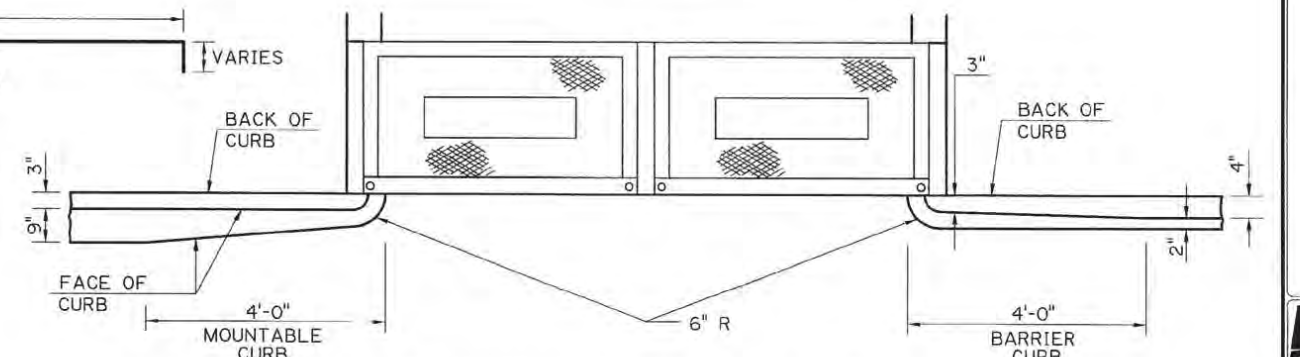
SECTION C-C



SECTION A-A



CB-01 OR OTHER DROP INLET
SEE APPROPRIATE STANDARD
PLAN OR SPECIAL DETAIL

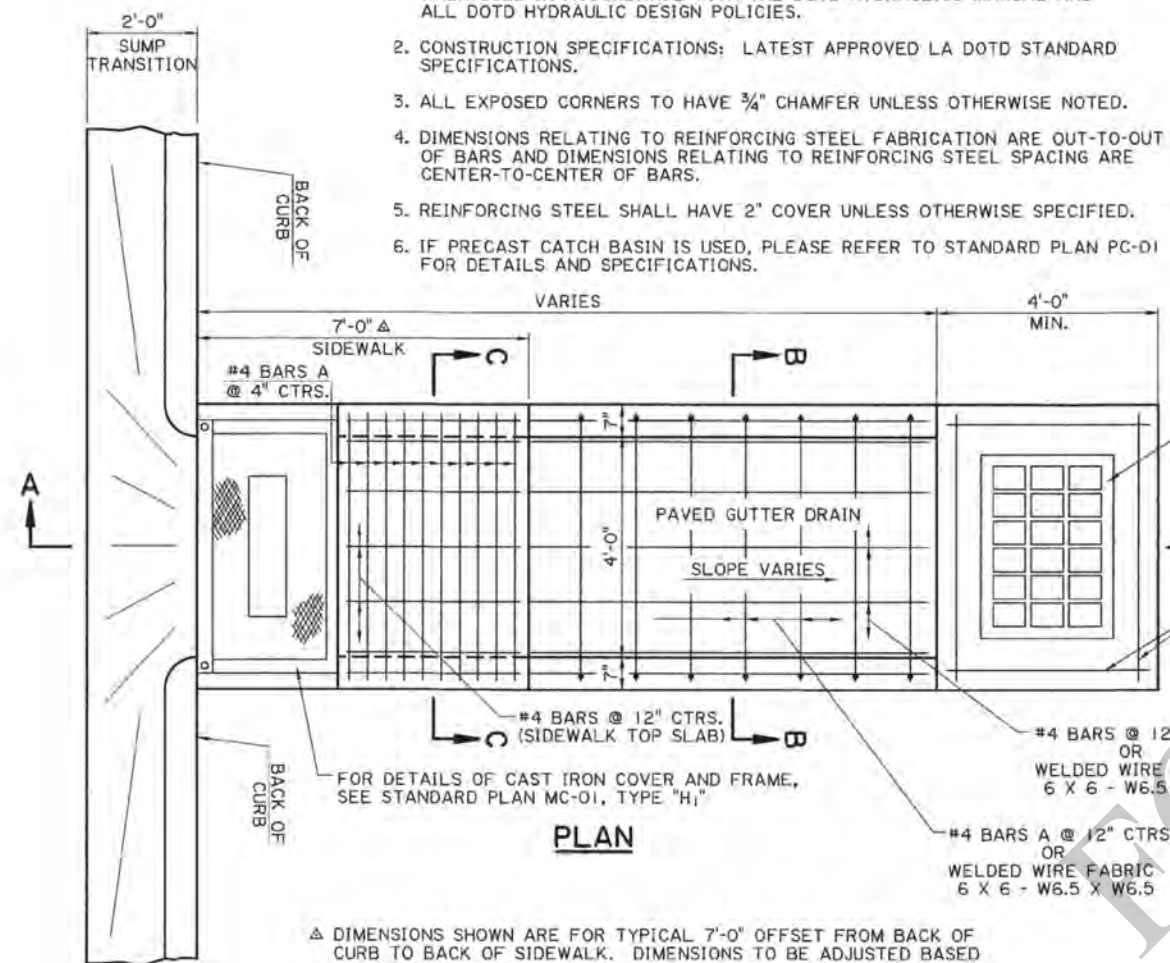


TRANSITION IN CURB WIDTH (TYPICAL)

SHEET NUMBER		DATE	
DESIGN	CHECK	DETAIL	CHECK
REVIEW	SERIES	PROJECT	STATE
STATE OF LOUISIANA REGISTERED PROFESSIONAL ENGINEER IN CIVIL ENGINEERING MITRA HASHEMIEH REG. NO. 28546 9/11/2020			
STATE OF LOUISIANA REGISTERED PROFESSIONAL ENGINEER IN CIVIL ENGINEERING ADAM LANCASTER REG. NO. 35573 9/10/20			
APPROVED BY CHIEF ENGINEER: [Signature] DATE: 9/22/2020			
DOUBLE PAVED GUTTER DRAIN WITH SIDEWALK			
PC-DRAIN WITH SIDEWALK (DOUBLE)			
DOTD LOUISIANA DEPARTMENT OF TRANSPORTATION & DEVELOPMENT			
HYDRAULICS SECTION			

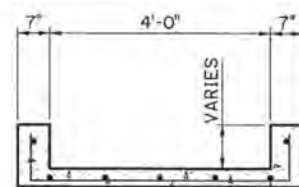
GENERAL NOTES:

1. THIS STRUCTURE MEETS ALL DOTD HYDRAULIC PERFORMANCE CRITERIA WHEN USED IN ACCORDANCE WITH THE DOTD HYDRAULICS MANUAL AND ALL DOTD HYDRAULIC DESIGN POLICIES.
2. CONSTRUCTION SPECIFICATIONS: LATEST APPROVED LA DOTD STANDARD SPECIFICATIONS.
3. ALL EXPOSED CORNERS TO HAVE $\frac{3}{4}$ " CHAMFER UNLESS OTHERWISE NOTED.
4. DIMENSIONS RELATING TO REINFORCING STEEL FABRICATION ARE OUT-TO-OUT OF BARS AND DIMENSIONS RELATING TO REINFORCING STEEL SPACING ARE CENTER-TO-CENTER OF BARS.
5. REINFORCING STEEL SHALL HAVE 2" COVER UNLESS OTHERWISE SPECIFIED.
6. IF PRECAST CATCH BASIN IS USED, PLEASE REFER TO STANDARD PLAN PC-D1 FOR DETAILS AND SPECIFICATIONS.



PLAN

△ DIMENSIONS SHOWN ARE FOR TYPICAL 7'-0" OFFSET FROM BACK OF CURB TO BACK OF SIDEWALK. DIMENSIONS TO BE ADJUSTED BASED ON SIDEWALK WIDTH AND OFFSET FROM BACK OF CURB.

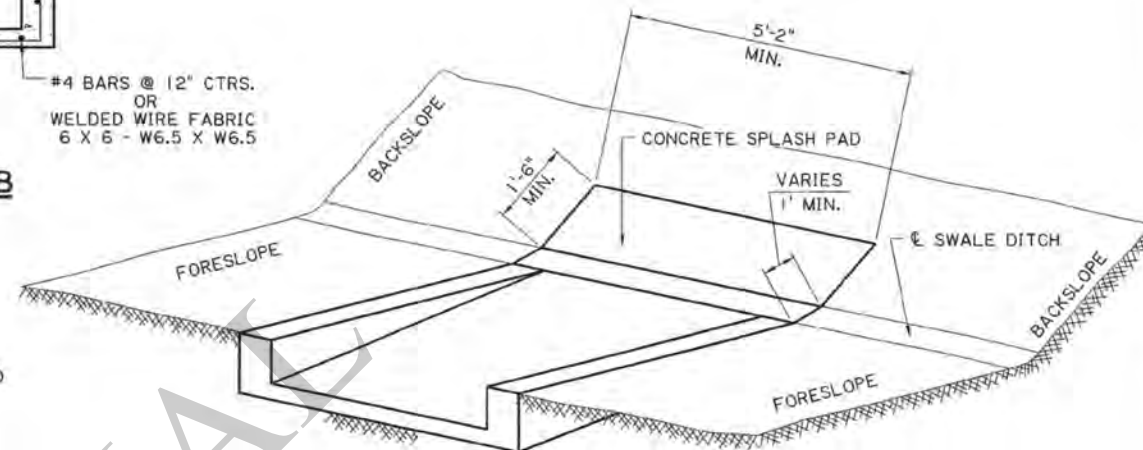


SECTION B-B

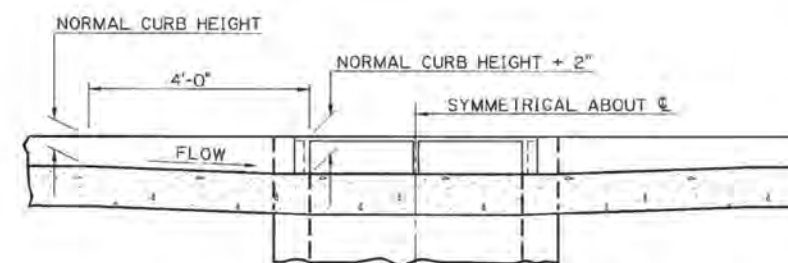
#4 BARS A @ 12" CTRS.
OR
WELDED WIRE FABRIC
6 X 6 - W6.5 X W6.5

#4 BARS @ 12" CTRS.
OR
WELDED WIRE FABRIC
6 X 6 - W6.5 X W6.5

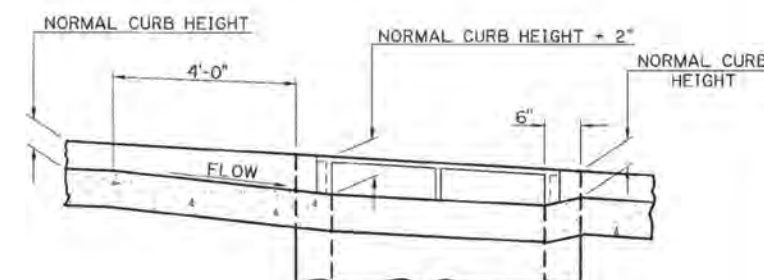
FOR GRATE AND FRAME DETAILS, SEE APPROPRIATE CATCH BASIN STANDARD PLAN OR SPECIAL DETAIL AND STANDARD PLAN MC-01.



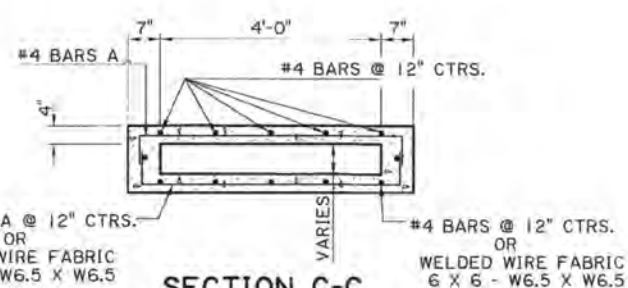
PARTIAL VIEW SHOWING PAVED GUTTER DRAIN WITHOUT DROP INLET



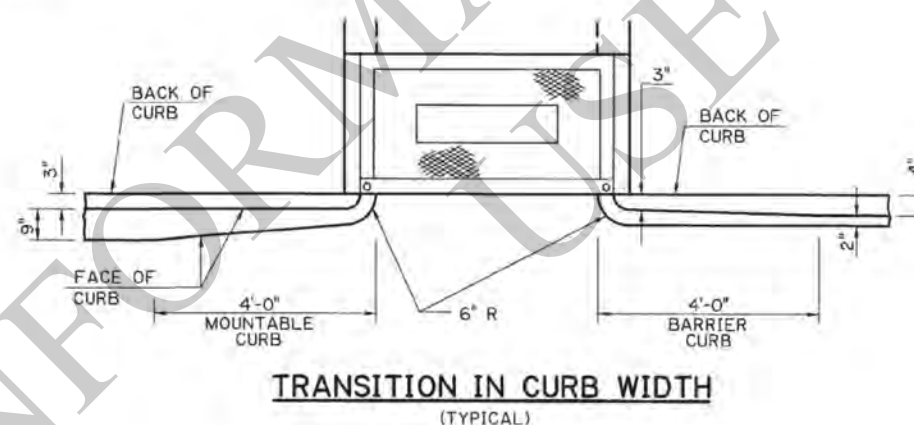
TRANSITION IN CURB HEIGHT GUTTER DRAIN AT LOW POINT



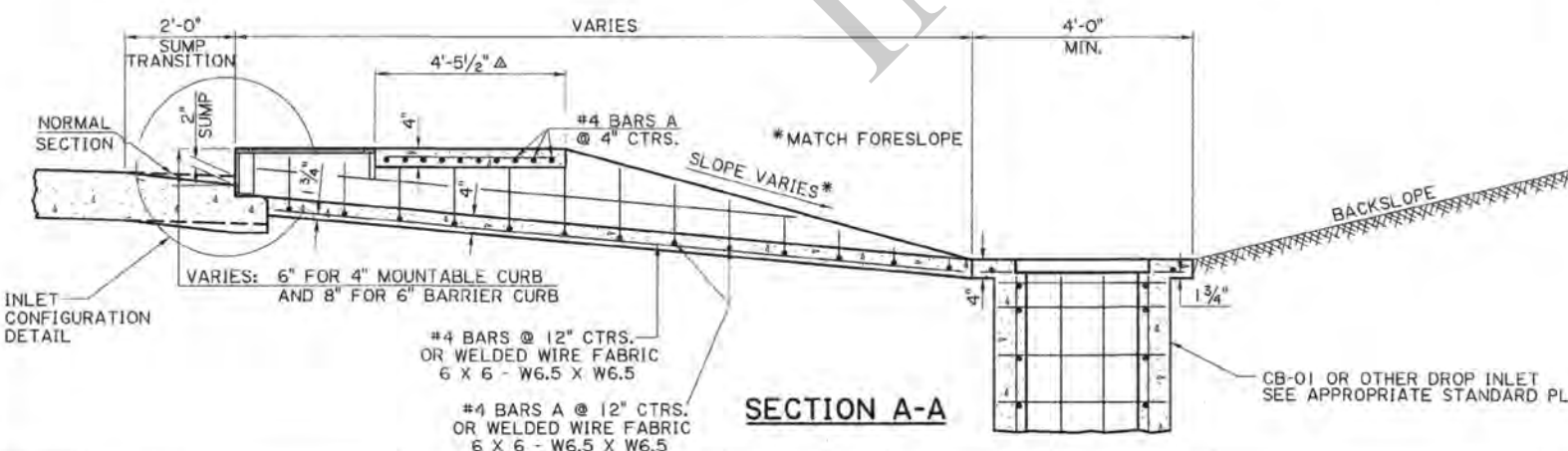
TRANSITION IN CURB HEIGHT GUTTER DRAIN ON A GRADE



SECTION C-C

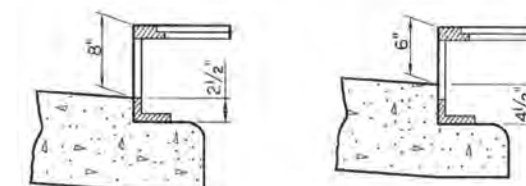


TRANSITION IN CURB WIDTH (TYPICAL)



SECTION A-A

CB-01 OR OTHER DROP INLET SEE APPROPRIATE STANDARD PLAN OR SPECIAL DETAIL

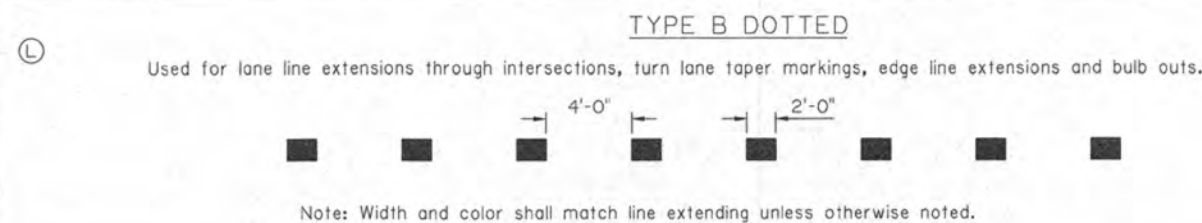
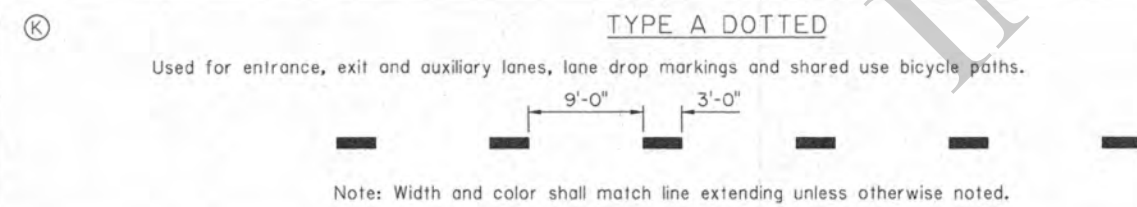
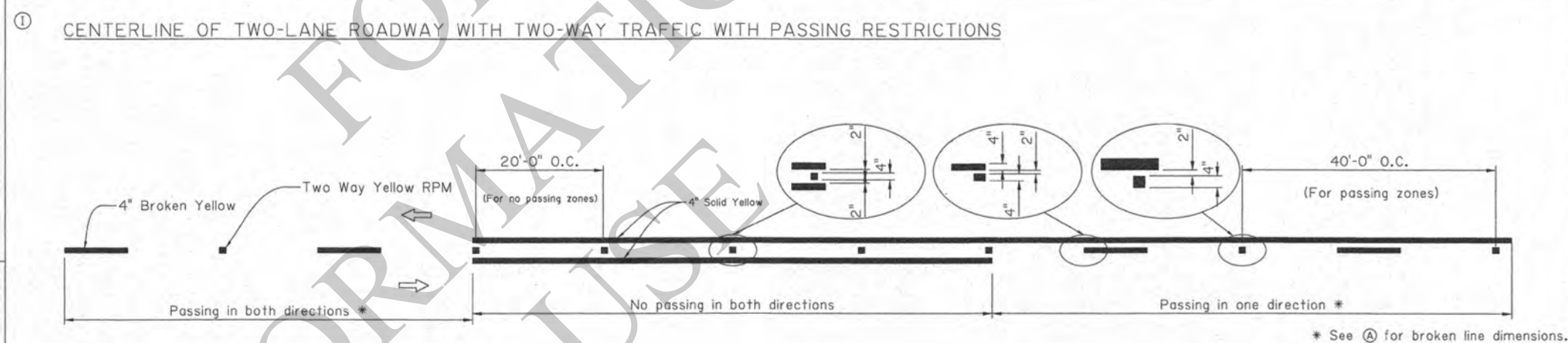
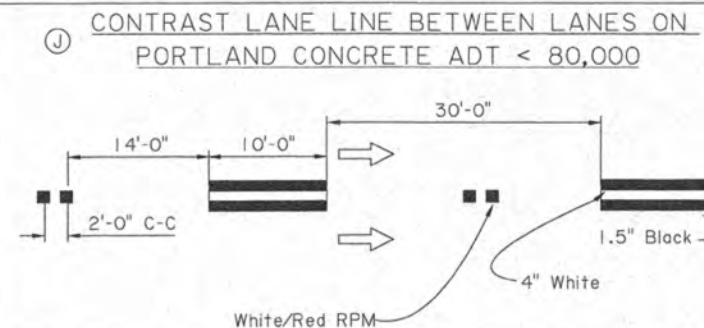
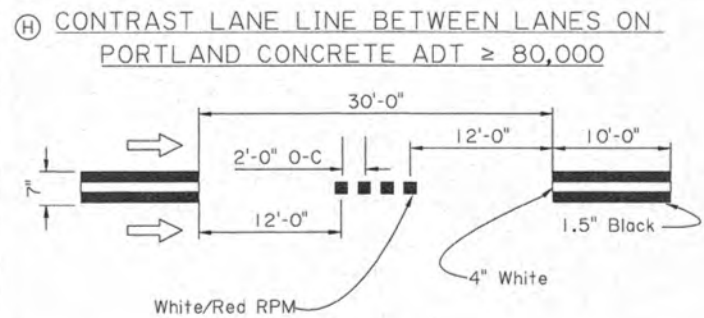
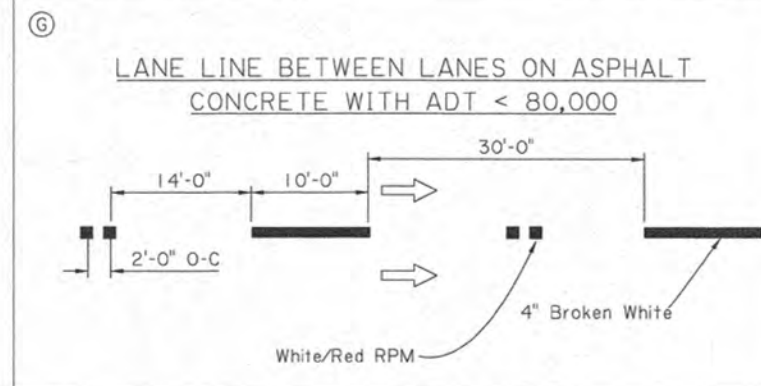
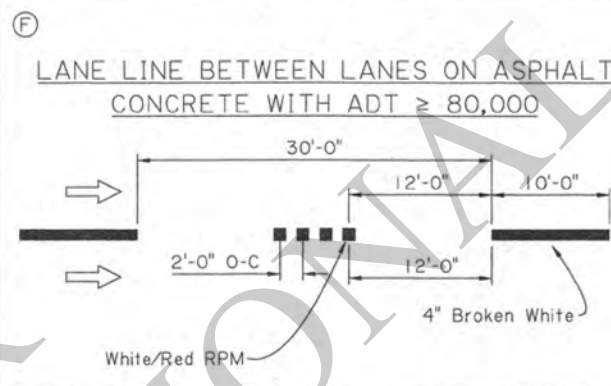
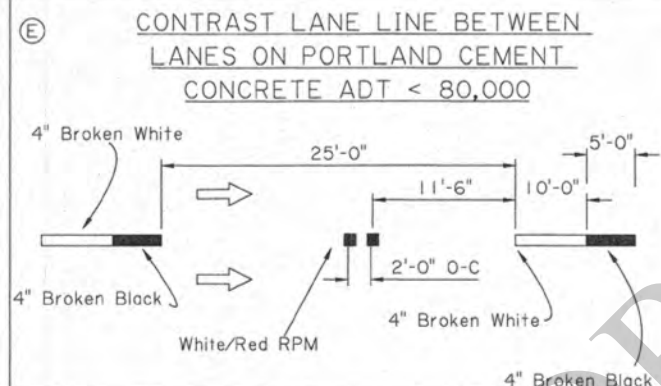
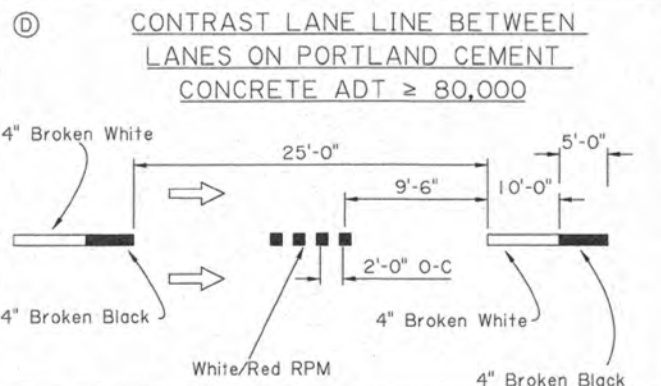
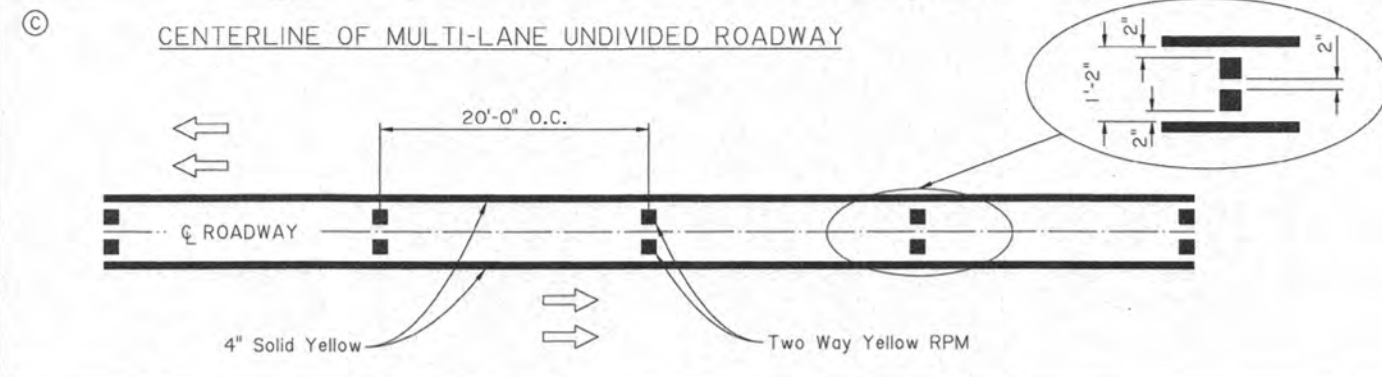
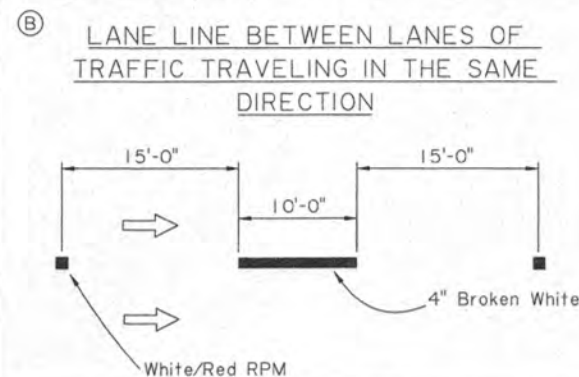
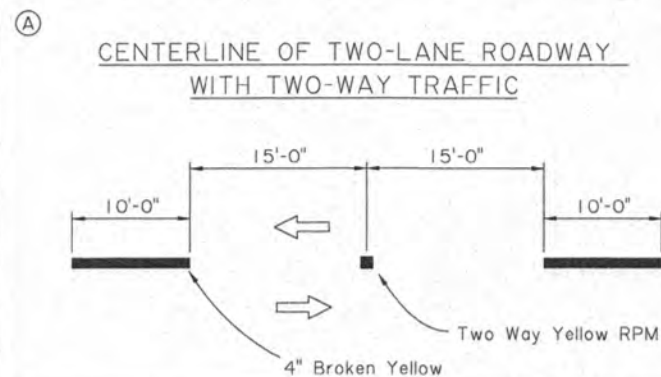


INLET CONFIGURATION

WHEN USED WITH 6" BARRIER CURB

WHEN USED WITH 4" MOUNTABLE CURB

SHEET NUMBER		DATE	
DESIGN	CHECK	DETAIL	CHECK
REVIEW	REVIEW	REVIEW	REVIEW
STATE OF LOUISIANA		STATE OF LOUISIANA	
MITRA HASHEMIEH REG. NO. 28546 REGISTERED PROFESSIONAL ENGINEER IN CIVIL ENGINEERING		ADAM LANCASTER REG. NO. 35573 REGISTERED PROFESSIONAL ENGINEER IN CIVIL ENGINEERING	
9/11/2020		9/10/2020	
HYDRAULICS		STRUCTURAL	
APPROVED BY UNCLT ENGINEER		APPROVED BY UNCLT ENGINEER	
SINGLE PAVED GUTTER DRAIN WITH SIDEWALK		PC-DRAIN WITH SIDEWALK (SINGLE)	
DOTD		DOTD	
LOUISIANA DEPARTMENT OF TRANSPORTATION & DEVELOPMENT		LOUISIANA DEPARTMENT OF TRANSPORTATION & DEVELOPMENT	
HYDRAULICS SECTION		HYDRAULICS SECTION	

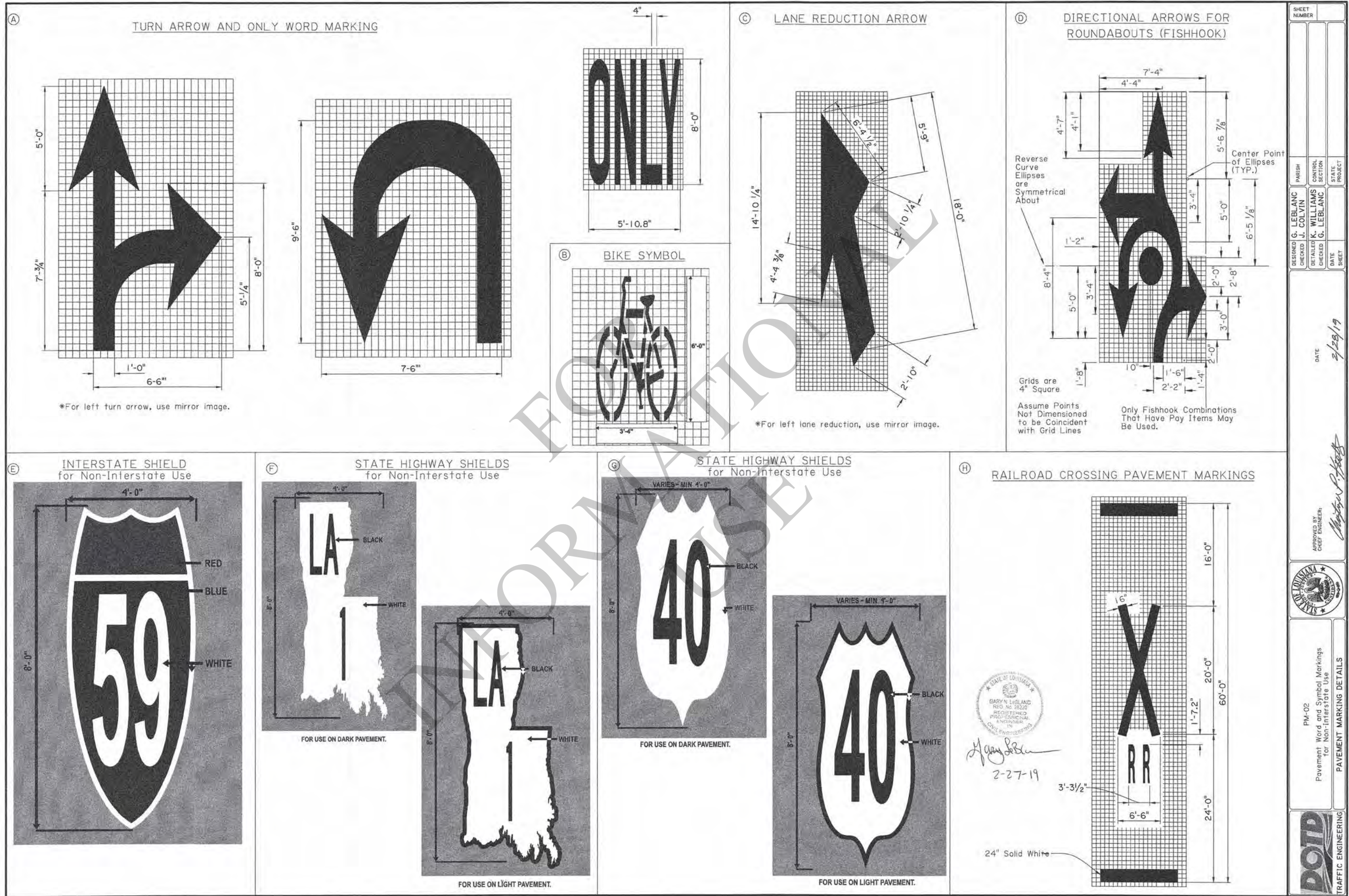


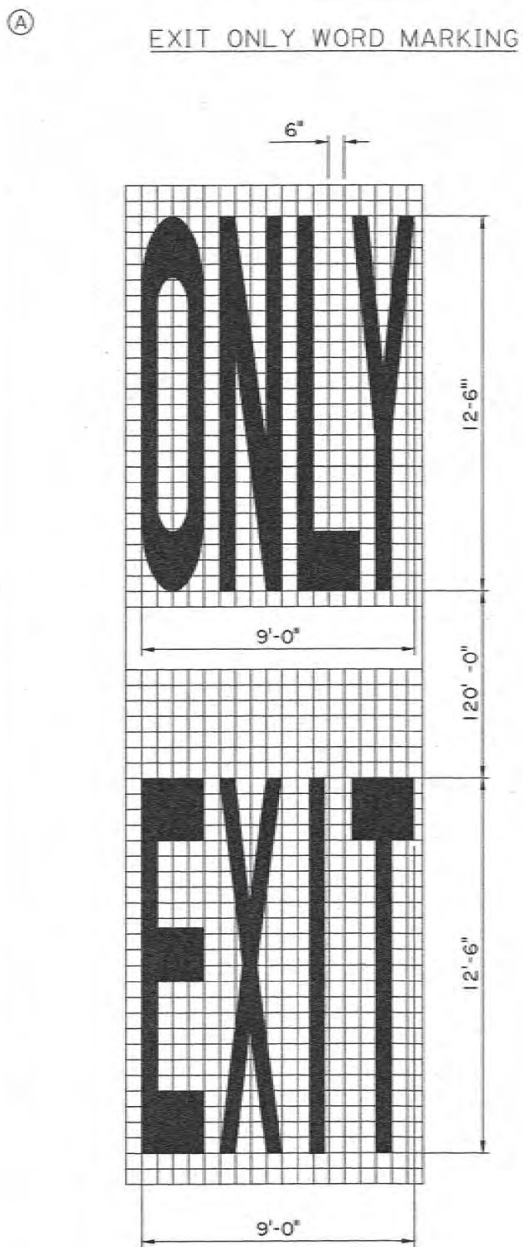
- GENERAL NOTES:**
- 4" Edge lines shall be placed on all roadways.
 - Place edge lines, centerlines and lane lines to avoid longitudinal joints as directed by the project engineer.
 - Edge lines in a curb and gutter section should be kept out of the gutter and clear from debris.
 - If rumble strips are used, striping details remain unchanged.
 - Centerlines shall be placed on roadways with a traveled way width of 16 feet or greater.
 - Where the clear width of a bridge is less than the clear width of the roadway, reflectorized pavement markers shall be placed adjacent to the edge line at 20' centers.
 - ⇒ indicates the direction of travel (not a pavement marker).
 - For non-interstate striping, use one Raised Reflectorized Pavement Marker.
 - White Reflectorized Pavement Marker faces same direction traffic and red faces opposing traffic.



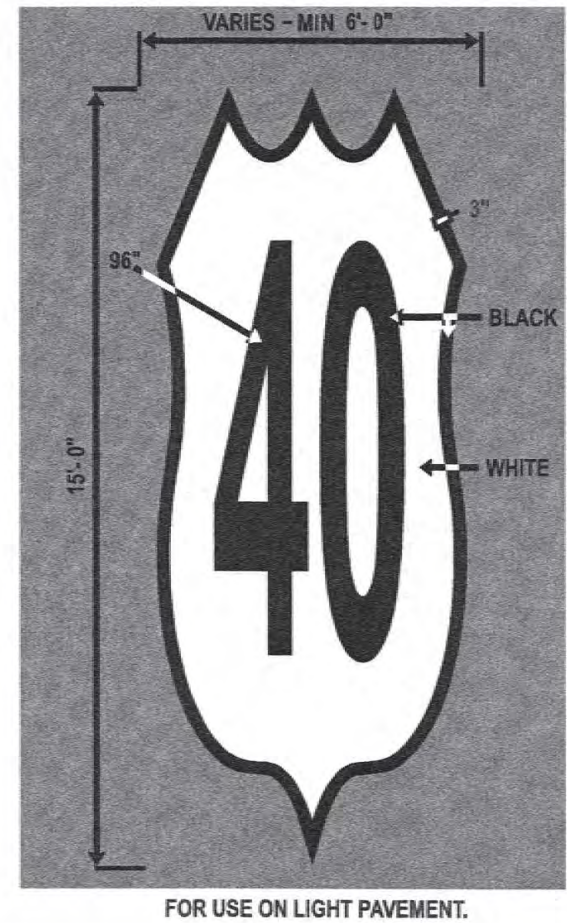
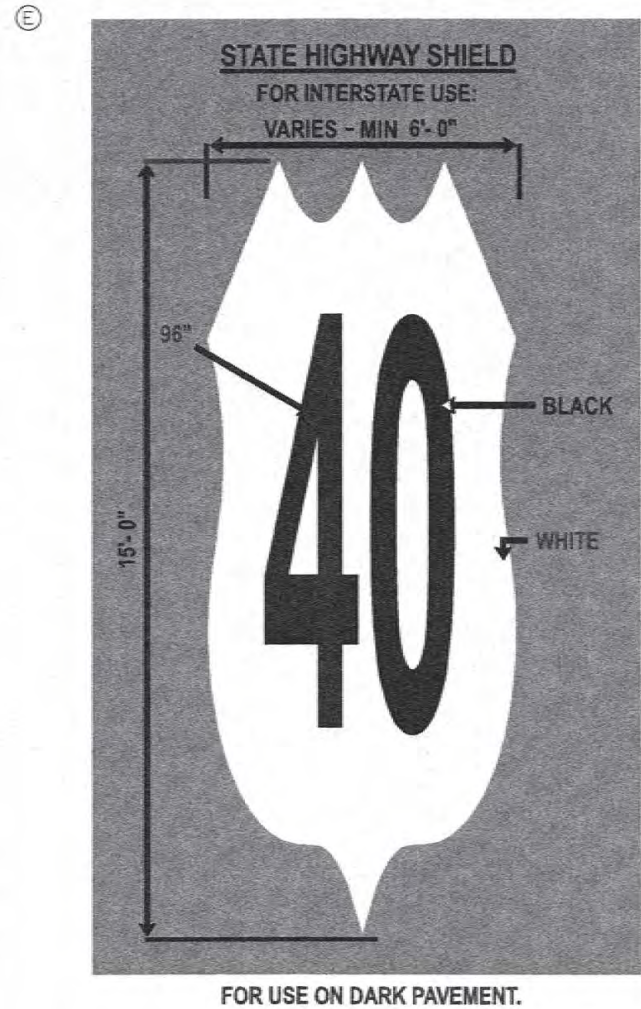
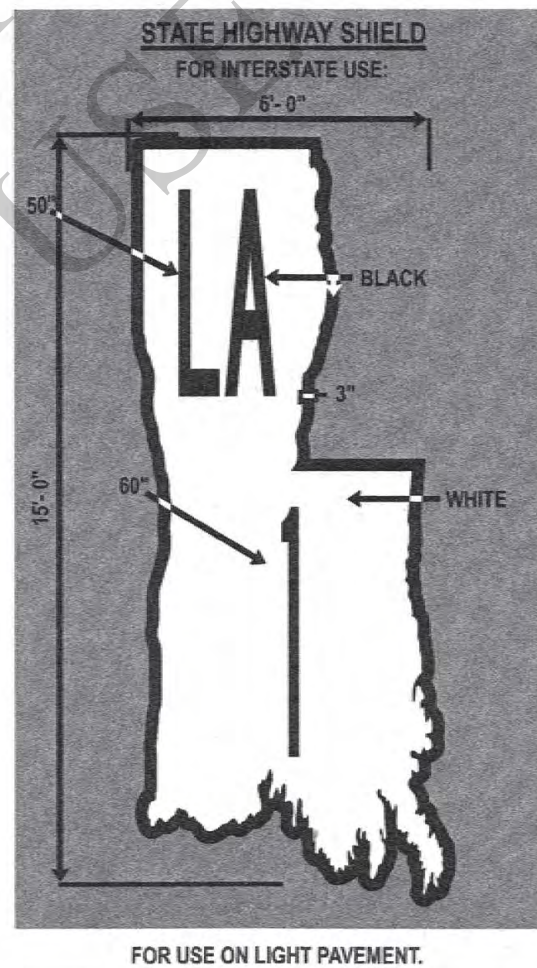
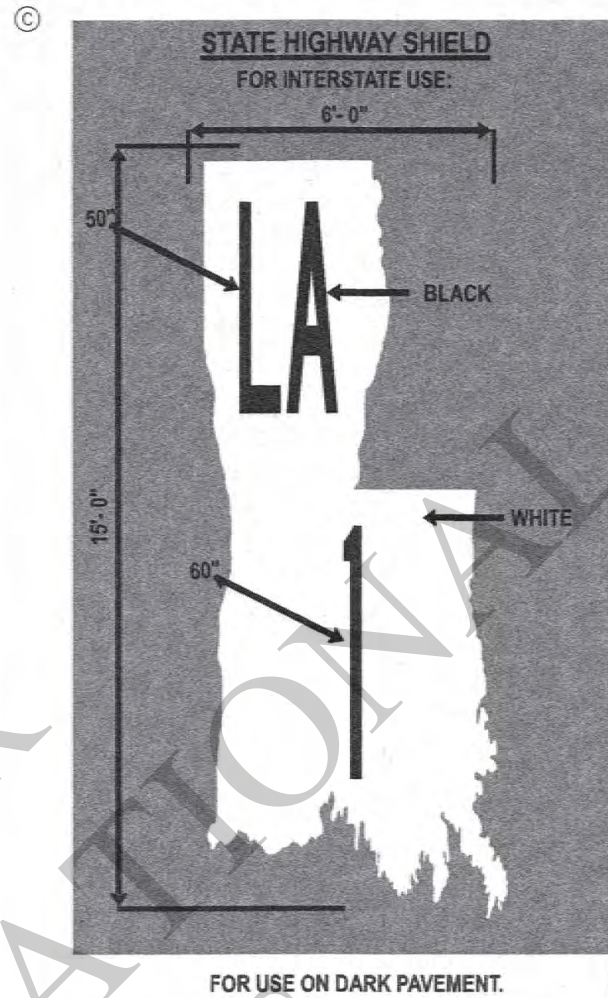
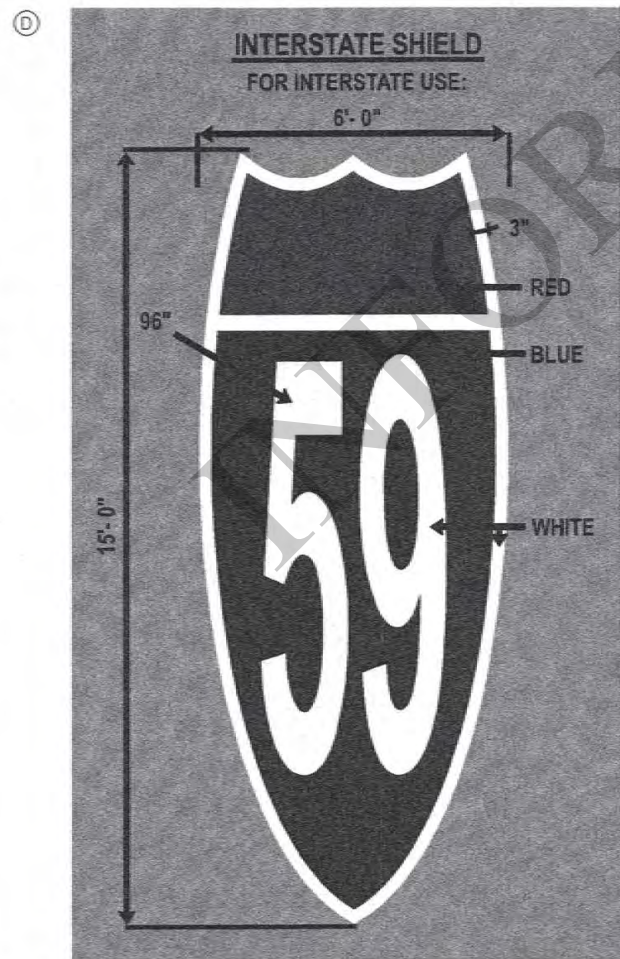
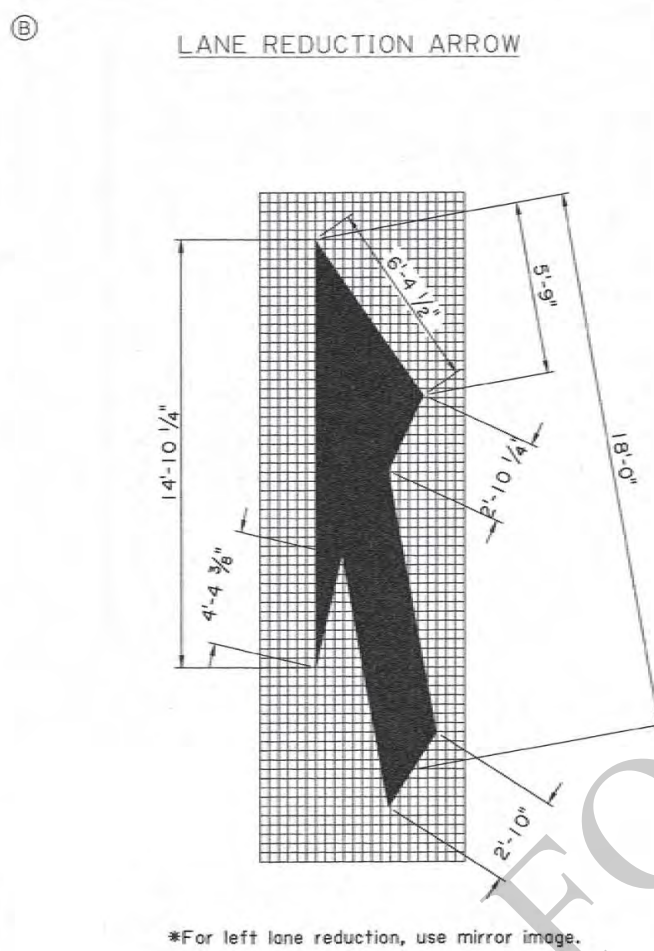
2-27-19

SHEET NUMBER	PARISH	CONTROL SECTION	STATE PROJECT
DESIGNED BY G. LEBLANC	CHECKED BY J. COLVIN	DATE	SHEET
DATE	2/28/19	APPROVED BY CHIEF ENGINEER	Christopher P. Hays
PAVEMENT MARKING DETAILS	PM-01	Centerline and Edgeline Markings	PAVEMENT MARKING DETAILS
TRAFFIC ENGINEERING	DOTD		

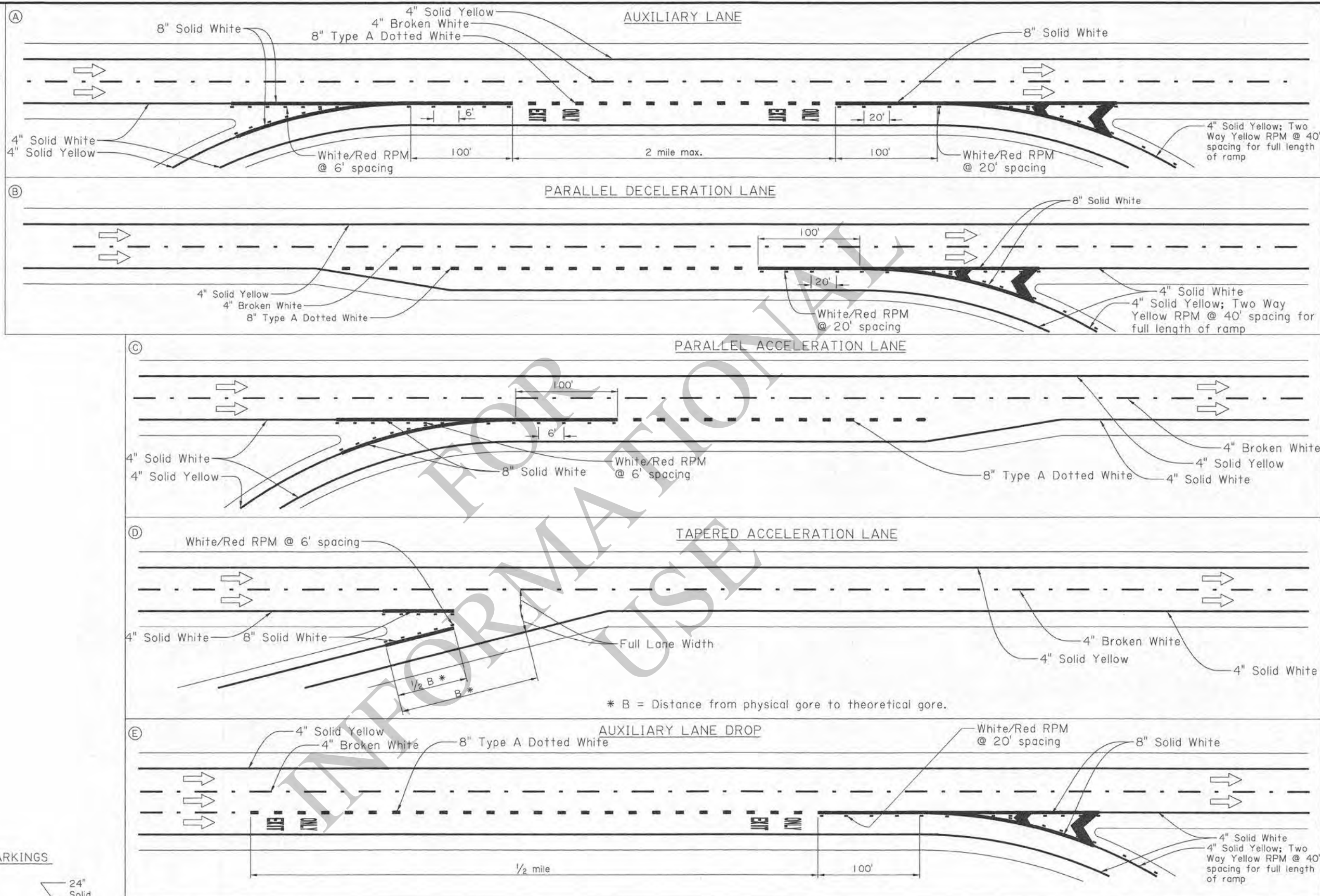




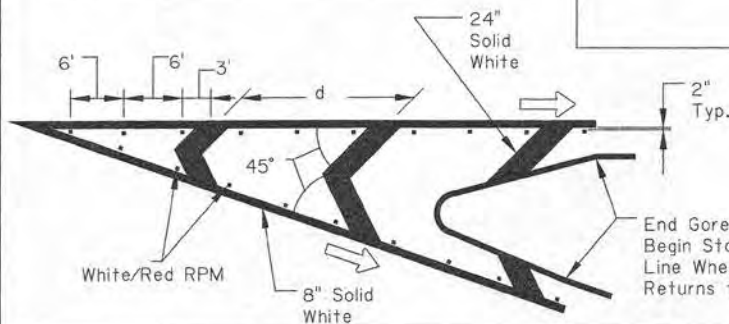
2-27-19



Note:
→ indicates the direction of travel (not a pavement marker).



TYPICAL EXIT GORE MARKINGS

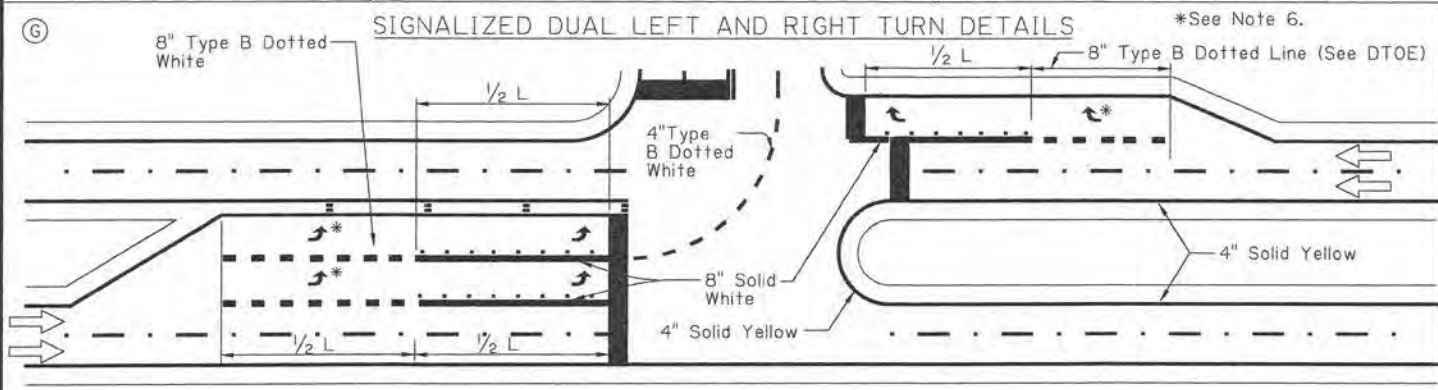
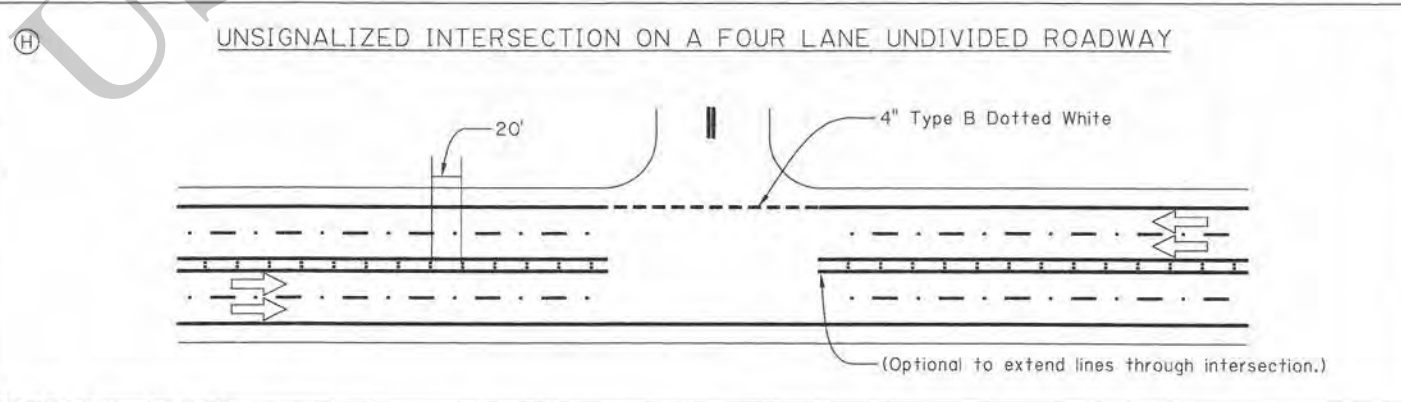
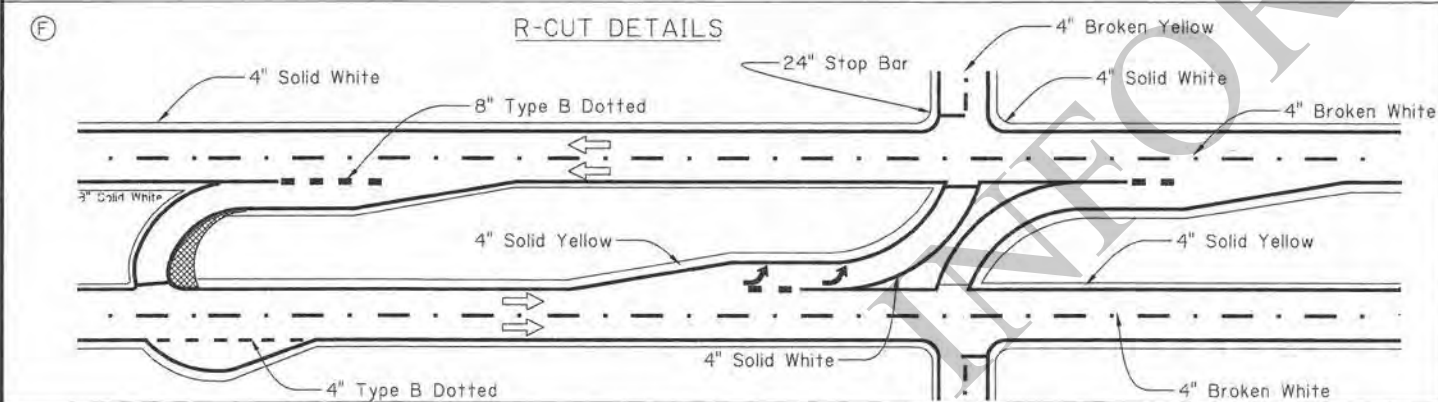
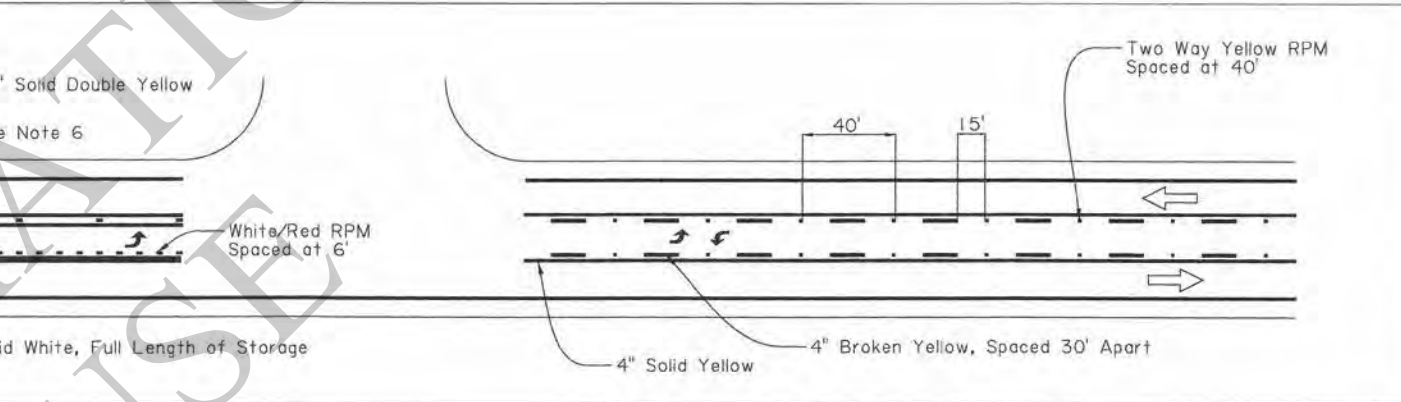
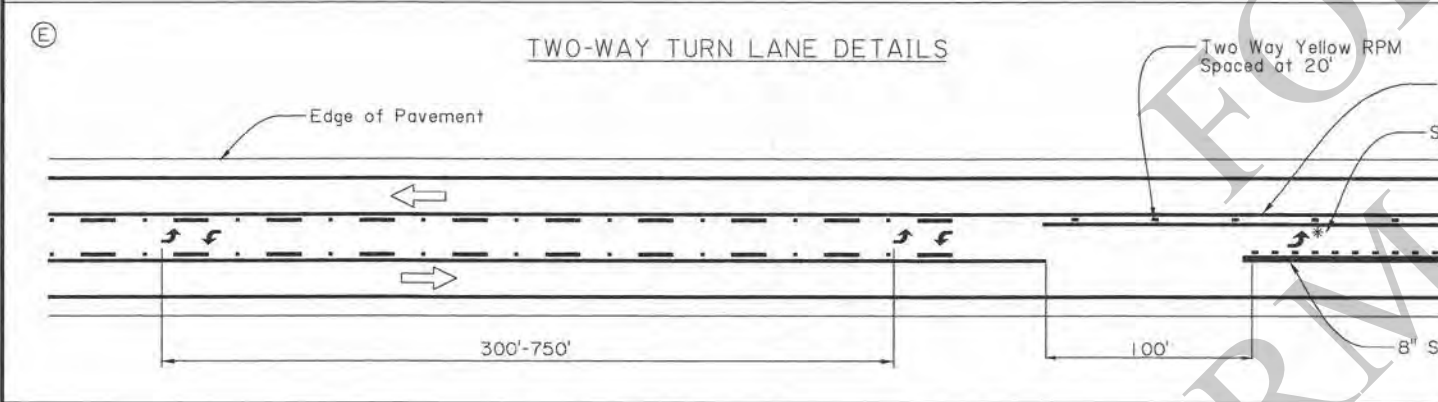
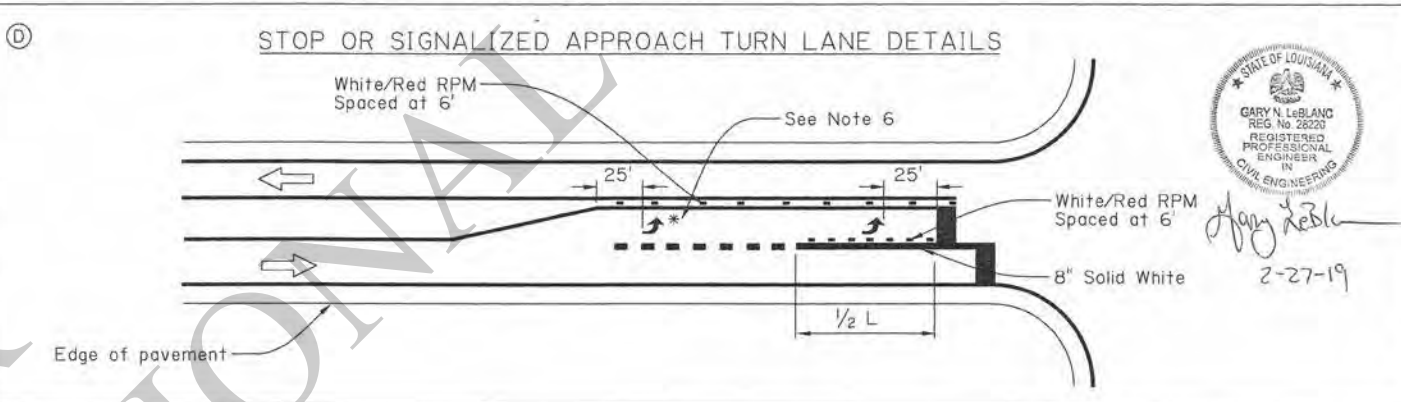
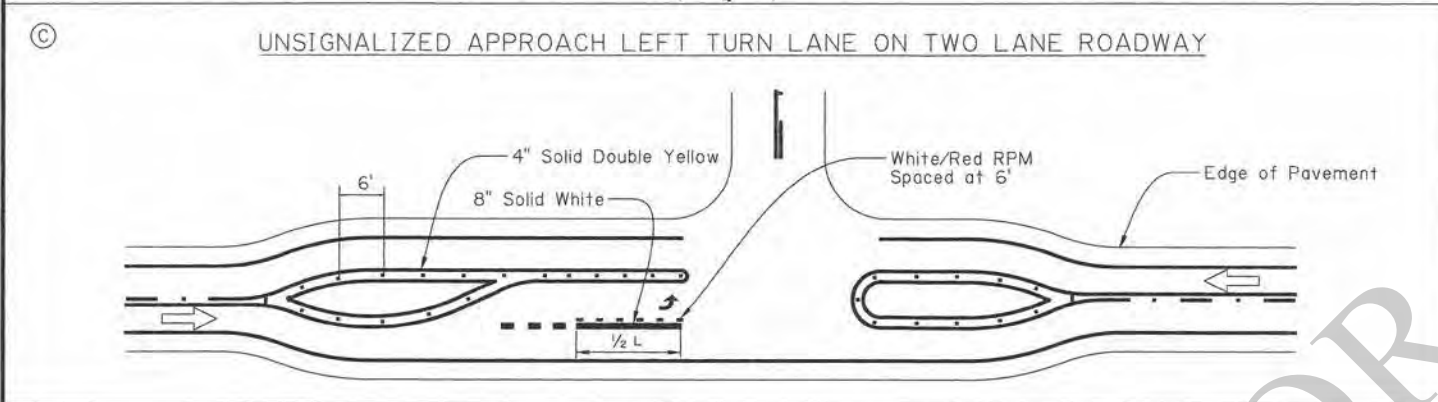
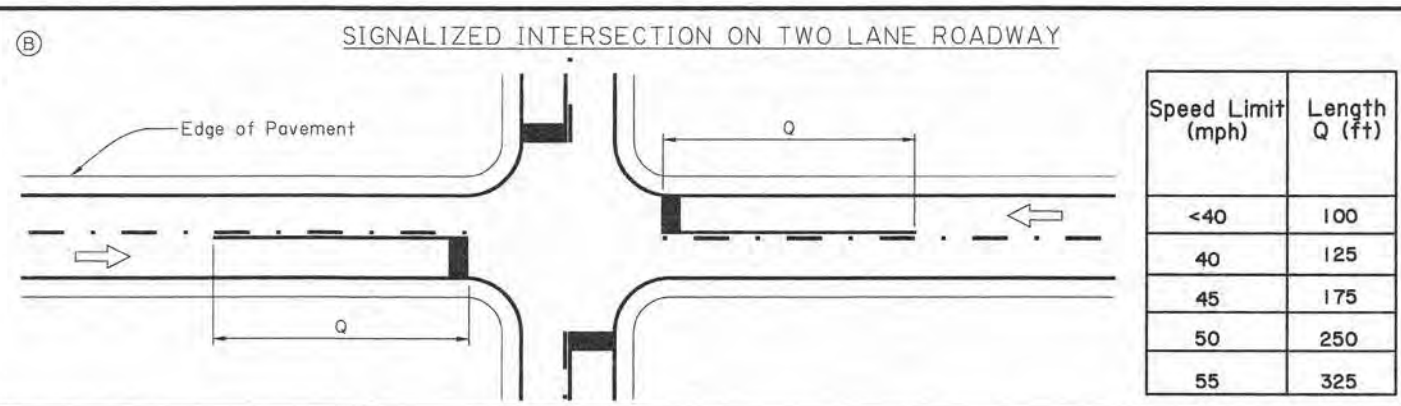
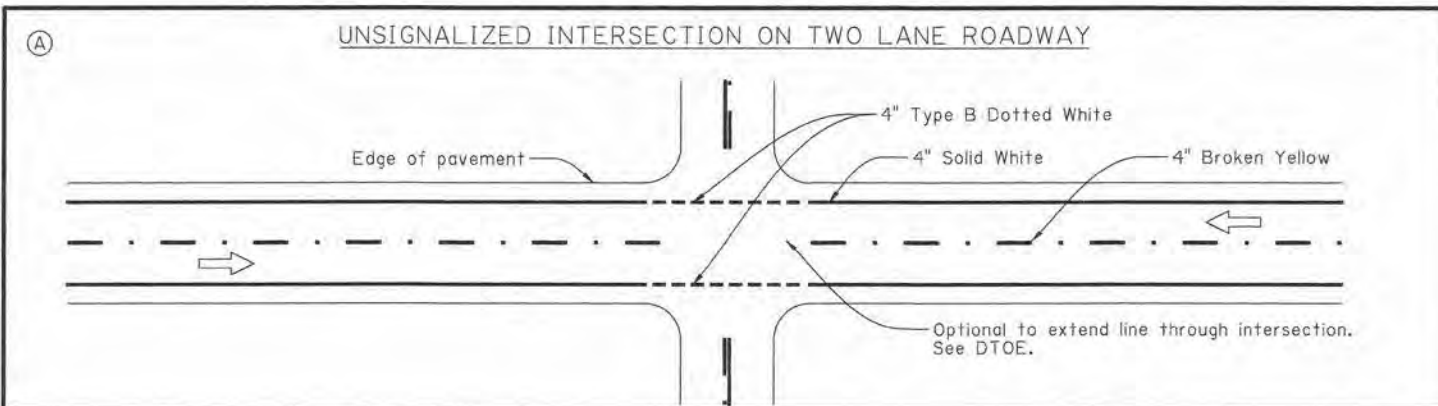


d	Mainline Speed
12'	45 MPH or Less
18'	50 or 55 MPH
24'	60 MPH or Above



Gary N. LeBlanc
2-27-19

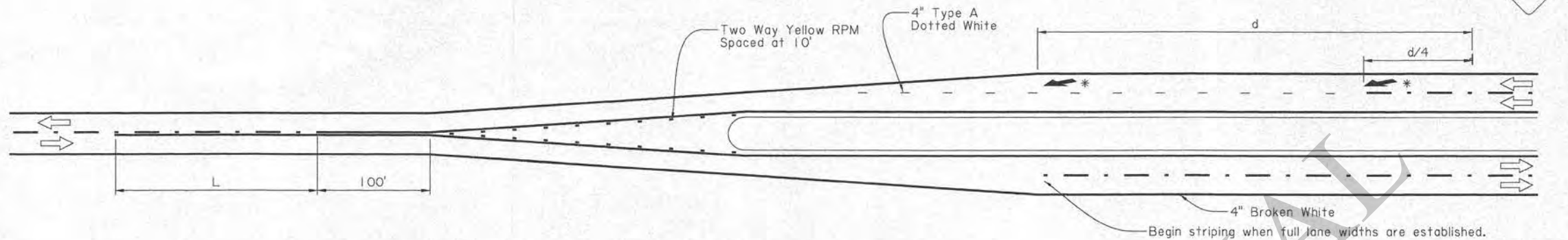
SHEET NUMBER	
DESIGNED BY G. LEBLANC	CONTROL SECTION J. COLVIN
CHECKED BY K. WILLIAMS	STATE PROJECT G. LEBLANC
DATE 2/28/19	SHEET
APPROVED BY CHIEF ENGINEER <i>Michael P. Kelly</i>	
PM-04 Auxiliary, Deceleration and Acceleration Lanes and Gore Stripping Layouts	
PAVEMENT MARKING DETAILS	
DOTD TRAFFIC ENGINEERING	



- GENERAL NOTES:**
1. If the minor street has edge lines, the edge lines on the major street shall wrap to meet the edge lines on the minor street.
 2. Stop bars shall be 24". Stop bars shall not be placed at a distance greater than 30 feet or less than 4 feet from the nearest edge line. Stop bars at right turn lanes should be placed to provide adequate sight distance for right turning traffic.
 3. The location of stop bars at left turn lanes should be determined by the turning radius needed by the side street vehicles.
 4. See PM-01 for centerline and lane line details.
 5. The ONLY word marking shall be used when a through lane terminates as a turn lane.
 6. The asterisk (*) indicates that 2nd arrow is optional. If more than two arrows are used, minimum spacing should be 150'.
 7. Edge lines should not be broken for driveways.
 8. → indicates the direction of travel (not a pavement marker).
 9. L equals the full length of turn lane.
 10. Use of dotted lines require DTOE approval.

(A)

TWO LANE TO FOUR LANE DIVIDED HIGHWAY

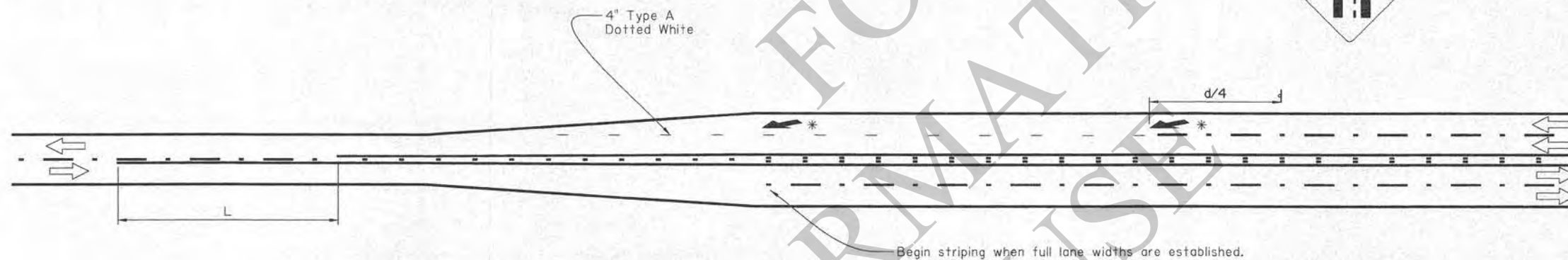


* No more than two reduction arrows shall be used per lane reduction.

85th Percentile or Speed Limit (mph)	Length of No Passing Minimum (L in feet)
25	100
30	100
35	100
40	125
45	175
50	250
55	325
60	400
65	475
70	550

(B)

TWO LANE TO FOUR LANE UNDIVIDED HIGHWAY

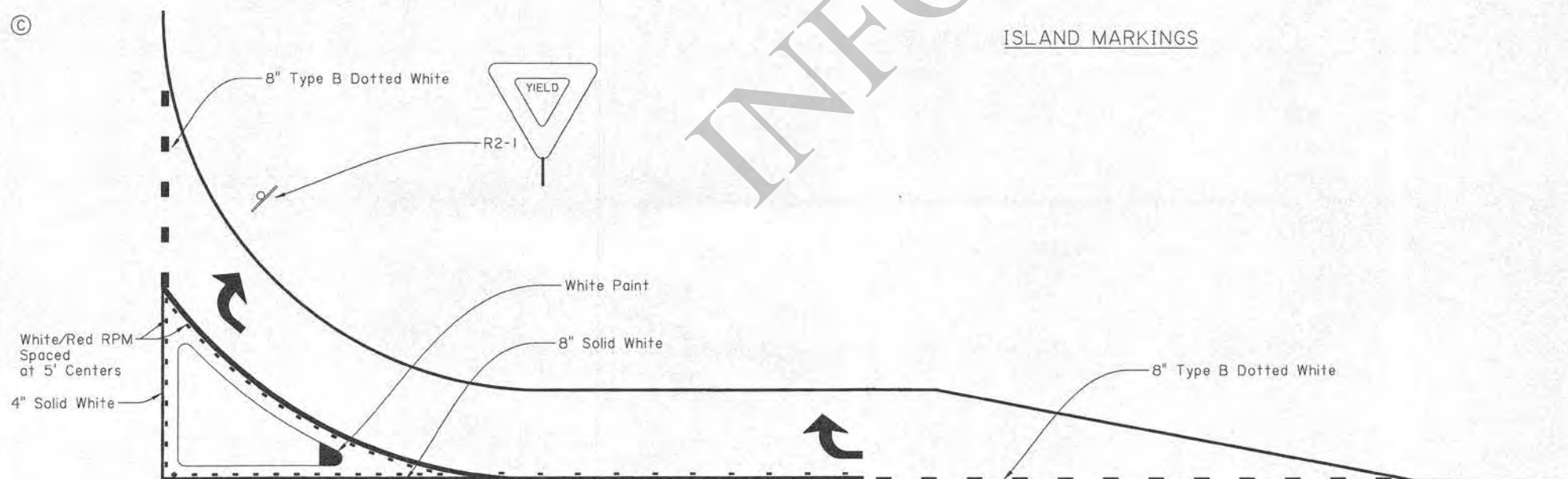


* No more than two reduction arrows shall be used per lane reduction.

85th Percentile or Speed Limit (mph)	Distance, d (ft)
20	225
25	325
30	460
35	565
40	670
45	775
50	885
55	990
60	1100
65	1200
70	1250

(C)

ISLAND MARKINGS



General Notes:

1. ➡ indicates direction of travel (not a pavement marker).
2. See PM-01 for centerline and lane line details.
3. All dotted lines are optional with DTOE Approval.
4. White paint for island marking shall be a minimum of 2' width or as directed by DTOE.



Gary N. LeBlanc
2-27-19

SHEET NUMBER	PARISH	CONTROL SECTION	STATE PROJECT
DESIGNED G. LEBLANC CHECKED J. COLVIN	DETAILED K. WILLIAMS CHECKED G. LEBLANC	DATE	SHEET

DATE 2/28/19

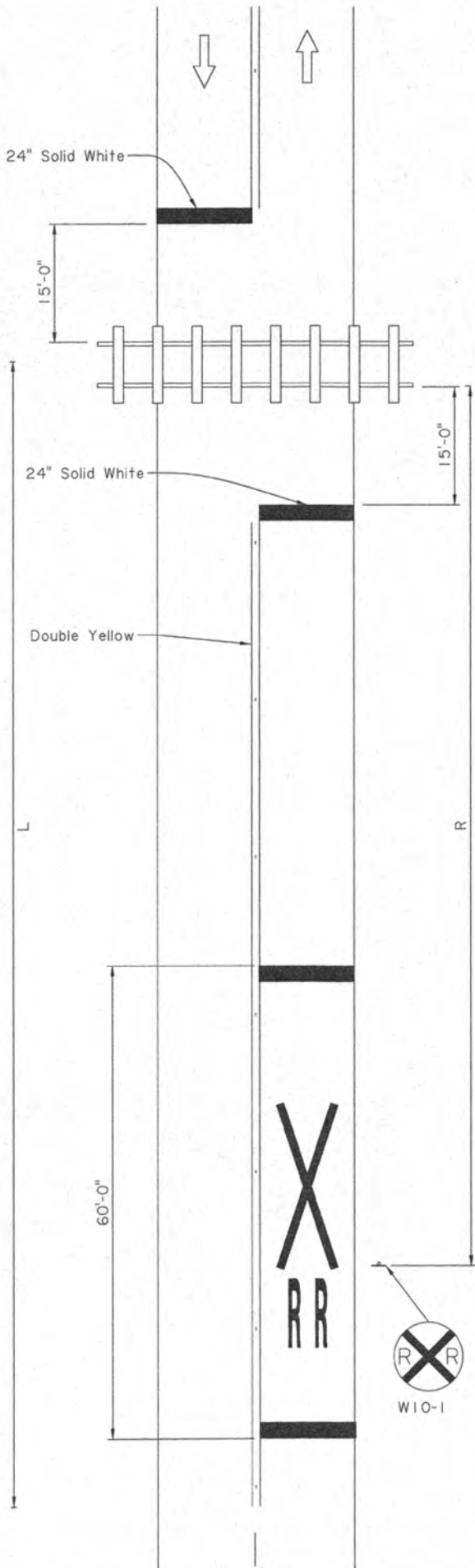
APPROVED BY
CHIEF ENGINEER
Christina P. Hight



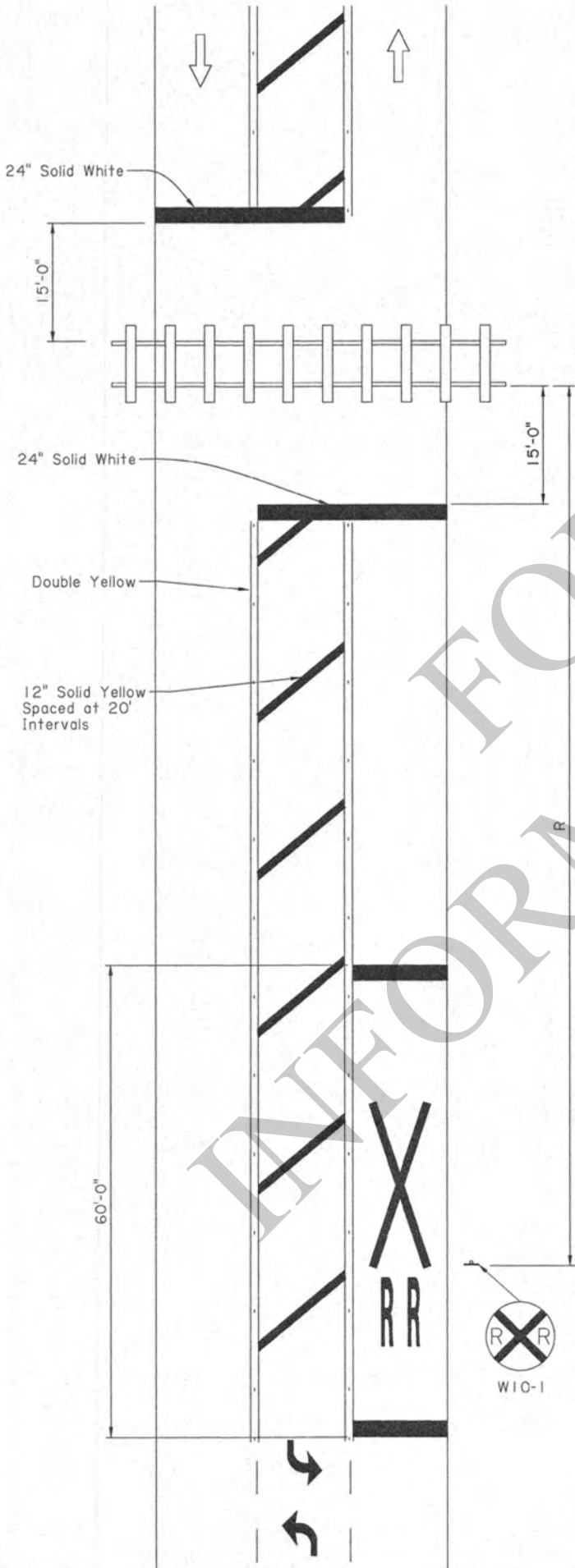
PM-06
Lane Reduction and Island Layouts
PAVEMENT MARKING DETAILS



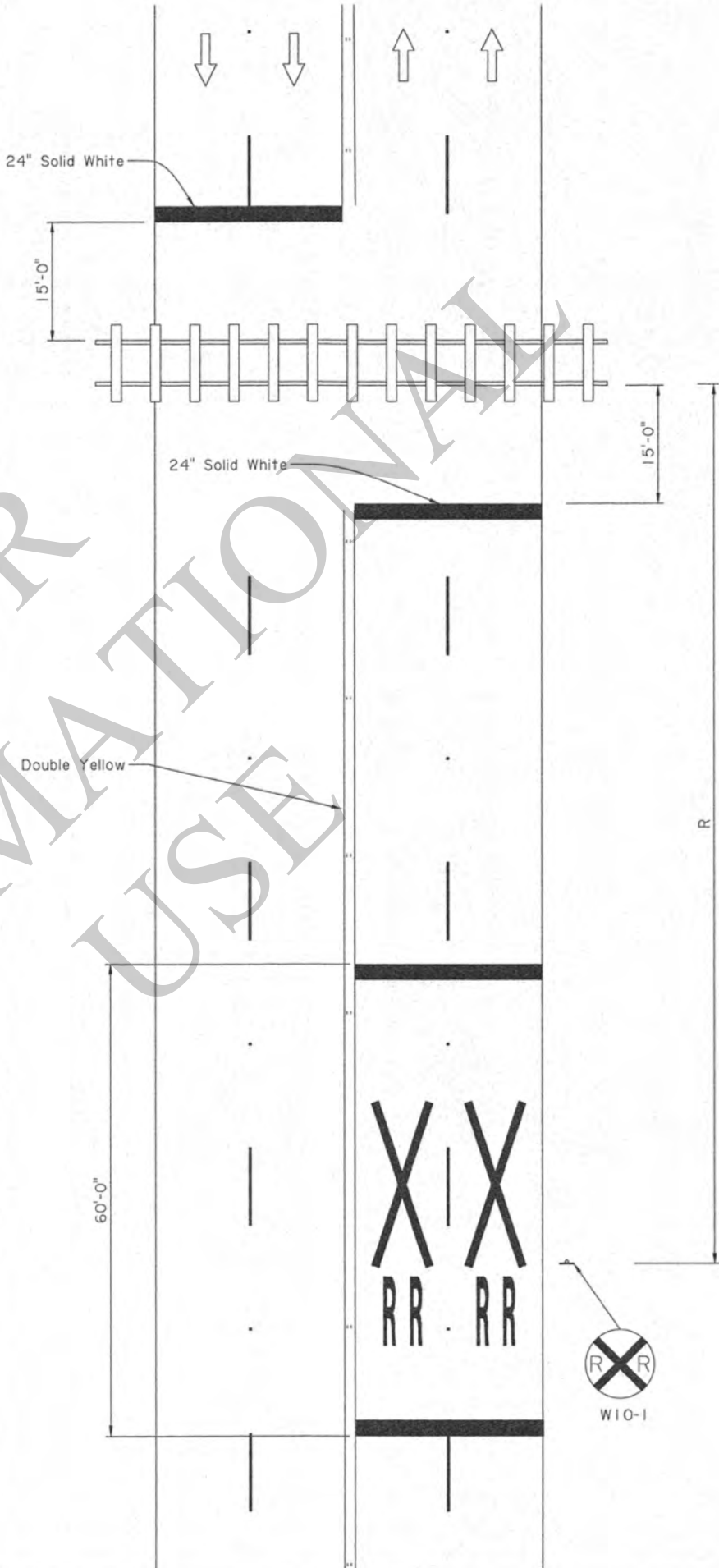
TWO-LANE ROADWAY



THREE-LANE ROADWAY



FOUR-LANE ROADWAY



85th Percentile Speed or Design Speed (mph)	Length of No Passing Zone (L)
25	285'
30	315'
35	335'
40	360'
45	410'
50	460'
≥55	560'

85th Percentile Speed or Posted Speed (mph)	Advanced Placement of Warning Sign (R)
20	100'
25	100'
30	100'
35	100'
40	125'
45	175'
50	250'
55	325'
60	400'
65	475'

- Notes:
- ➡ indicates the direction of travel (not a pavement marker).
 - No Passing Zone is measured from center of tracks.

GARY N. LEBLANC
REG. NO. 28220
REGISTERED PROFESSIONAL ENGINEER
IN
LOUISIANA
2-27-19

DESIGNED BY
G. LEBLANC

CHECKED BY
J. COLVIN

DATE
2/28/19

PARISH
COLLINS

CONTROL SECTION
K. WILLIAMS

STATE
LOUISIANA

PROJECT
G. LEBLANC

SHEET
1

APPROVED BY
CHIEF ENGINEER
[Signature]

DATE
2/28/19

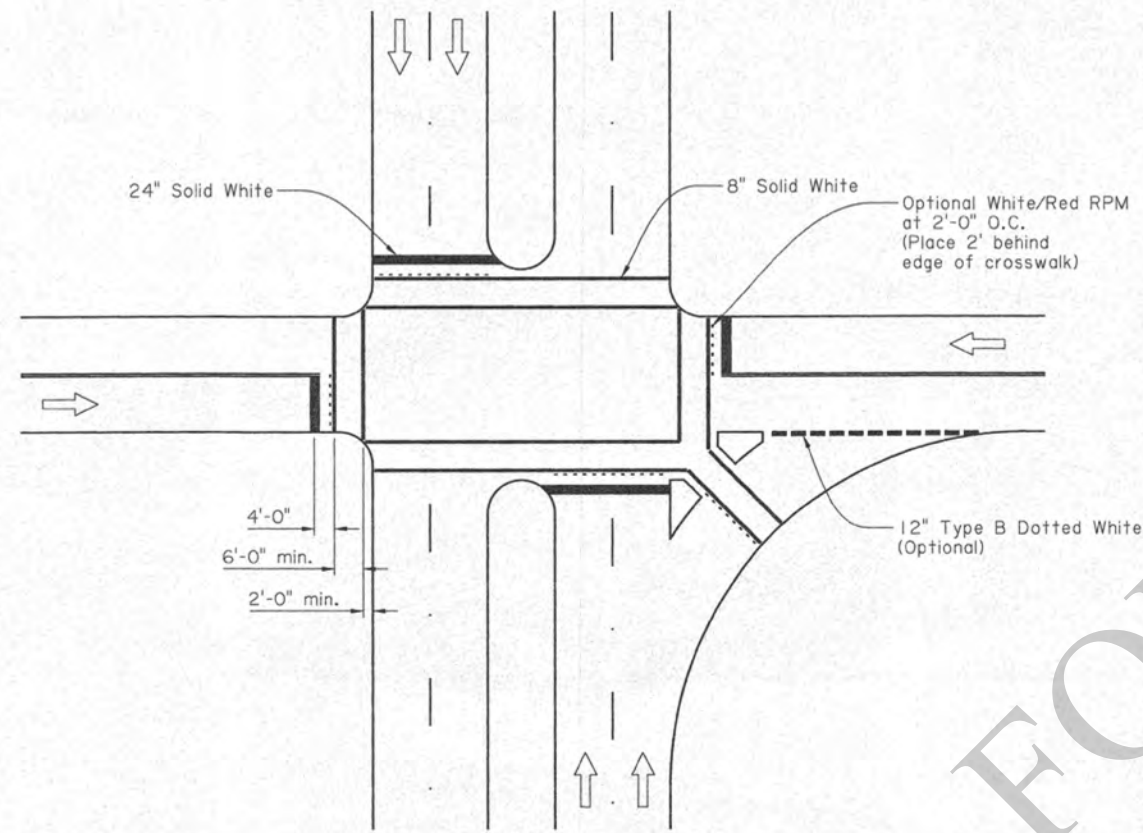
LOUISIANA
STATE ENGINEER

PM-07
Railroad Crossing Layout
PAVEMENT MARKING DETAILS

DOTD
TRAFFIC ENGINEERING

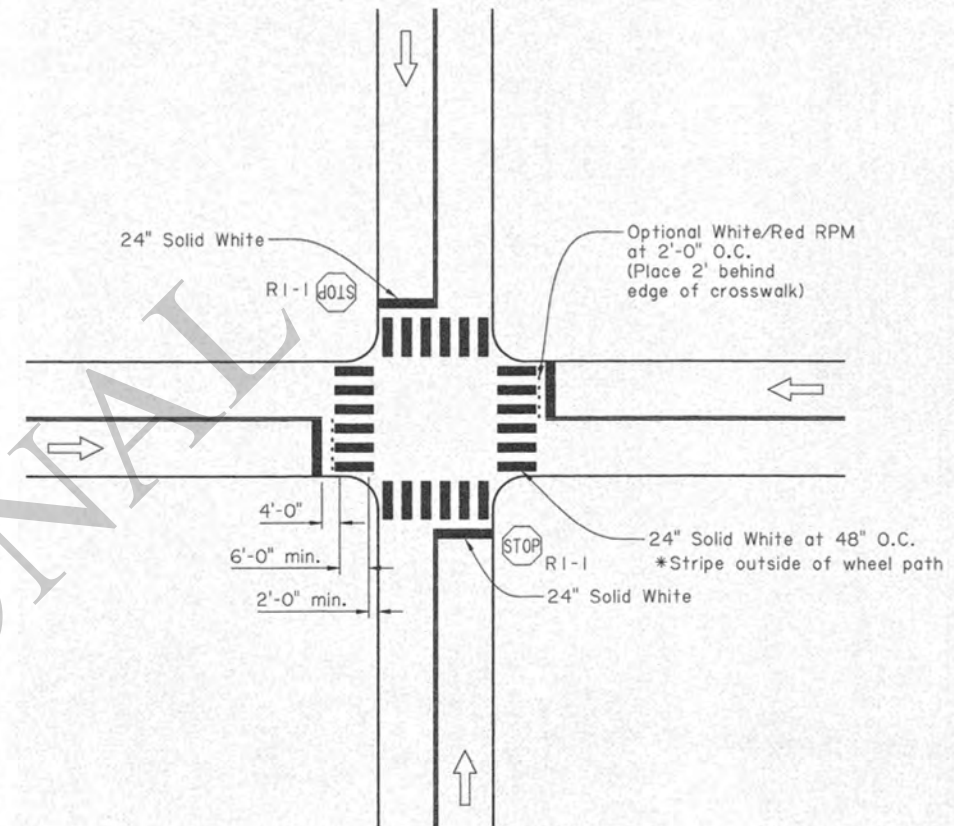
A

CROSSWALK MARKINGS AT SIGNALIZED INTERSECTION



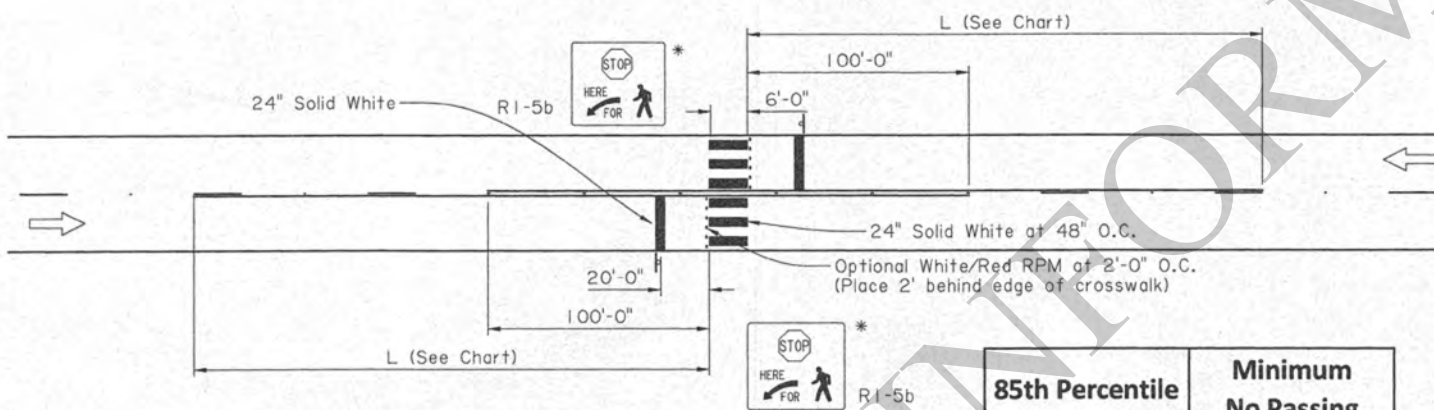
B

CROSSWALK MARKINGS AT UNSIGNALIZED INTERSECTION



C

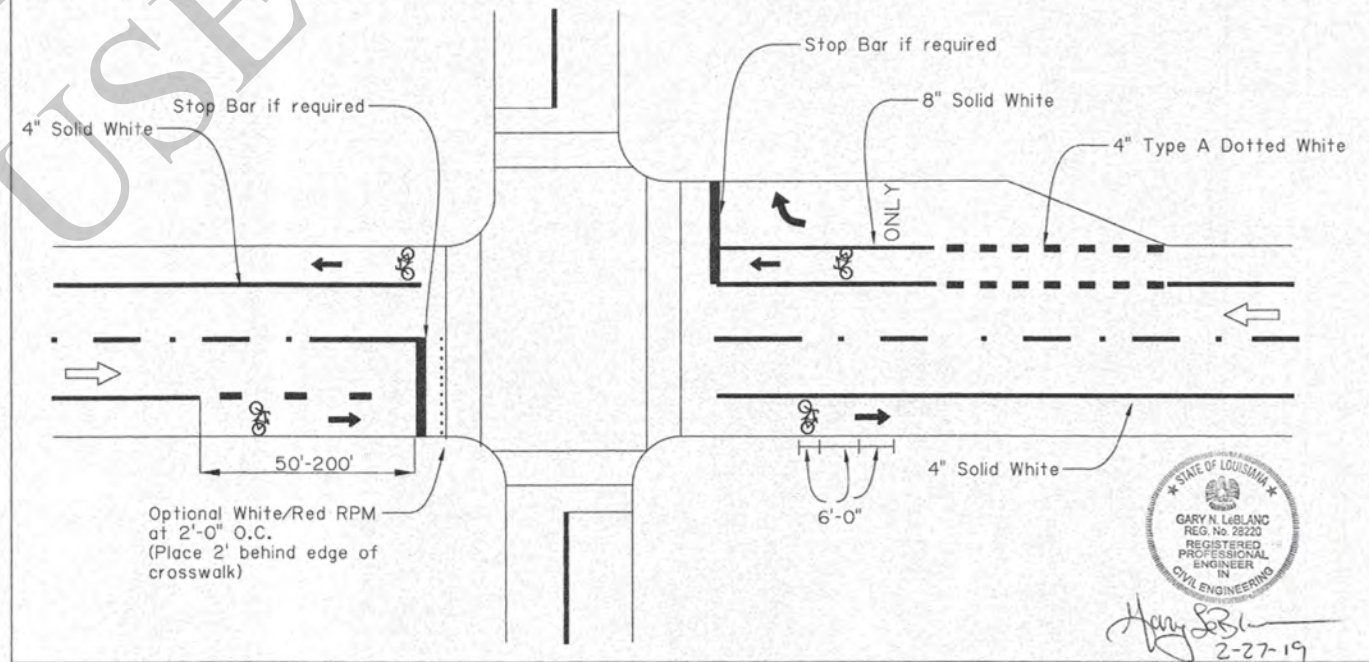
MID-BLOCK CROSSWALK MARKINGS



85th Percentile or Speed Limit (mph)	Minimum No Passing on Approach (L in feet)
25	100
30	100
35	100
40	125
45	175
50	250
55	325
60	400
65	475
70	550

D

BIKE LANE AT INTERSECTION WITH RIGHT TURN LANE

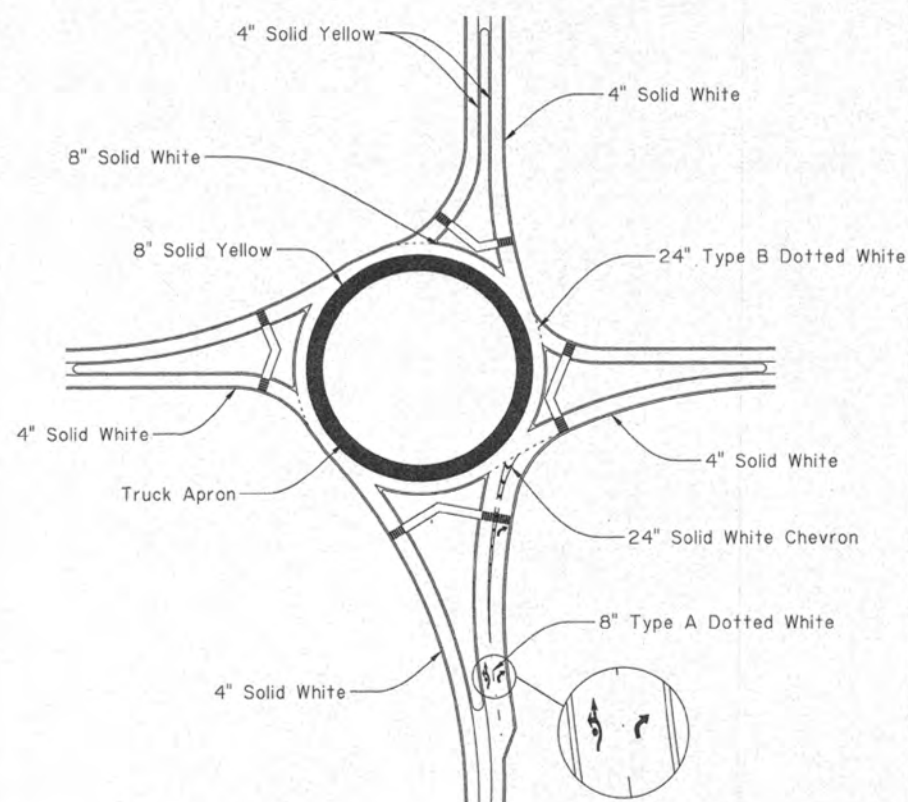


GENERAL NOTES:

- All new and existing crosswalk placement shall require approval by the DTOE and justification through an engineering study.
- If the width of the existing sidewalk is greater than 6 feet, the width of the crosswalk should match the width of the sidewalk.
- ⇒ indicates direction of travel (not a pavement marker).
- Bicycle pavement markings should be placed at the beginning of bike lanes, before and after each intersection with a minimum spacing of 100 ft in urban areas to a maximum of 1000 feet in suburban areas.

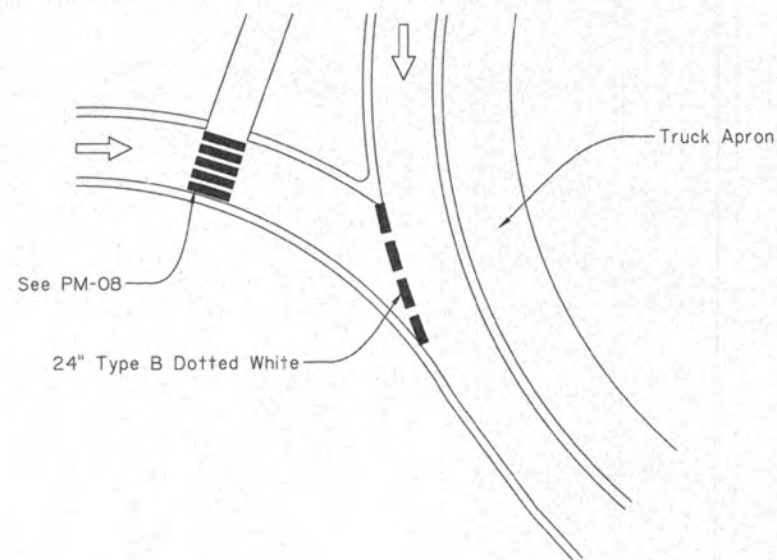
SHEET NUMBER	PARISH	CONTROL SECTION	STATE	PROJECT
DESIGNED G. LEBLANC	CHECKED J. COLVIN	DATE 2/28/19	SHEET	
APPROVED BY CHIEF ENGINEER GARY N. LEBLANC REG. No. 28220 REGISTERED PROFESSIONAL ENGINEER IN CIVIL ENGINEERING				
PM-08	Pedestrian/Bike Striping Layout			
PAVEMENT MARKING DETAILS				
TRAFFIC ENGINEERING				

(A) ONE-LANE ROUNDABOUT



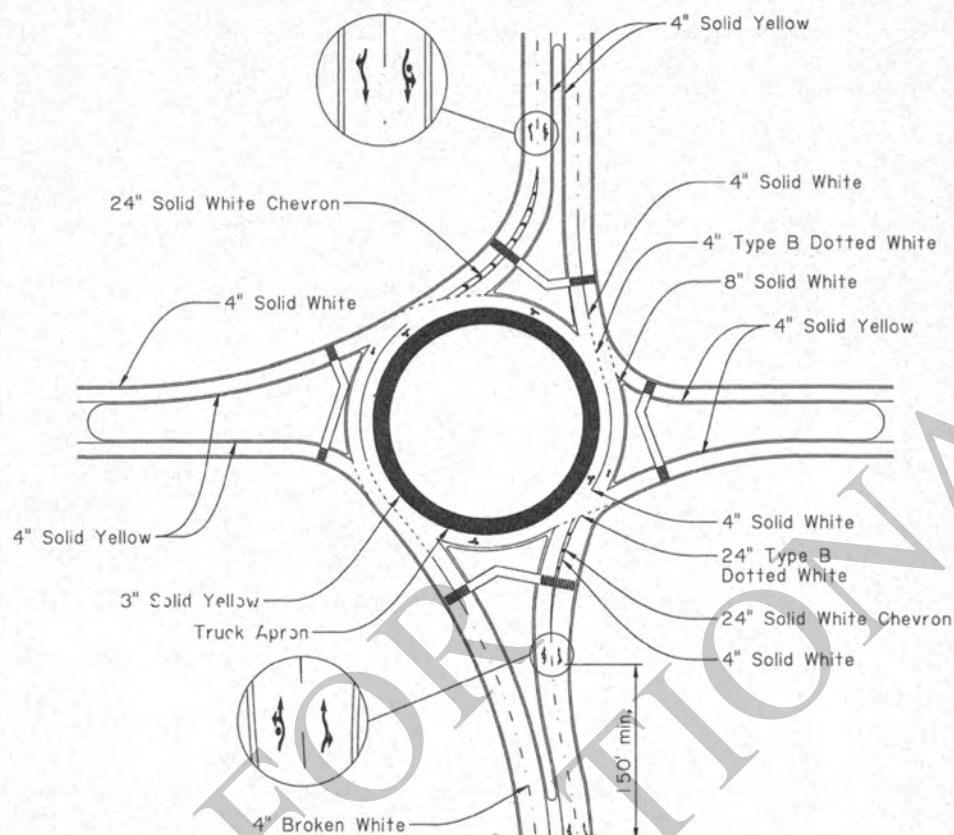
Note: No arrow pavement markings are to be used on single lane approaches.

④ APPROACH DETAILS

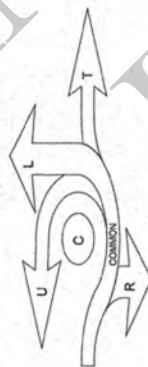


Note: ➡ indicates direction of travel (not a pavement marker).

⑤ TWO-LANE ROUNDABOUT WITH ONE AND TWO LANE APPROACHES



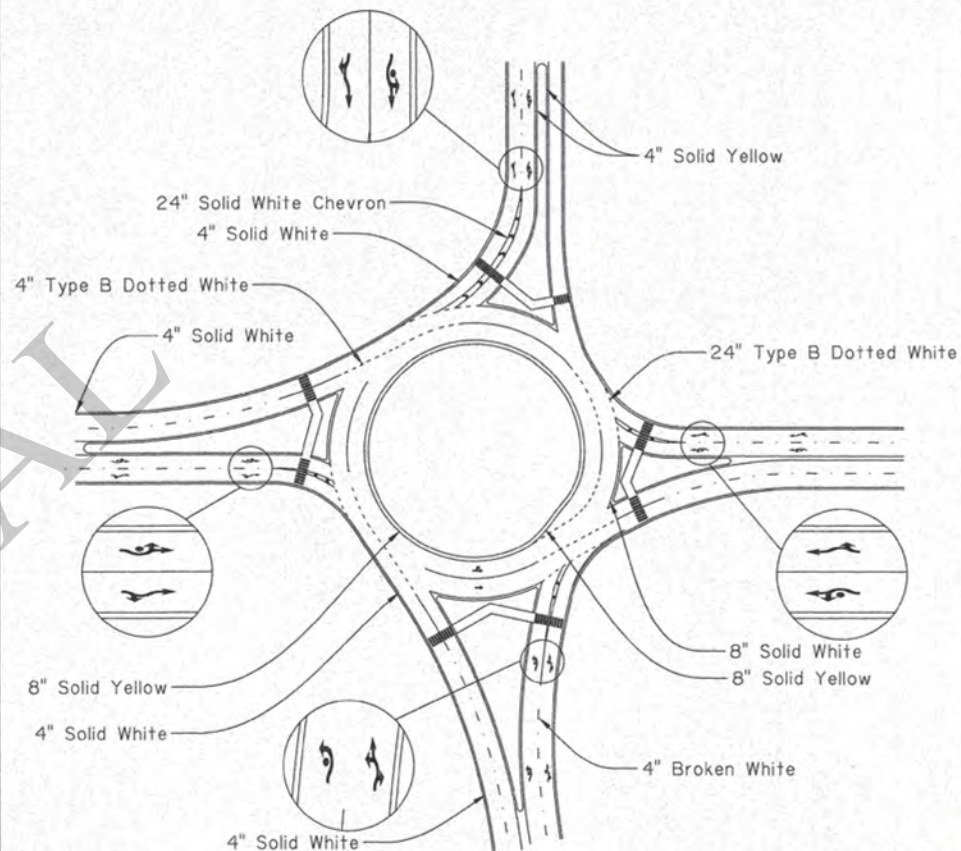
COMPONENT KEY



The labeled areas above correspond to the portions needed for each type of roundabout traffic arrow.

"C" should only be used in the inside lane.

© TWO-LANE ROUNDABOUT



GENERAL NOTES:

1. Each roundabout approach shall have two sets of arrows. The first set shall be located at the guide sign. The second set shall be located at the theoretical gore of the splitter island.
2. Crosswalks shall be placed a minimum of 20 feet from the edge line of the circulatory roadway. See PM-08 for crosswalk details.
3. See PM-02 for fishhook details.
4. See PM-06 for island details.



2-27-19

NOTE:

THE LENGTH SHOWN FOR R.C. BOX CULVERTS ON PROJECT PLANS IS MEASURED INSIDE TO INSIDE OF HEADWALLS. IF PRECAST R.C. BOX CULVERTS ARE USED THE ACTUAL BARREL LENGTH REQUIRED WILL BE THE LENGTH INSIDE HEADWALLS LESS 2'-0" MINIMUM PER END.

2" MAX. SPACE ALLOWED BETWEEN PRECAST UNITS, IF NECESSARY. TO BE END BLOCKED AND FILLED WITH SAND OR FLOWABLE FILL. COST TO BE INCLUDED IN COST OF PRECAST RCB.

IF HEADWALLS AND WINGWALLS ARE REQUIRED, SEE APPROPRIATE RCB STANDARD PLAN FOR DETAILS AND QUANTITIES.

IF HEADWALLS AND WINGWALLS ARE REQUIRED, SEE APPROPRIATE RCB STANDARD PLAN OR SPECIAL DETAIL FOR DETAILS AND QUANTITIES.

REQUIRED CAST-IN-PLACE R.C. BOX SEE APPROPRIATE RCB STANDARD PLAN

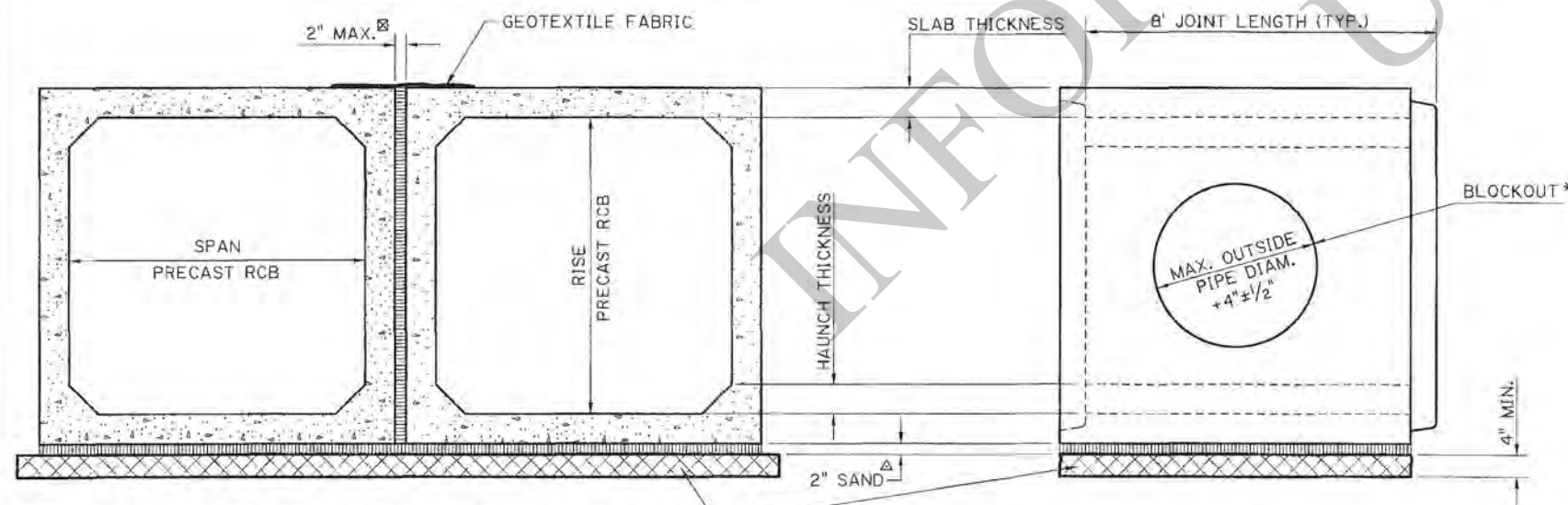
CAST-IN-PLACE RCB

PLAN SHOWING MULTIPLE PRECAST RCB CULVERTS ON A SKEWED CROSSING WITH HEADWALLS

PLAN SHOWING MULTIPLE PRECAST RCB CULVERTS ON A STRAIGHT (90°) CROSSING WITH HEADWALLS

GENERAL NOTES

- 1) FOR GENERAL SPECIFICATIONS OF PRECAST RCB SEE SECTION 805 AND 1016 OF THE LA DOTD STANDARD SPECIFICATIONS.
- 2) A MINIMUM 2 FOOT WIDE STRIP OF GEOTEXTILE FABRIC SHALL COVER THE ADJOINING LONGITUDINAL EDGES OF MULTI-BARREL BOXES AND JOINTS BETWEEN PRECAST UNITS. FABRIC EDGES AND ENDS SHALL BE SUITABLY SECURED. GEOTEXTILE FABRIC SPECIFICATIONS SHALL CONFORM TO THE SPECIFICATIONS FOR PIPE UNDER SECTION 1019 OF THE LA DOTD STANDARD SPECIFICATIONS. COST TO BE INCLUDED IN COST OF PRECAST RCB.
- 3) #4 DOWEL BARS, MINIMUM 20" LONG (10" EMBEDDED) AT 12" CENTERS ARE REQUIRED, TO CONNECT THE LAST PRECAST UNIT TO ANY CAST-IN-PLACE SECTION OF BOX.
- * 4) BLOCKOUTS FOR PIPE INTO PRECAST RCB'S ARE THE RESPONSIBILITY OF THE CONTRACTOR. BLOCKOUT LOCATIONS ARE AS DIRECTED BY THE PROJECT ENGINEER. BLOCKOUT SHALL NOT BE GREATER THAN 1/2 THE RISE OF PRECAST RCB AND SHALL NOT BE LOCATED IN THE HAUNCH.
- 5) IN ADDITION TO BEDDING MATERIAL, A MINIMUM 4 INCH THICK, CLASS R CONCRETE, WORKING TABLE WILL BE REQUIRED FOR 6' X 6' AND LARGER PRECAST RCB FIELD INSTALLATIONS. AN ADDITIONAL 2 INCHES OF SAND SHALL BE PLACED AND LEVELED UPON THE CONCRETE WORKING TABLE. COST OF WORKING TABLE AND SAND TO BE INCLUDED IN COST OF PRECAST RCB.
- 6) FOR THE CAST-IN-PLACE PORTIONS OF THE CULVERT, THE REBAR SIZE AND SPACING SHALL MATCH OR EXCEED THE PRECAST SECTIONS. CONTRACTOR TO USE APPROVED PRECAST RCB SHOP DRAWING FOR REBAR REQUIREMENTS.
- 7) WALL AND SLAB THICKNESSES MAY VARY IN THE TRANSITION AREA BETWEEN THE LAST PRECAST UNIT AND THE CAST-IN-PLACE SECTION OF THE BOX AND HEADWALL. CONTRACTOR SHALL MAKE ADJUSTMENTS TO THE DIMENSIONS AND QUANTITIES OF REINFORCING STEEL AND CONCRETE IN THE CAST-IN-PLACE SECTIONS AS NECESSARY AT NO ADDITIONAL COST.



SECTION A-A

SIDE ELEVATION OF PIPE JOINT SHOWING MAXIMUM BLOCKOUT AND PIPE DIAMETER

SHEET NUMBER		DATE	
DESIGN	CHECK	DETAIL	REVIEW
FABRICATION		STATE PROJECT	
CONTRACT SECTION		SERIES	
OF		OF	

Mitra Hashemieh
7/19/2022

APPROVED BY CHIEF ENGINEER:

[Signature] 7/20/2022

DATE:

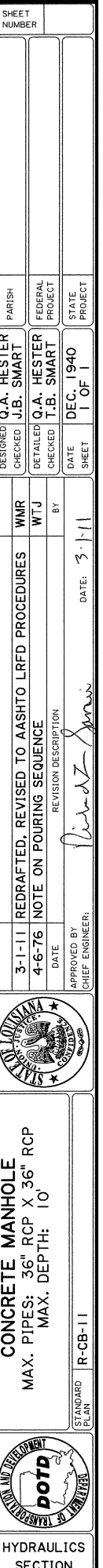
PRECAST REINFORCED CONCRETE BOX CULVERTS

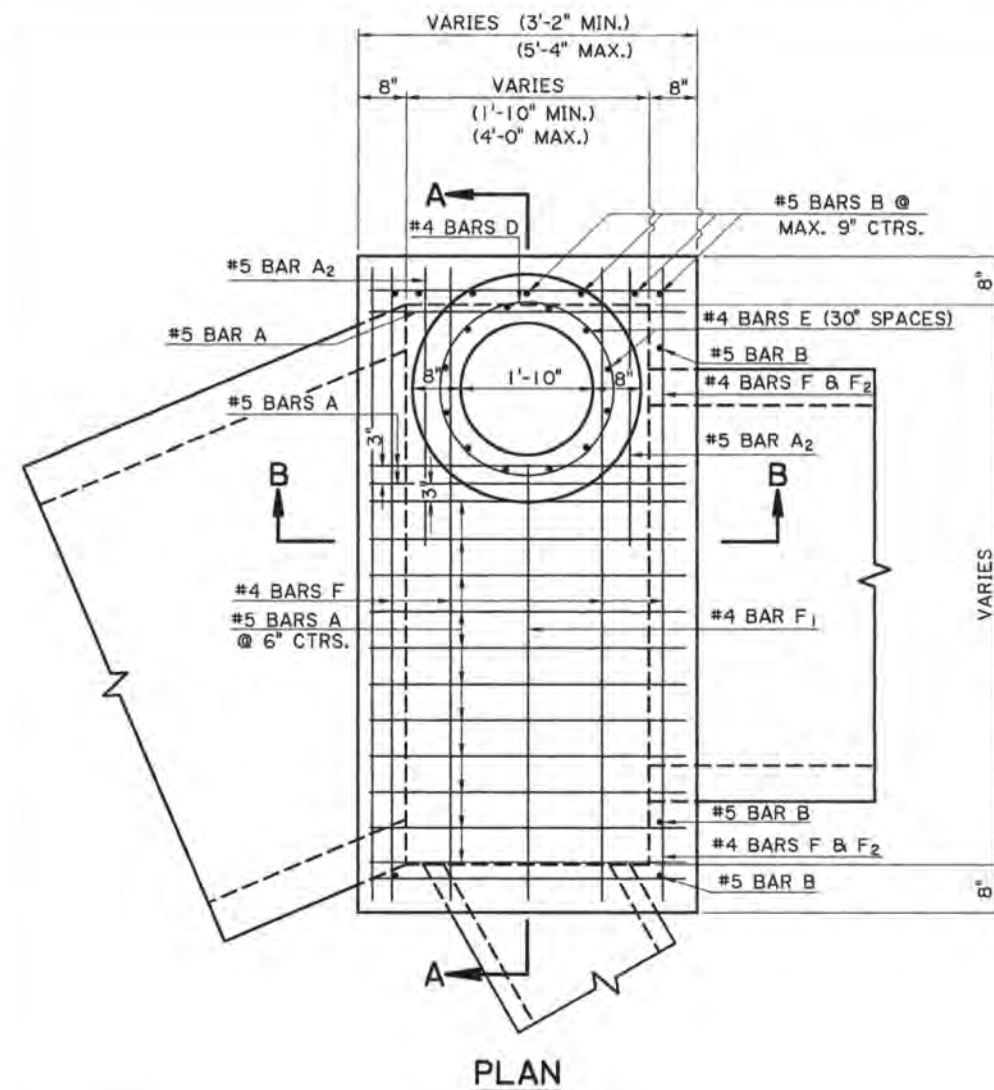
DETAILS AND SPECIFICATIONS

PROB-01

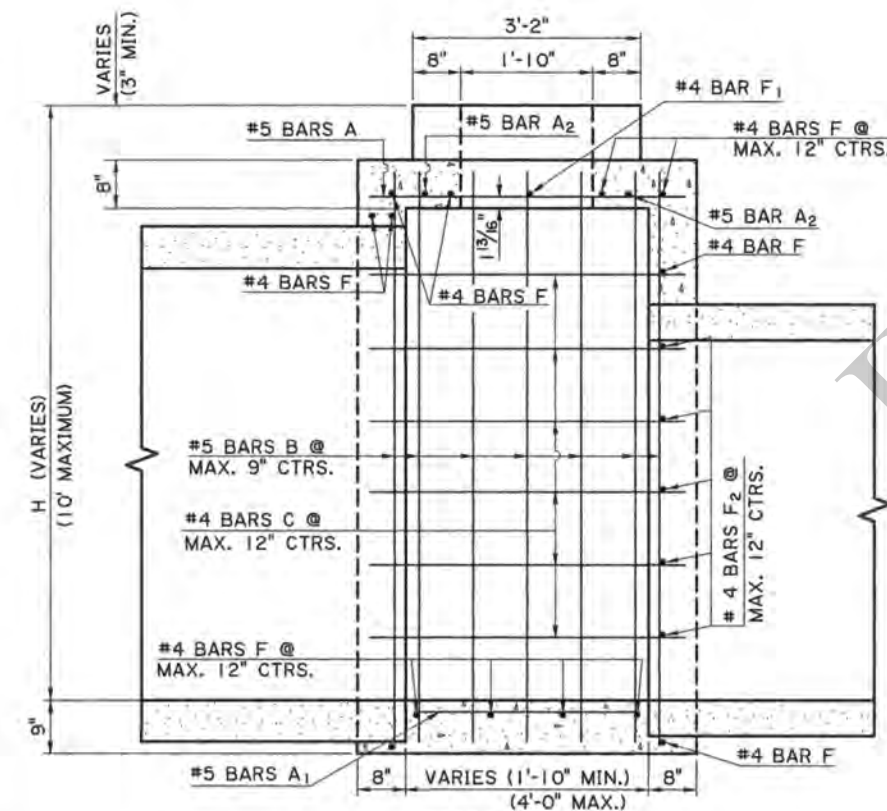
DOTD
LOUISIANA DEPARTMENT OF TRANSPORTATION & DEVELOPMENT

HYDRAULICS SECTION

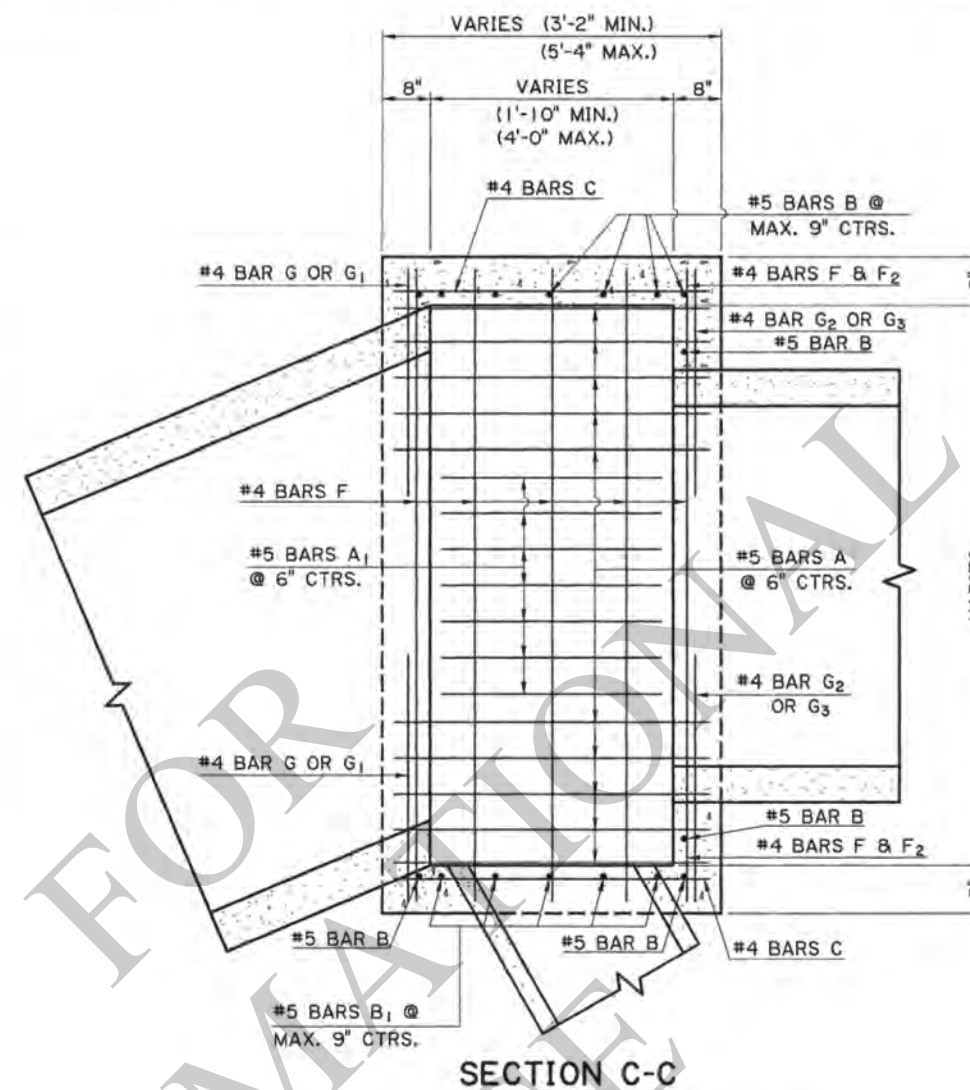




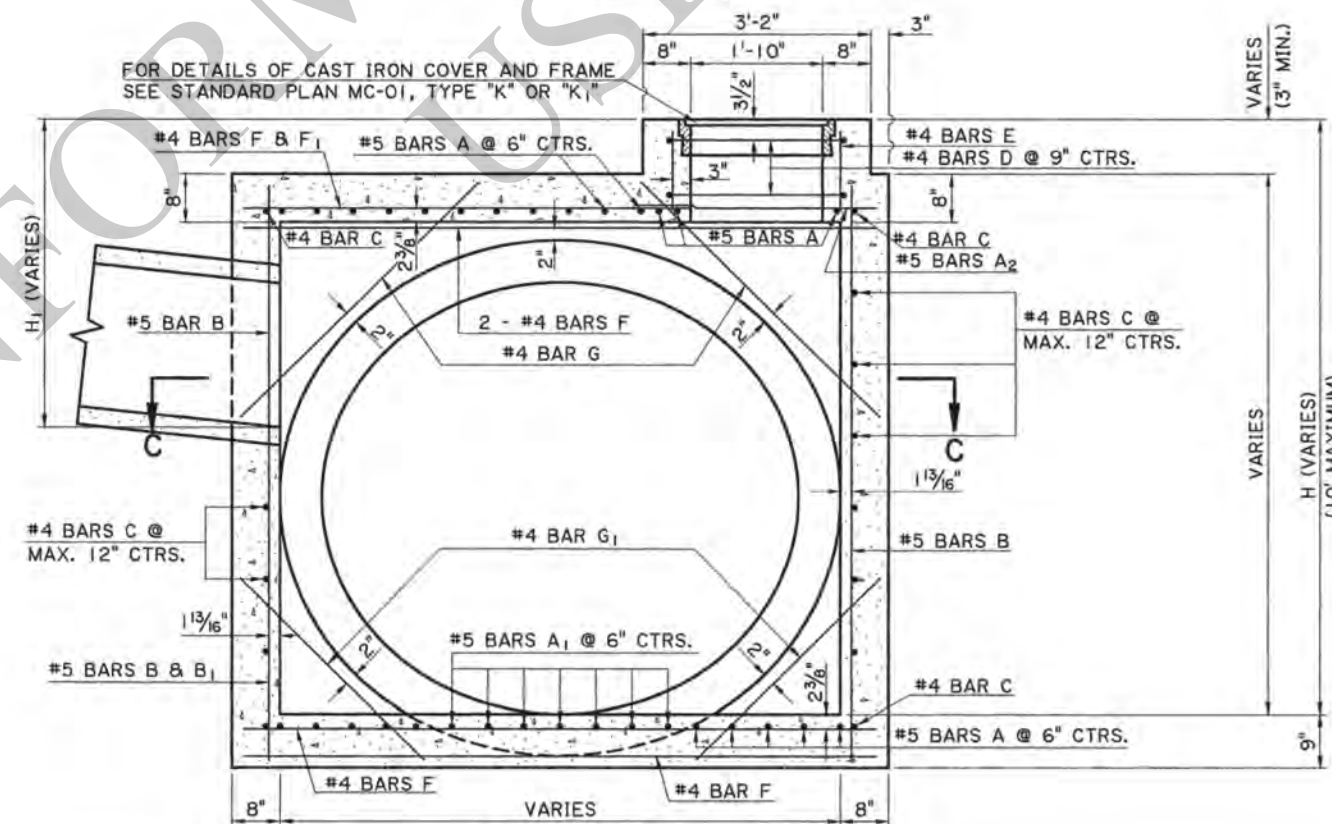
PLAN



SECTION B-B



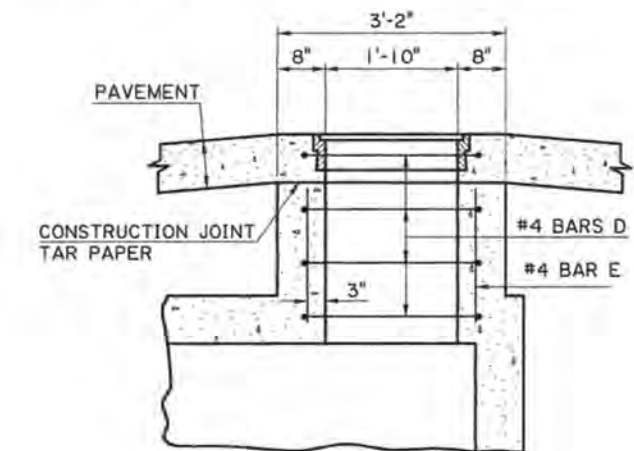
SECTION C-C



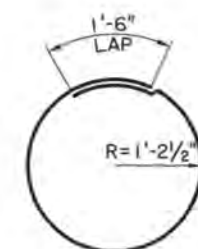
SECTION A-A

GENERAL NOTES:

1. MANHOLE IS DESIGNED ACCORDING TO 4TH ED. 2007 AASHTO LRFD PROCEDURES. SECTION 702 OF THE DOTD STANDARD SPECIFICATIONS SHALL APPLY.
2. CONCRETE: ALL CONCRETE SHALL BE CLASS "M" MINOR STRUCTURE. ALL EXPOSED EDGES SHALL BE CHAMFERED $\frac{3}{4}$ IN. EXCEPT AS NOTED.
3. REINFORCING STEEL: REINFORCING STEEL SHALL BE GRADE 60. DIMENSIONS ARE TO BAR CENTERS. MINIMUM COVER FOR REINFORCING BARS SHALL BE 2 IN. CLEAR UNLESS SHOWN OTHERWISE.
4. SEE "DETAIL A" FOR DETAILS OF MANHOLE IN A PAVEMENT AREA.
5. THE CONTRACTOR WILL NOT POUR ABOVE THE BOTTOM OF THE SLAB UNTIL THE PAVING ADJACENT TO THE MANHOLE HAS BEEN COMPLETED.

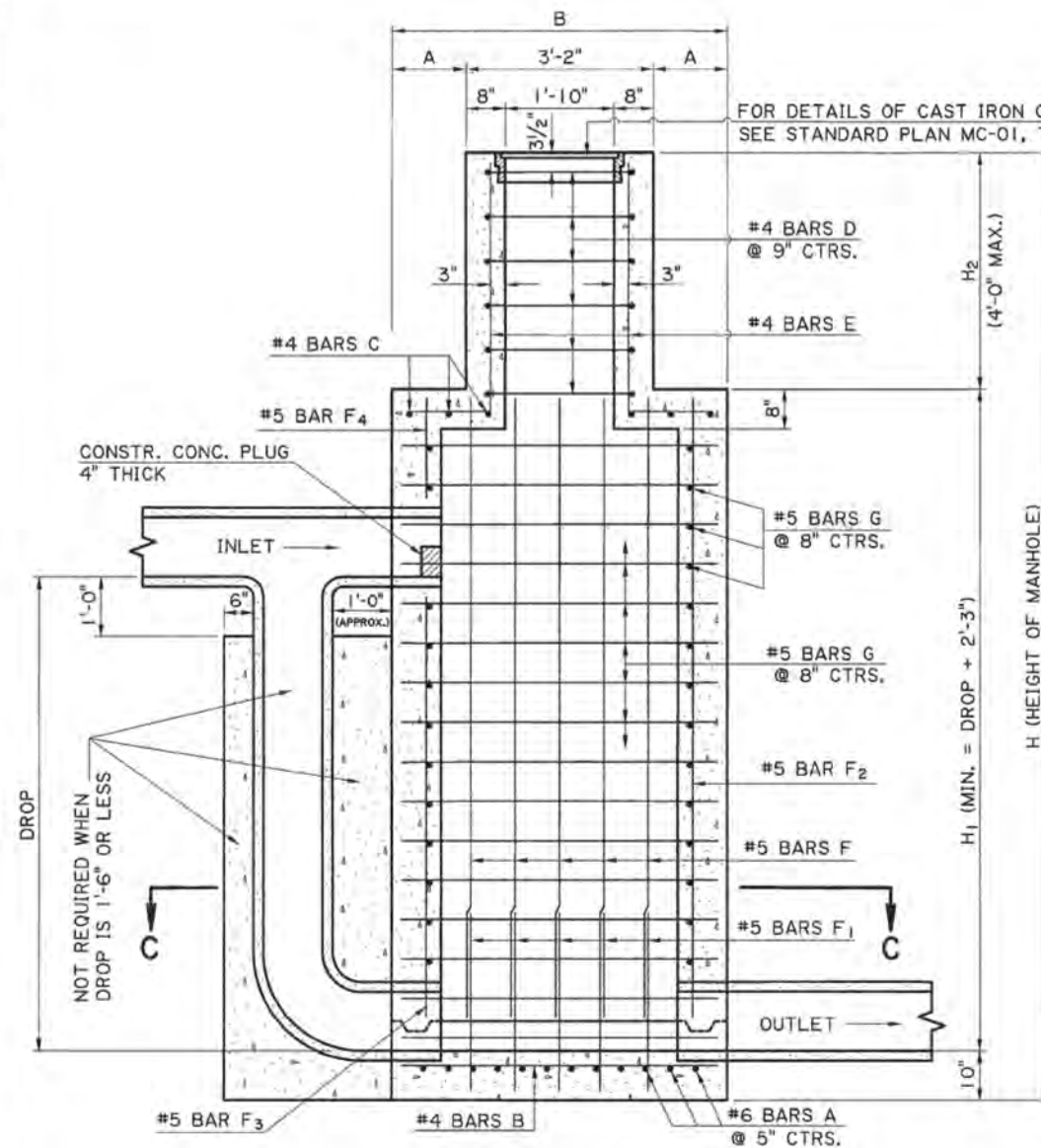


DETAIL A
(MANHOLE IN PAVEMENT AREA)



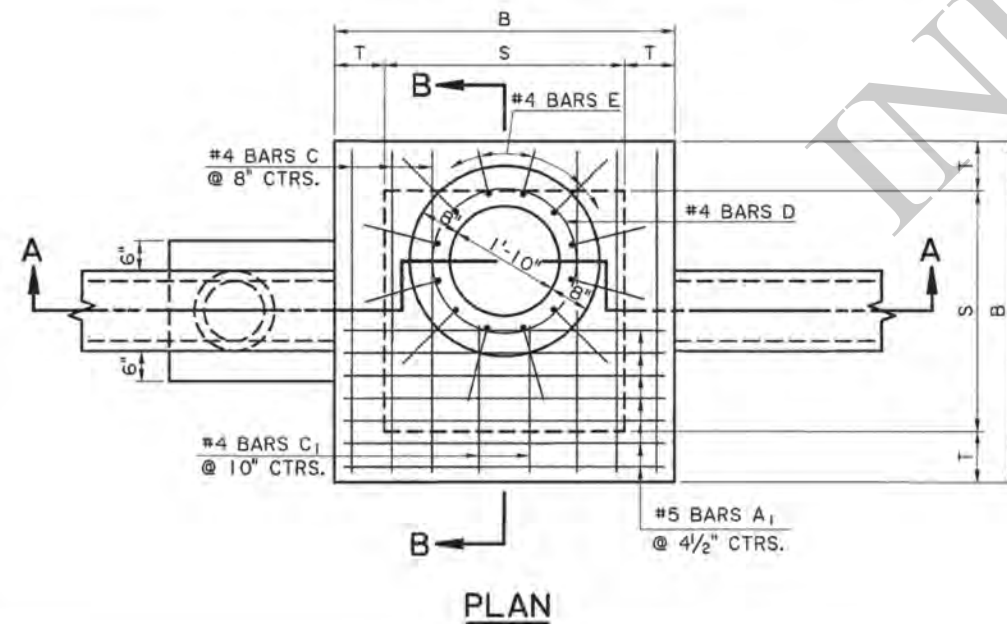
#4 BAR D

	CONCRETE MANHOLE MAX. PIPE: 36" RCP X OPEN MAX. DEPTH: 10'		REVISION DESCRIPTION		DESIGNED CHECKED	PARTIAL	SHEET NUMBER
			DATE APPROVED BY CHIEF ENGINEER:	BY DATE: 3-1-11	DETAILED CHECKED C. LUSK	FEDERAL PROJECT	
STANDARD PLAN		R-CB-11MOD		DATE: 5-26-54 SHEET 1 OF 1		STATE PROJECT	
HYDRAULICS SECTION							

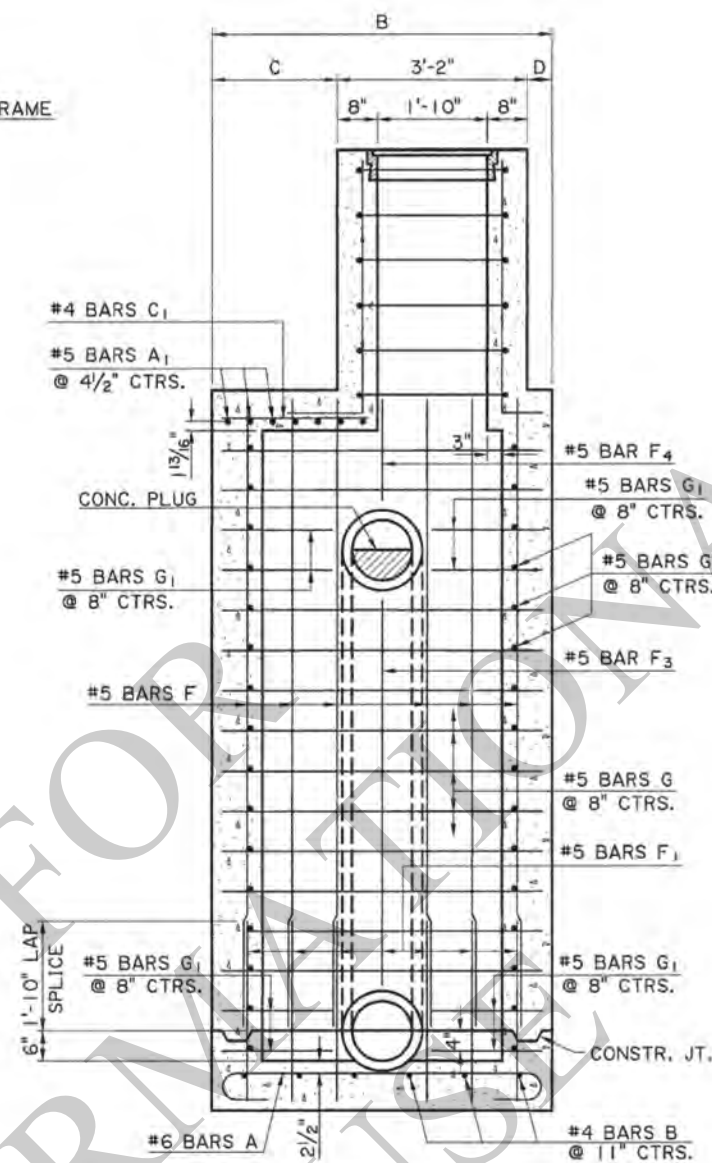


SECTION A-A

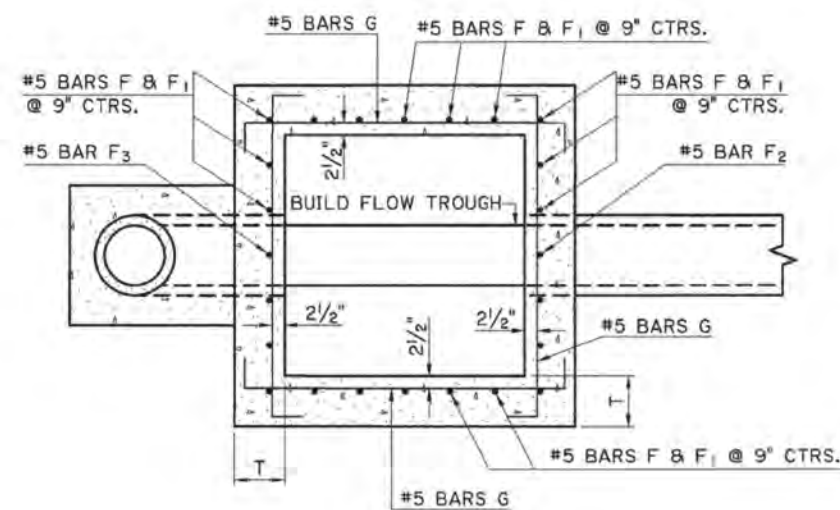
NOTE: WHEN DIFFERENCE IN F.L. ELEVATIONS OF INLET AND OUTLET (DROP) DOES NOT EXCEED 1'-6", CONNECTION OF INLET TO MANHOLE WILL BE MADE IN SAME MANNER AS THAT OF OUTLET. (VERTICAL PIPE, ELBOW AND CONCRETE ENCLOSURE NOT REQUIRED)



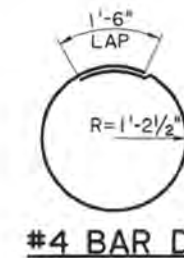
PLAN



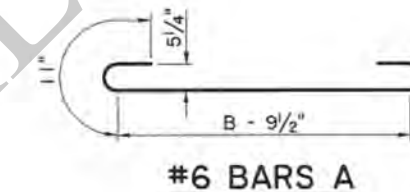
SECTION B-B



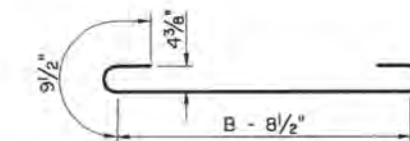
SECTION C-C



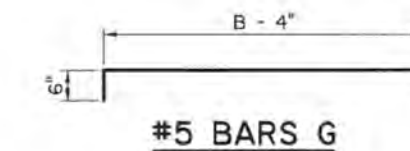
#4 BAR D



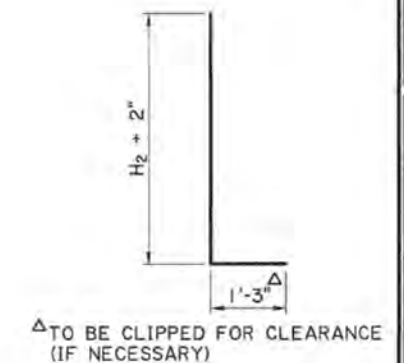
#6 BARS A



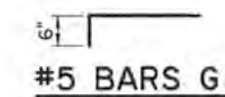
#5 BARS A₁



#5 BARS G

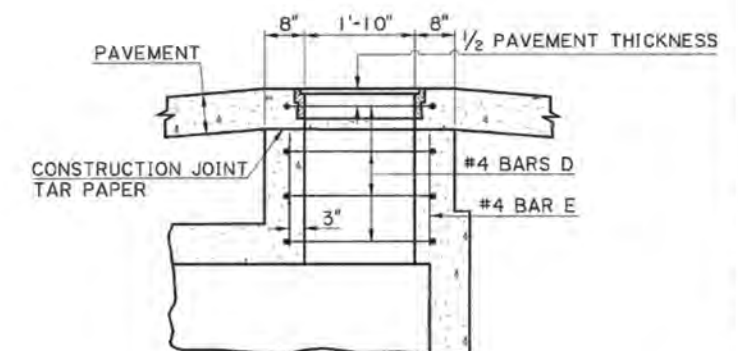


#4 BARS E



#5 BARS G₁

DIMENSIONS						
H	T	S	B	A	C	D
8" MAX.	8"	3'-6"	4'-10"	0'-10"	1'-5"	0'-3"
8'-1" - 16'	10"	4'-0"	5'-8"	1'-3"	2'-1"	0'-5"
16'-1" - 24'	12"	4'-0"	6'-0"	1'-5"	2'-3"	0'-7"

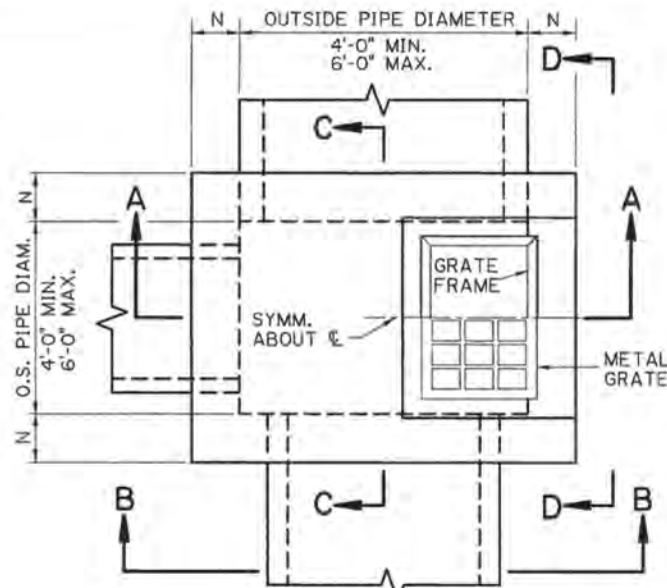


DETAIL A

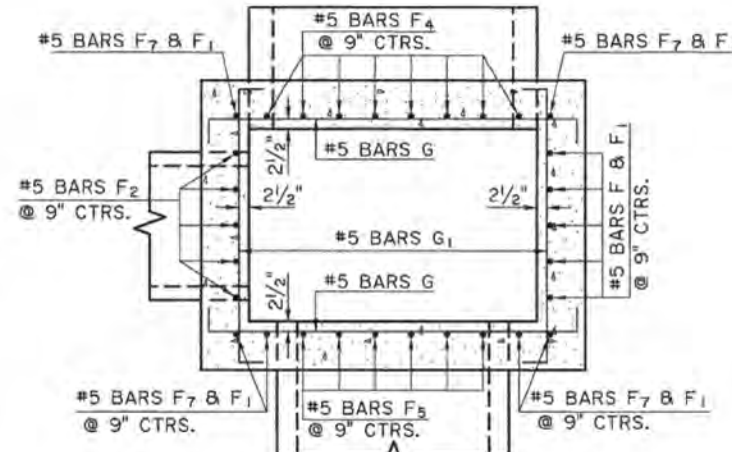
(MANHOLE IN PAVEMENT AREA)

- GENERAL NOTES:
- 1) PROJECT SPECIFICATIONS FOR MANHOLES SHALL APPLY.
 - 2) PROJECT SPECIFICATIONS FOR REINFORCEMENT SHALL APPLY FOR FURNISHING AND PLACING REINFORCING STEEL.
 - 3) DIMENSIONS RELATING TO REINFORCING STEEL ARE TO BAR CENTERS.
 - 4) SEE "DETAIL A" FOR DETAILS OF MANHOLE IN A PAVEMENT AREA.

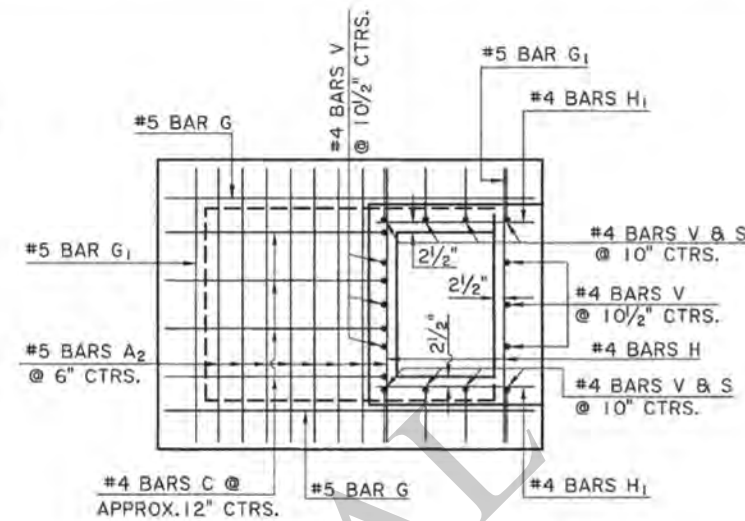
HYDRAULICS SECTION		STANDARD PLAN	R-CB-36		R.C. MANHOLE FOR SANITARY SEWER		10-22-08	REDRAFTED, REMOVED MANHOLE STEPS, NEW SHEET	JDK						
						APPROVED BY CHIEF ENGINEER,	DATE	REVISION DESCRIPTION	BY	DETAILS CHECKED	FEDERAL PROJECT	SHEET NUMBER			
							</								



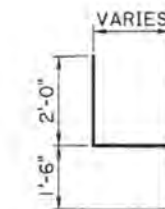
PLAN
GRATE TO BE TYPE "B" OR "C".
TYPE "B" SHOWN.



SECTION E-E
BOTTOM SLAB REINFORCING NOT SHOWN

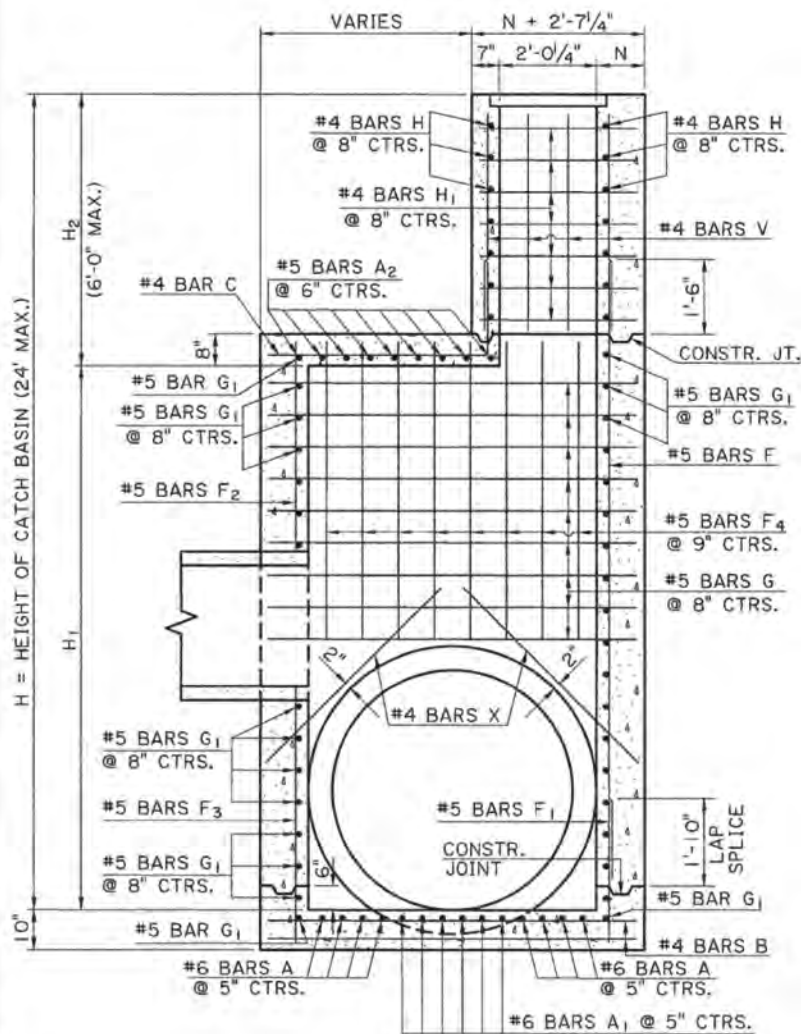


PLAN
SHOWING REINFORCING IN TOP SLAB
(FRAME AND GRATE NOT SHOWN)

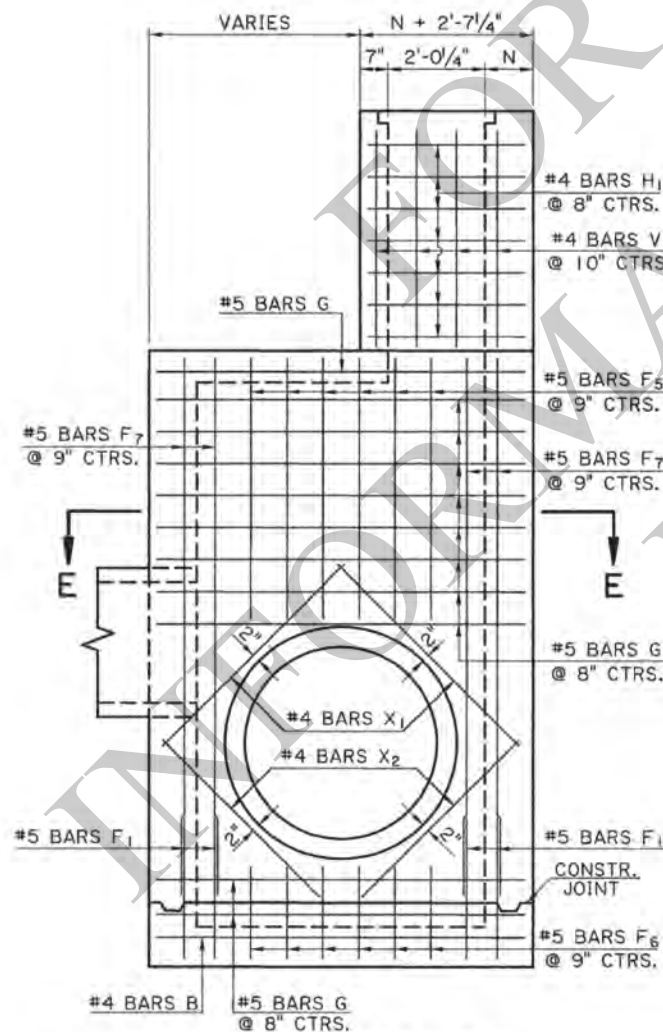


#4 BARS S

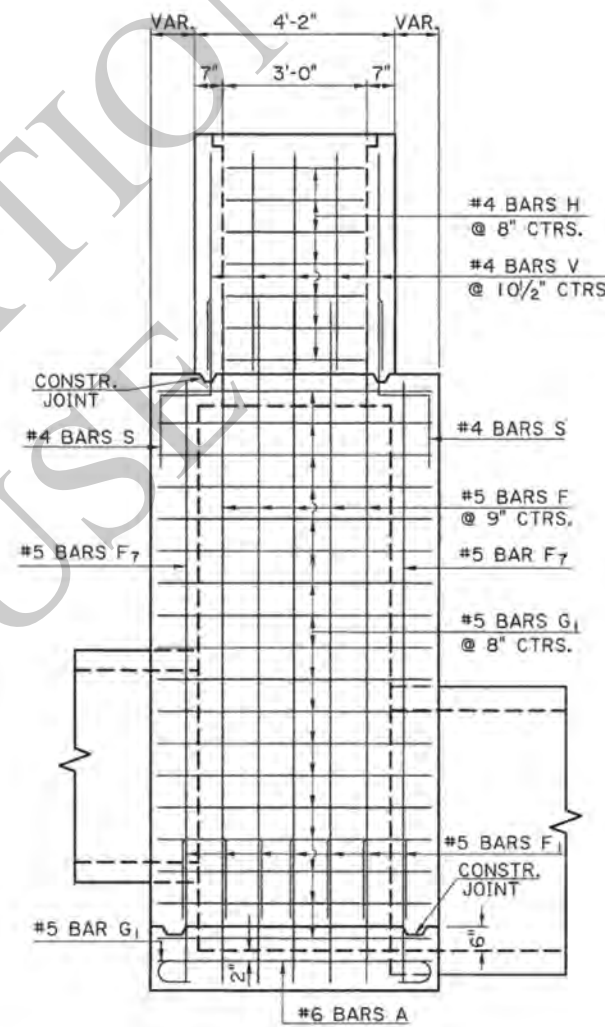
DIMENSIONS	
H	N
12'-9" TO 16'-0"	10"
16'-1" TO 24'-0"	12"



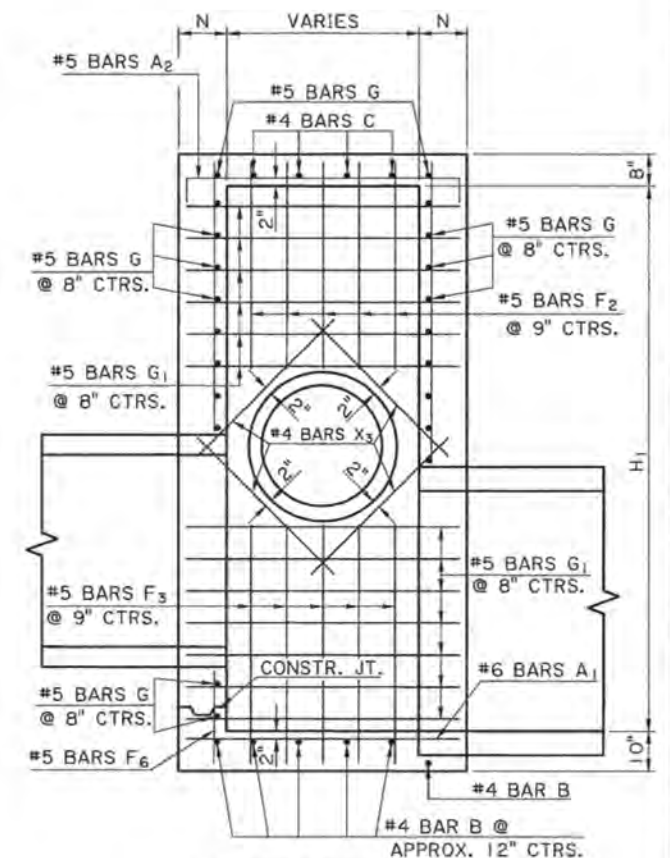
SECTION A-A



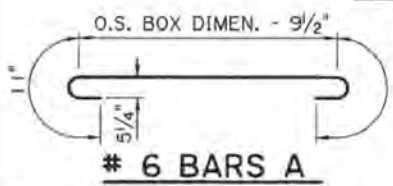
ELEVATION B-B



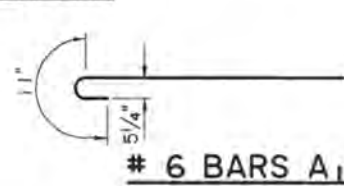
ELEVATION D-D



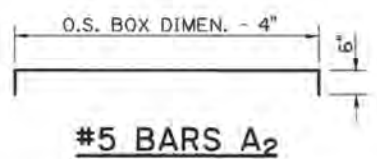
ELEVATION C-C



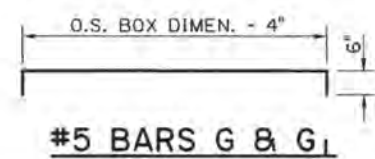
#6 BARS A



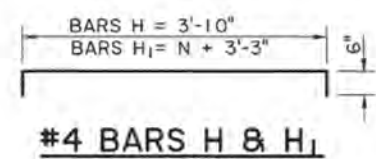
#6 BARS A1



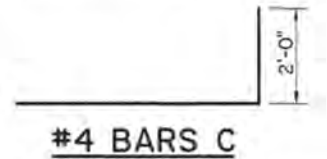
#5 BARS A2



#5 BARS G & G1



#4 BARS H & H1

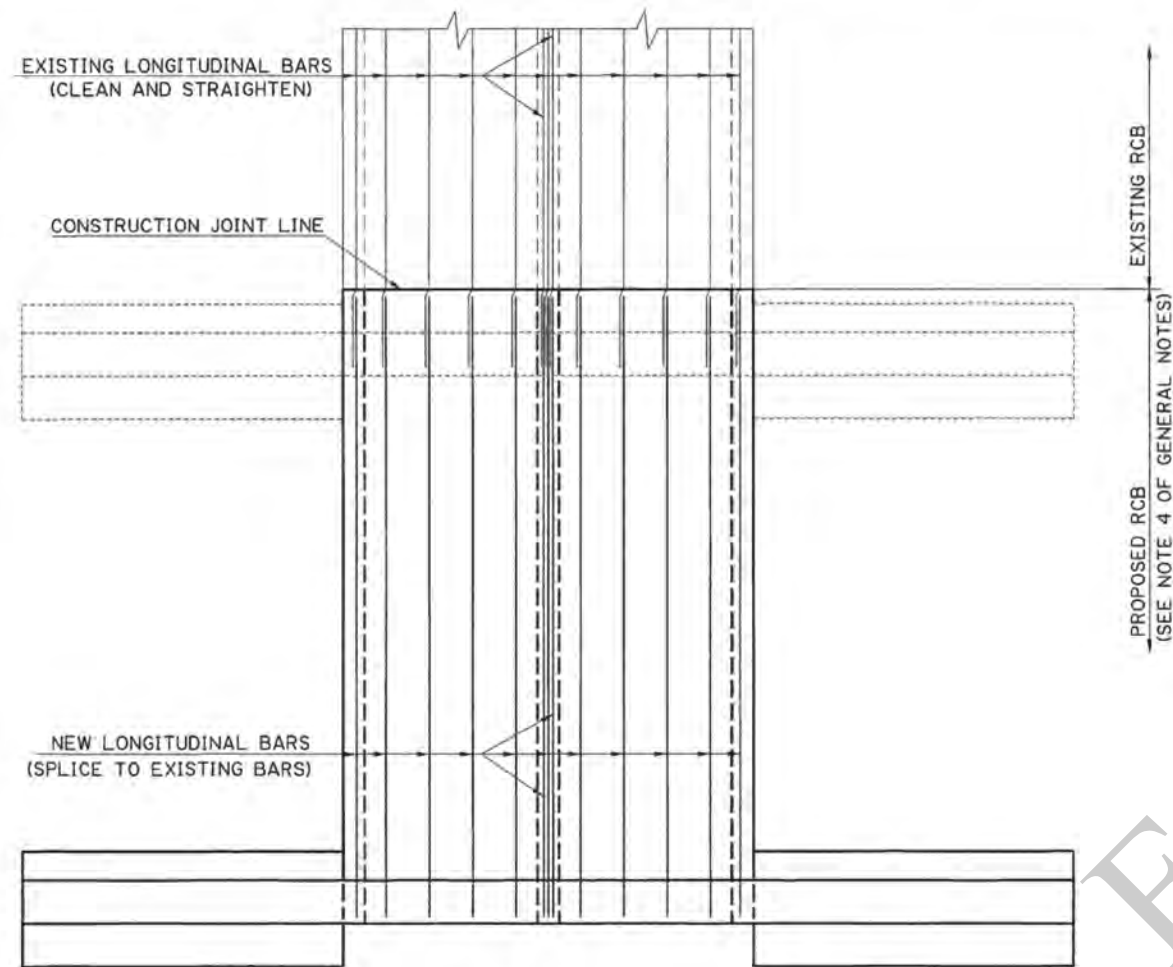


#4 BARS C

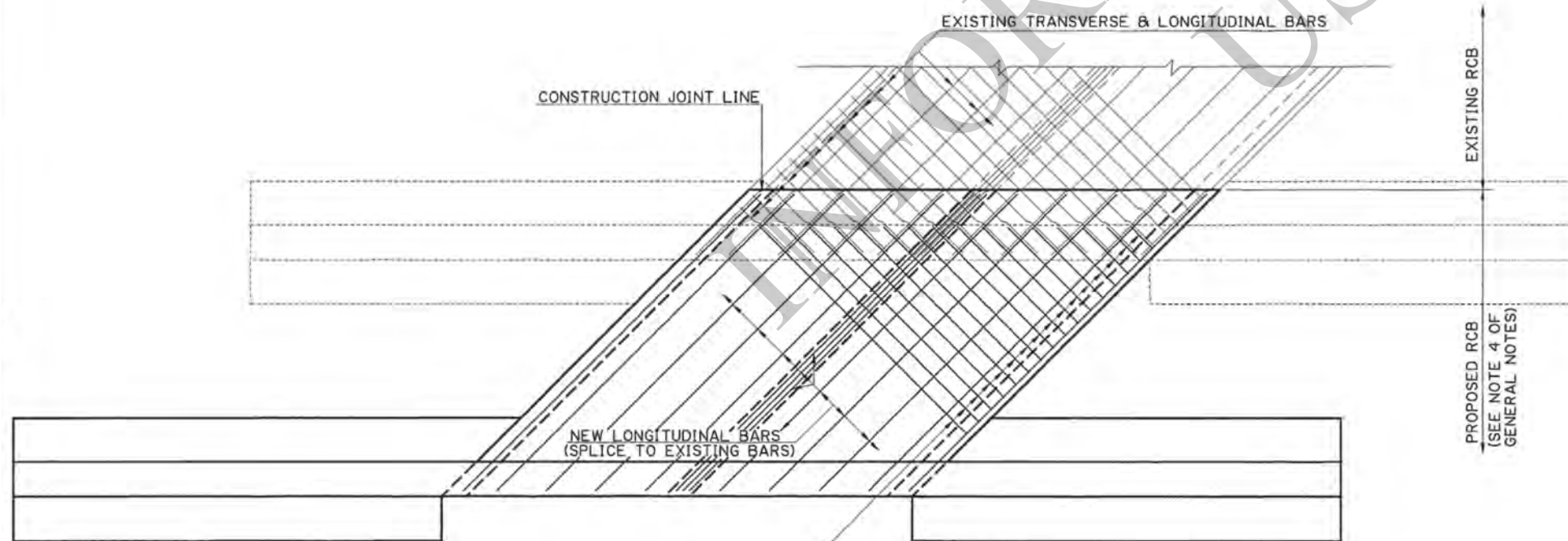
GENERAL NOTES:

- 1) PROJECT SPECIFICATIONS FOR MANHOLES SHALL APPLY.
- 2) PROJECT SPECIFICATIONS FOR REINFORCEMENT SHALL APPLY FOR FURNISHING AND PLACING REINFORCING STEEL.
- 3) DIMENSIONS RELATING TO REINFORCING STEEL ARE TO BAR CENTERS.
- 4) FOR DETAILS OF GRATE AND FRAME, SEE STANDARD PLAN MC-01 (TYPE "B" OR "C"). TYPE "B" GRATE TO BE USED WHERE NO PEDESTRIAN TRAFFIC IS EXPECTED. TYPE "C" GRATE TO BE USED WHERE PEDESTRIAN TRAFFIC IS EXPECTED.

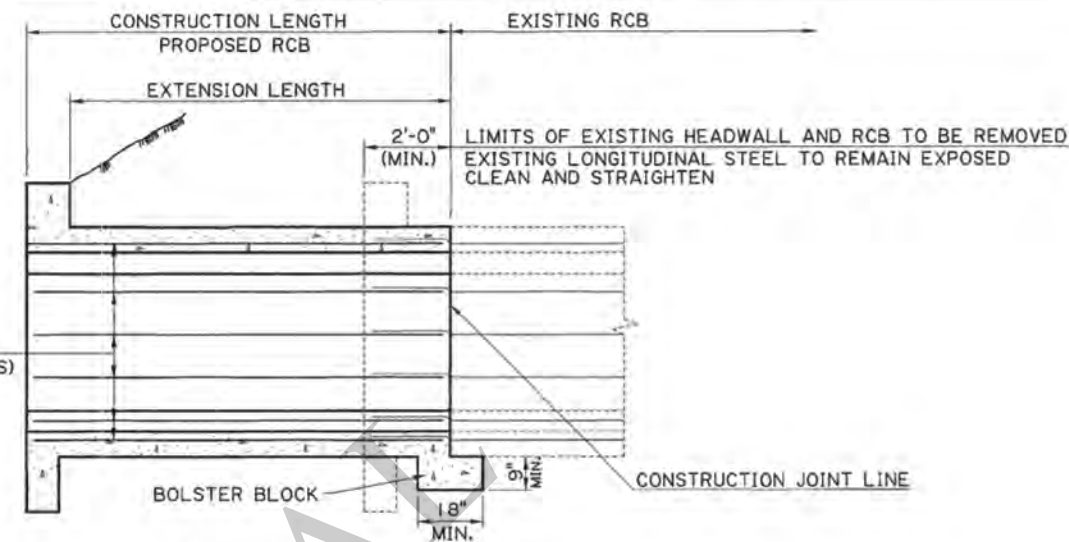
SHEET NUMBER	1 OF 1
DATE	JAN. 1958
PROJECT	REMOVED MANHOLE STEPS, NEW SHEET
DESIGNED	Q.A. HESTER
CHECKED	W.C. MARCOM
DATE	11-17-08
BY	W.C. Marcom
REVISION DESCRIPTION	REMOVED MANHOLE STEPS, NEW SHEET
DATE	11-17-08
APPROVED BY	W.C. Marcom
CHIEF ENGINEER	W.C. Marcom
CONCRETE OPEN TOP CATCH BASIN	MAX. PIPES: 60" X 60"
MAX. DEPTH: 24'	
PLAN	
HYDRAULICS SECTION	



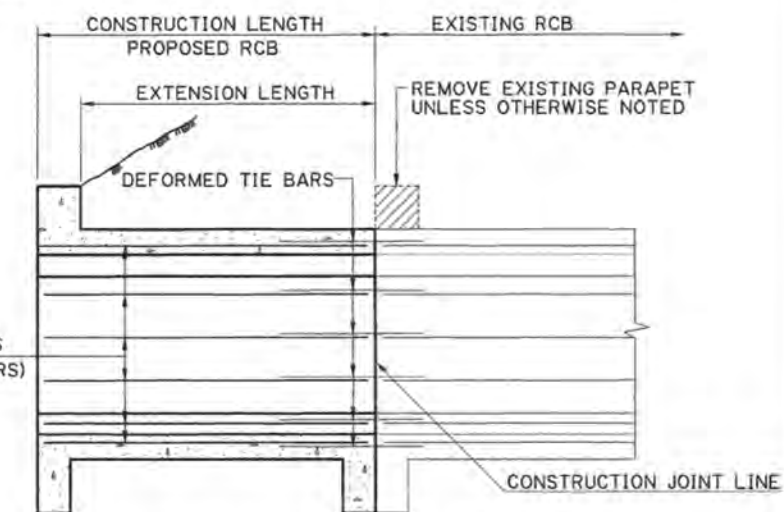
**PLAN
EXISTING HEADWALL REMOVED**
90° CROSSING



**PLAN
EXISTING HEADWALL REMOVED**
SKEWED CROSSING



**SECTION THRU BARREL
EXISTING HEADWALL REMOVED**
90° AND SKEWED CROSSING



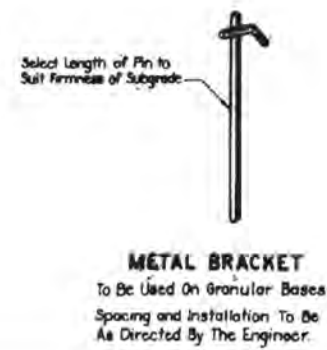
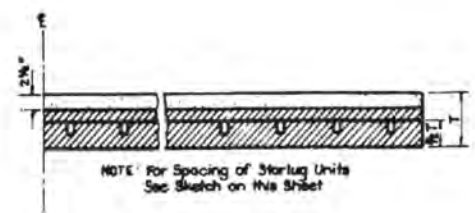
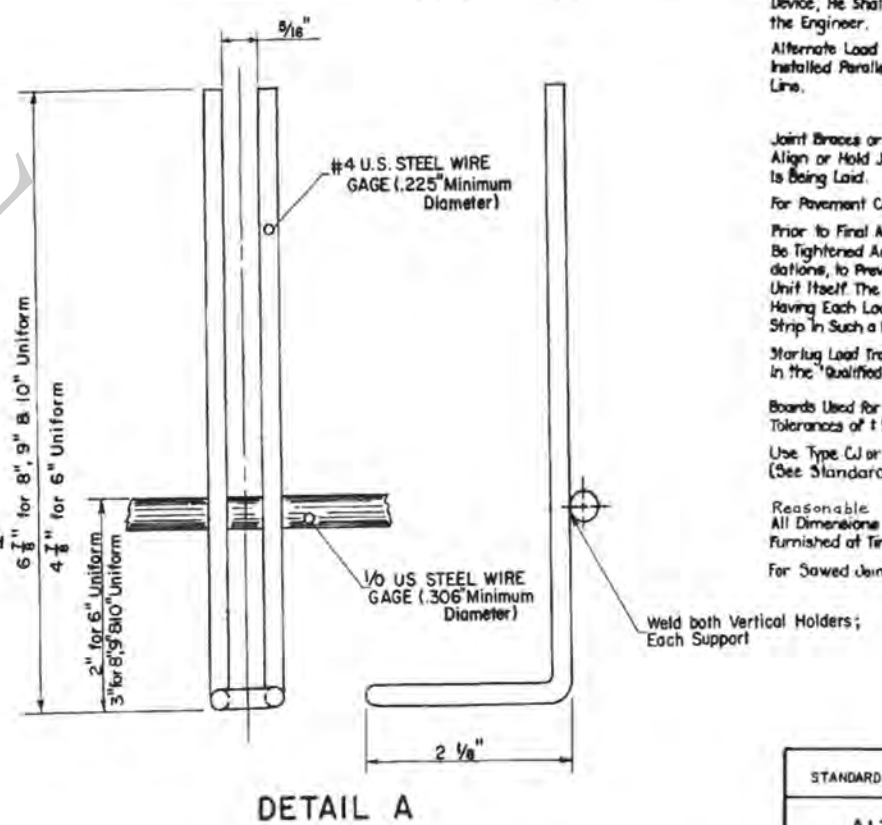
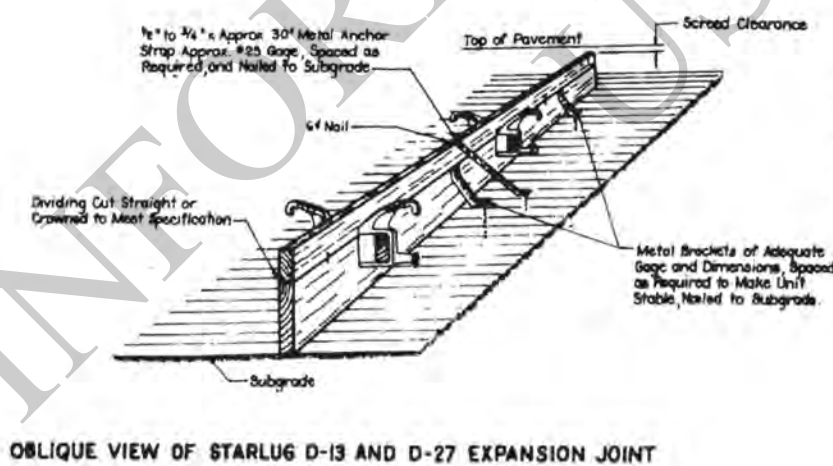
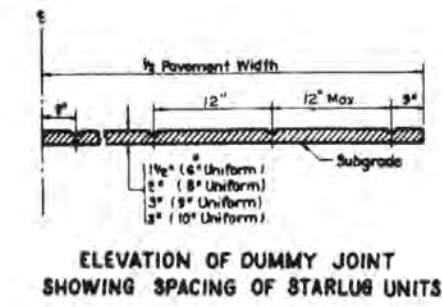
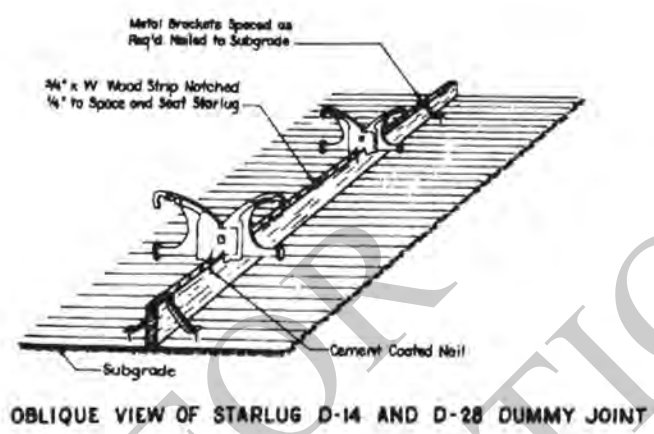
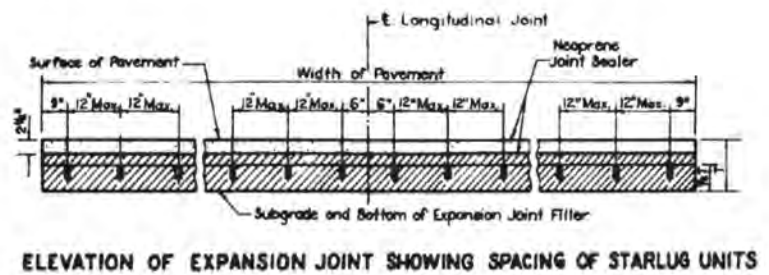
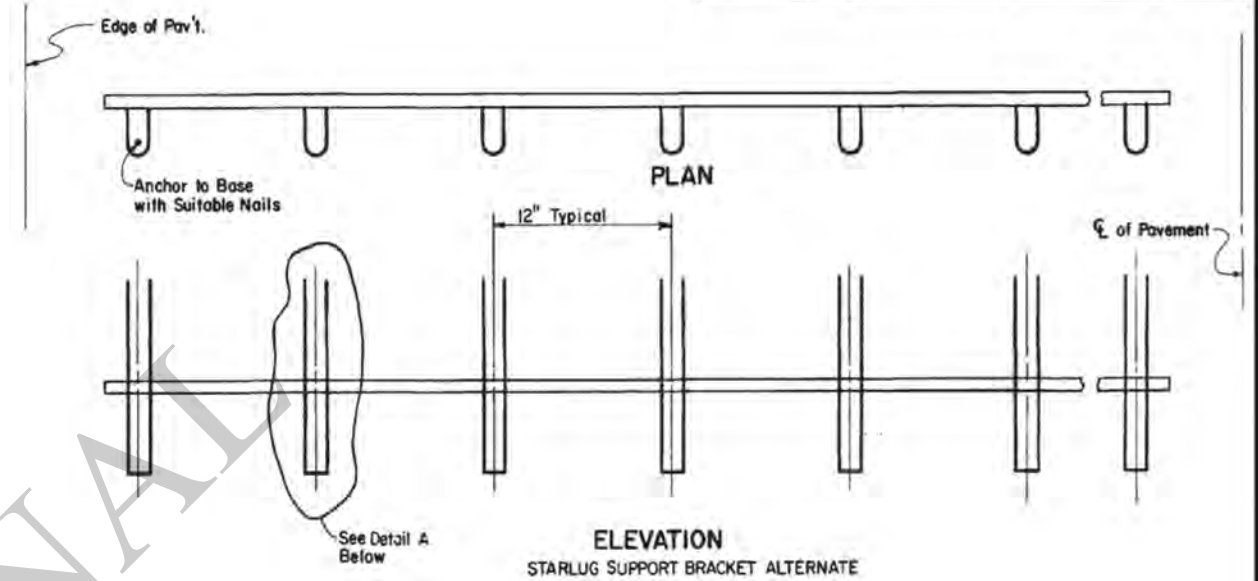
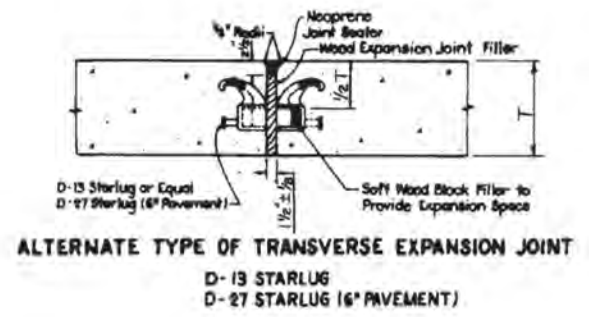
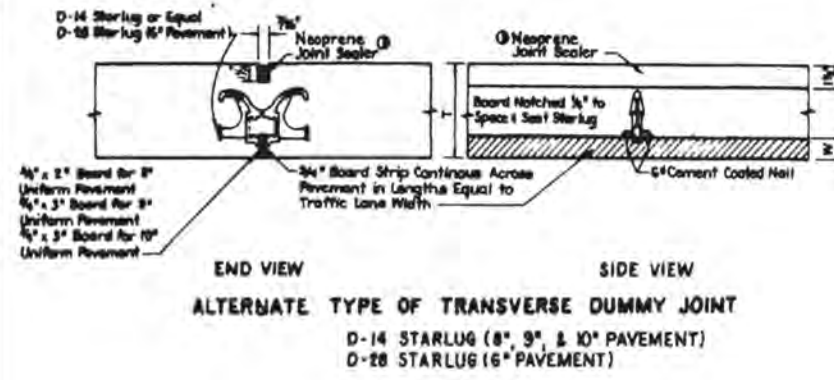
**SECTION THRU BARREL
EXISTING HEADWALL REMAINS**
90° AND SKEWED CROSSING

GENERAL NOTES:

- 1) ALL CONCRETE TO BE CLASS "A".
- 2) REINFORCING STEEL TO BE GRADE 60.
- 3) PROJECT SPECIFICATIONS FOR REINFORCED CONCRETE BOX CULVERT SHALL APPLY.
- 4) ALL EXTENSIONS WILL BE CONSTRUCTED ACCORDING TO THE STANDARD PLANS OR SPECIAL DETAILS REFERRED TO ON THE SUMMARY OF DRAINAGE STRUCTURES SHEET.
- 5) WHERE HEADWALL AND EXISTING RCB TO BE REMOVED, PROPOSED LONGITUDINAL STEEL SHALL OVERLAP EXISTING LONGITUDINAL STEEL BY 2'-0" SPLICE. ALL EXISTING LONGITUDINAL STEEL IN SLABS AND WALLS TO BE STRAIGHTENED, CLEANED AND USED AS SPLICE BARS.
- 6) WHERE EXISTING HEADWALL REMAINS, DEFORMED TIE BARS ARE REQUIRED. DEFORMED TIE BARS SHALL BE #5, 3'-0" IN LENGTH (UNLESS EXTENSION LENGTH REQUIRES SHORTER BARS). HOLES WILL BE DRILLED IN THE EXISTING STRUCTURE TO ALIGN WITH CORRESPONDING LONGITUDINAL BARS IN THE NEW STRUCTURE. THE DEFORMED TIE BARS SHALL BE PLACED IN THE HOLES AND THE HOLES SHALL BE FILLED WITH AN APPROVED MATERIAL FROM QPL52, PRIOR TO POURING CONCRETE FOR THE EXTENSION. THE HOLE DIAMETER SHALL BE IN ACCORDANCE WITH THE EPOXY MANUFACTURER'S RECOMMENDATION.
- 7) WHERE EXISTING HEADWALL REMAINS, ALL SMOOTH END SURFACES OF EXISTING STRUCTURE SHALL BE ROUGHENED BY CHIPPING PRIOR TO POURING EXTENSION.
- 8) GROUND PREPARATION SHALL BE IN ACCORDANCE TO STANDARD PLAN BM-01.

SHEET NUMBER	1
DATE	4-8-09
DESIGNED BY	KJB
CHECKED BY	JDK
DATE	4-8-09
BY	W. J. Temple
REVISION DESCRIPTION	DATE: 4-8-09
APPROVED BY	CHIEF ENGINEER: W. J. Temple
RCB EXTENSIONS	STANDARD METHOD OF EXTENDING REINFORCED CONCRETE BOX CULVERTS 90° AND SKEWED CROSSINGS
HYDRAULICS SECTION	STANDARD PLAN

STATE PROJECT	NUMBER	SHEET NO.



GENERAL NOTES

If the Contractor Desires to Use Any Other Alternate Device, He Shall, Prior to Its Use, Secure Approval by the Engineer.

Alternate Load Transfer Devices or Dowels Shall be Installed Parallel to the Pavement Surface and Center Line.

Joint Braces or Other Suitable Devices May be Used to Align or Hold Joint Assembly in Place While Pavement is Being Laid.

For Pavement Closures See Typical Paving Section.

Prior to Final Assembly, Each Load Transfer Device Shall Be Tightened According to Manufacturer's Recommendations, to Prevent Excessive Movement Within the Unit Itself. The Contractor Shall Also Be Responsible for Having Each Load Transfer Device Fastened to the Wood Strip in Such a Manner as to Prevent Any Movement.

Starlug Load Transmission Assemblies Shall Be As Indicated in the "Qualified Products List".

Boards Used for Installation of Starlugs Are Subject to Tolerances of $\pm 1/8"$.

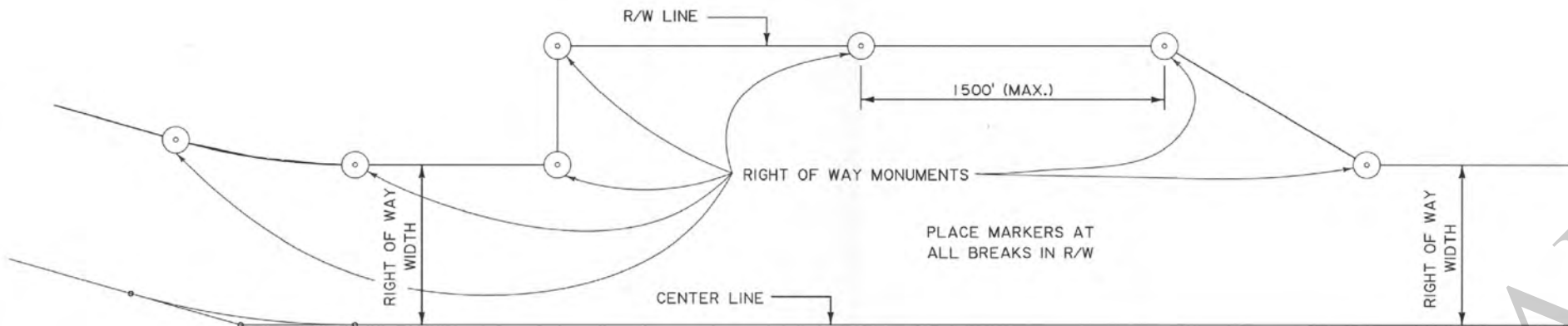
Use Type C or EJ Joints For End of Days Run. (See Standard Plan R-CP-108)

Reasonable Tolerances To All Dimensions Will Be Determined By The Engineer and Furnished at Time of Installation.

For Sawed Joint Details See Standard Plan R-CP-108.

DATE	DESCRIPTION	BY
3-19-84	Support Bracket Minimum	H.J.B.
10-27-81	Added Wire Bracket	W.T.J.
10-22-83	Rev. Transverse Expansion Joint	W.T.J.
8-6-75	Rev. General Note and Added Joint Sealer Type	H.D.S.
5-9-75	Added General Note	H.D.S.
5-15-73	Revised Starlug Spacing	J.P.S.
3-8-73	General Notes	J.P.S.
10-10-72	Revised and Rethroced	J.P.S.

STANDARD PLAN NO.	R-CP-100REV.	SHEET	1 OF 1
ALTERNATE LOAD TRANSMISSION ASSEMBLY FOR EXPANSION AND DUMMY JOINTS			
STATE OF LOUISIANA DEPARTMENT OF TRANSPORTATION & DEVELOPMENT			
DESIGNED	DETAILED	TRACEE N.M. Brummett	
CHECKED	CHECKED	CHECKED A1 Shows	
APPROVED	Demetrius D. White		DATE 3/19/84
CHIEF ENGINEER			



STANDARD RIGHT OF WAY MONUMENT PLAN
MONUMENTS TO BE PLACED AT RIGHT OF WAY INTERSECTIONS

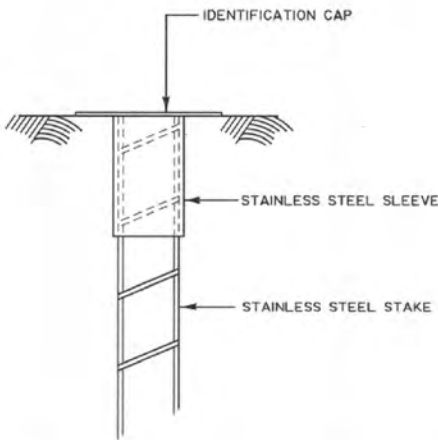
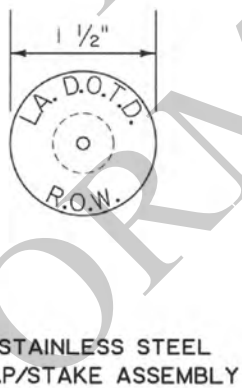
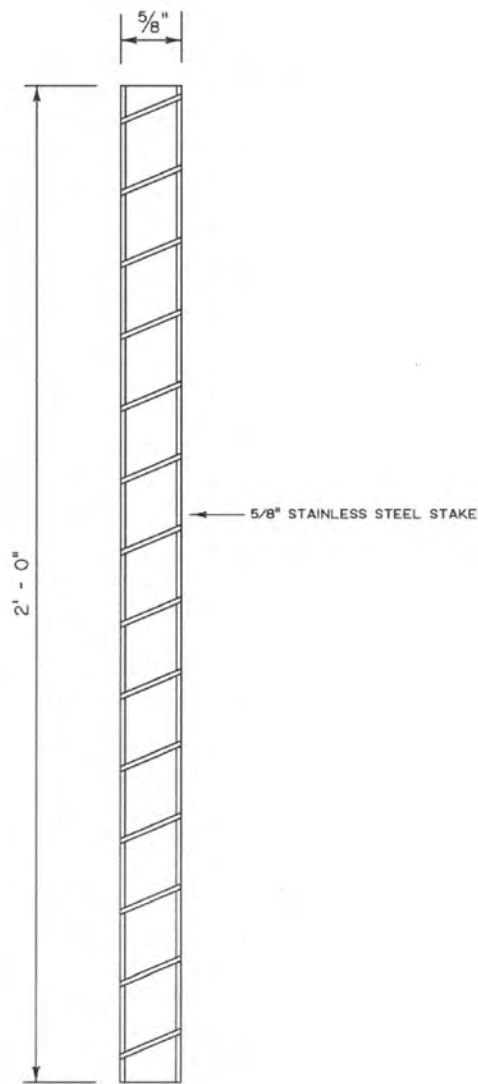
NOTES:

MONUMENTS ARE TO BE PLACED AT EVERY POINT WHERE BREAKS IN THE RIGHT OF WAY OCCUR: AT P.C.'S AND P.T.'S OF CURVES AND AT TOPS OF HILLS AND AT SUCH OTHER INTERMEDIATE POINTS AS ARE NECESSARY TO PROPERLY INDICATE THE RIGHT OF WAY. MONUMENTS SHOULD NOT BE MORE THAN ONE THOUSAND FEET (1000') APART ON CURVES, NOR MORE THAN FIFTEEN HUNDRED FEET (1500') APART ON TANGENTS.

MONUMENTS ARE INDICATED ON PLANS BY THE FOLLOWING SYMBOL.

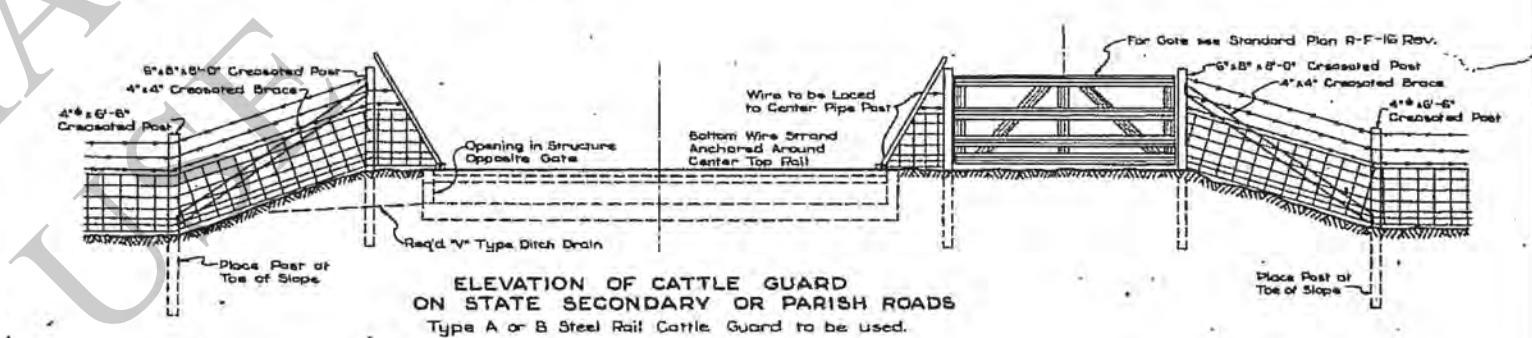
MONUMENTS SHALL BE A 1-1/2" STAINLESS STEEL CAP FASTENED TO A 5/8" (#5) STAINLESS STEEL REBAR BY A STAINLESS STEEL SLEEVE AS INDICATED BELOW.

RIGHT OF WAY MONUMENTS SHALL BE SET BY, OR UNDER THE RESPONSIBLE CHARGE OF A LOUISIANA REGISTERED PROFESSIONAL LAND SURVEYOR IN CONFORMANCE WITH CHAPTER 29, TITLE 46 PART LXI, OF THE RULES OF THE LOUISIANA PROFESSIONAL ENGINEERING AND LAND SURVEYING BOARD.



SET BOTTOM OF IDENTIFICATION CAP FLUSH WITH THE EXISTING GROUND

SHEET NUMBER		PARISH		CONTROL SECTION		STATE PROJECT	
DESIGN		CHECK		DETAIL		REVIEW	
DATE		DATE		DATE		DATE	
APPROVED BY CHIEF ENGINEER		DATE		DATE		DATE	
RIGHT OF WAY MONUMENTS		RM-01		STANDARD PLAN		LOCATION AND SURVEY	
DOTD		LOUISIANA DEPARTMENT OF TRANSPORTATION & DEVELOPMENT		LOCATION AND SURVEY		LOCATION AND SURVEY	



Note: Proj. Engineer to check size of Rails and Dimensions before permitting Materials to be ordered.
Quantities shown above are for Cattle Guards with Bottom Slab.
Cattle Guard to be paid for as a Unit, Complete in Place.
Quantities shown for Fab. Carbon Steel do not include Riv. Fastenings, Bolts, Welds, etc.

* Based on 45" Deck Rails and 64" Stringer Rails.

APPROVED: Dennis D. Galt DATE: 3-24-77

APPROVED: Dempsey D. White DATE: 3-24-77
CHIEF ENGINEER

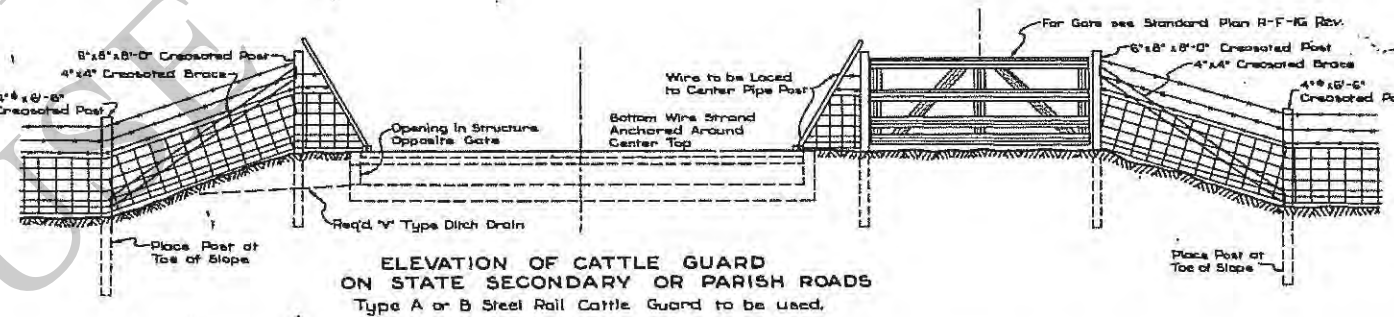
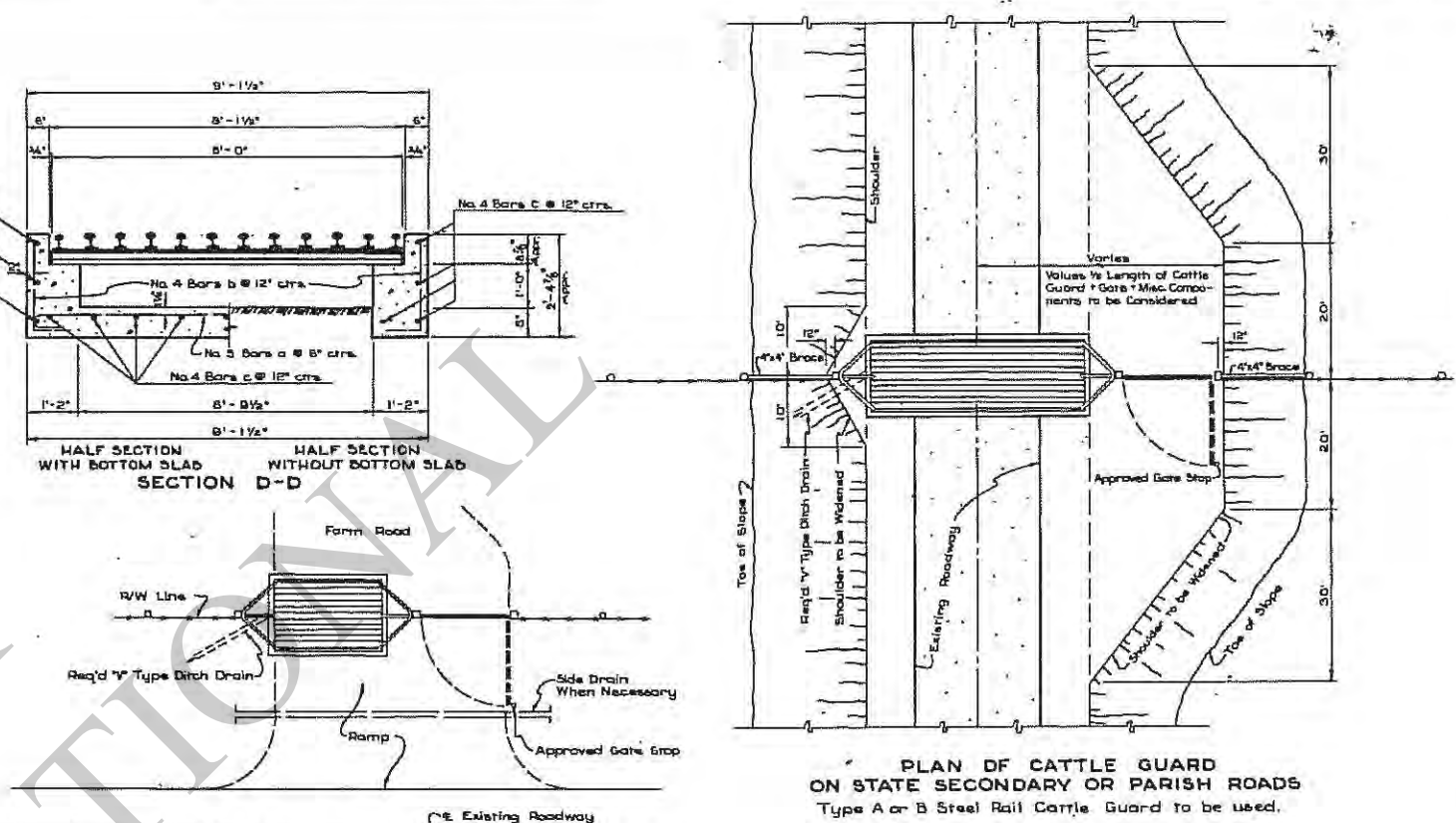
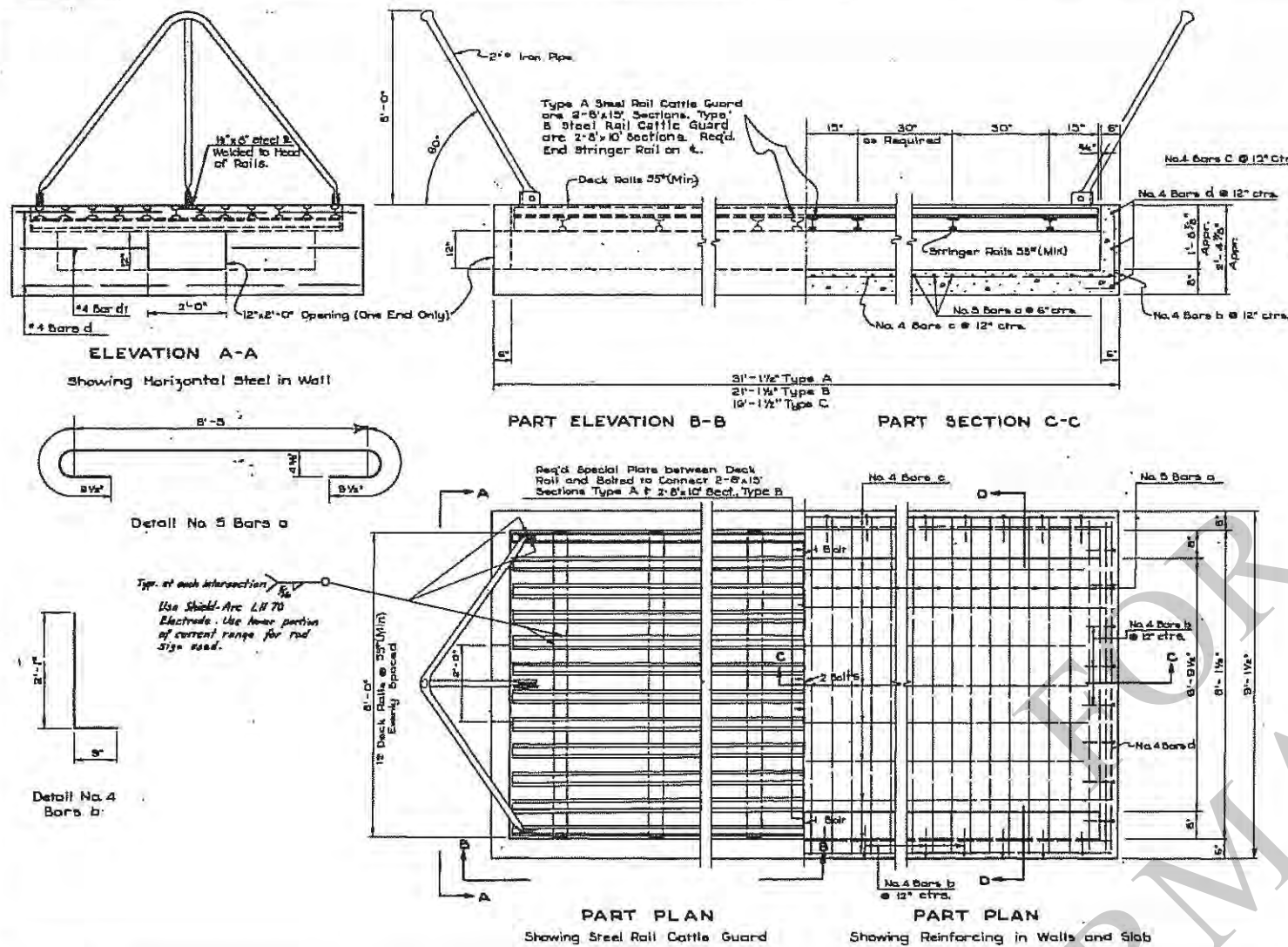
STANDARD PLAN
PORTABLE STEEL RAIL
CATTLE GUARD

8' SPAN; 15', 20' AND 30' LENGTHS
7'-6" SPAN; 10' LENGTH
ED. Nov. 1934 42" TO 45" DECK RAILS

STATE OF LOUISIANA
DEPARTMENT OF HIGHWAYS

DESIGNED	DETAILED E. L. B.	TRACED Rolo
CHECKED	CHECKED	CHECKED
IN CHARGE OF		

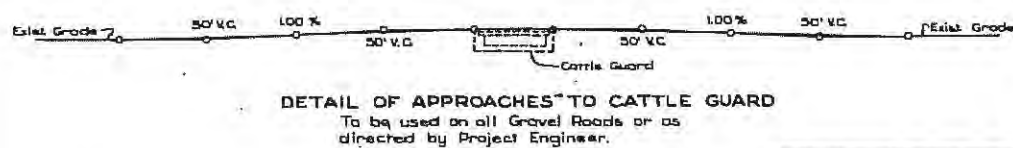
D-M-37



STEEL RAIL CATTLE GUARD	CONCRETE STRUCTURE	BILL OF MATERIAL										DEFORMED REINFORC. STEEL	FABRICATED CARBON STEEL	CLASS A CONCRETE
		NO. 5 BARS a	NO. 4 BARS b	NO. 4 BARS c	NO. 4 BARS d	NO. 4 BARS e	NO. 4 BARS f	NO. 4 BARS g	NO. 4 BARS h	NO. 4 BARS i	NO. 4 BARS j	POUNDS	POUNDS	CU. YDS.
A	8' x 90'	62	10 - 0	74	2 - 10	15	30 - 10	5	8 - 10	2	3 - 3	1150	* 10069	10.99
B	8' x 20'	42	10 - 0	54	2 - 10	15	20 - 10	5	8 - 10	2	3 - 3	785	* 8827	7.60
C	8' x 15'	32	10 - 0	44	2 - 10	15	15 - 10	5	8 - 10	2	3 - 3	610	* 4864	5.91
D	7'-6" x 10'	22	9 - 8 1/2	34	2 - 5	15	10 - 10	5	8 - 4	2	3 - 0	408	1875	3.16

Note: Proj. Engineer to check size of Rails and Dimensions before permitting Materials to be ordered.
Quantities shown above are for Cattle Guards with Bottom Slab.
Cattle Guard to be paid for as a Unit, Complete in Place.
Quantities shown for Fab. Carbon Steel do not include Rs, Fastenings, Bolts, Welds, etc.

APPROVED: *[Signature]* DATE 3-24-77
CHIEF ENGINEER



STANDARD PLAN / PORTABLE STEEL RAIL / CATTLE GUARD		
8' SPAN; 15', 20' AND 30' LENGTHS 7'-6" SPAN; 10' LENGTH 12" MIN. DECK RAILS		
STATE OF LOUISIANA DEPARTMENT OF HIGHWAYS		
DESIGNED	DETAILED B.L.B.	TRACKED RAILS
CHECKED	CHECKED R.A.H. & W.E.H.	CHECKED R.A.H.
IN CHARGE OF		

GENERAL NOTES - ROADSIDE TRAFFIC SIGNS

CONSTRUCTION SPECIFICATIONS: CONSTRUCTION SHALL BE IN ACCORDANCE WITH THE LOUISIANA DEPARTMENT OF TRANSPORTATION AND DEVELOPMENT, STANDARD SPECIFICATIONS FOR ROADS AND BRIDGES, LATEST EDITION EXCEPT AS SUPPLEMENTED OR AMENDED BY THE PLANS, SUPPLEMENTAL SPECIFICATIONS AND/OR SPECIAL PROVISIONS.

DESIGN SPECIFICATIONS: AASHTO STANDARD SPECIFICATIONS FOR STRUCTURAL SUPPORTS FOR HIGHWAY SIGNS, LUMINARIES AND TRAFFIC SIGNALS, 1994 AND INTERM SPECIFICATIONS.

STEEL: STEEL SHALL CONFORM TO A.S.T.M. A-709, GRADE 36. STEEL TUBING SHALL CONFORM TO THE APPLICABLE REQUIREMENTS OF A.S.T.M. DESIGNATION A-36 OR HOT-FORMED TUBING (A-501) OR PIPE (A-53) TYPE "E" OR "S", GRADE "B" OR COLD-FORMED TUBING (A-500) GRADE "B" OR "C", UNLESS OTHERWISE NOTED.

ALUMINUM: ALL ALUMINUM EXCEPT SIGN PANELS SHALL CONFORM TO ASTM B-221, B-308, OR B-429 ALLOY 6061-T6 UNLESS OTHERWISE NOTED. SIGN PANELS SHALL BE .080" THICK ALUMINUM CONFORMING TO ASTM B-209 ALLOY 5052-H38 OR 6061-T6.

CONCRETE AND REINFORCING STEEL: CONCRETE SHALL BE CLASS "M", UNLESS OTHERWISE NOTED. DIMENSIONS RELATING TO REINFORCING STEEL FABRICATION ARE OUT TO OUT OF BAR UNLESS OTHERWISE NOTED. DIMENSIONS RELATING TO REINFORCING STEEL SPACING ARE CENTER TO CENTER OF BAR OR FACE OF CONCRETE TO CENTERLINE OF BAR. REINFORCING STEEL SHALL HAVE A MINIMUM COVERING OF 2" EXCEPT WHEN CONCRETE IS CAST AGAINST THE EARTH THEN THE COVERING WILL BE 3". ALL REINFORCING STEEL SHALL BE GRADE 60. THE FIRST DIGIT OF REINFORCING BAR NUMBER INDICATES THE BAR SIZE. THE TOP EDGES OF THE FOOTING SHALL BE CHAMFERED $\frac{3}{4}$ ".

CONCRETE FINISH: ALL PORTIONS OF THE FOOTINGS FOR CANTILEVERS AND TRUSSES ABOVE GROUNDLINE SHALL HAVE A FINISH IN ACCORDANCE WITH LOUISIANA SPECIFICATION. 805.08.3.

WELDING: ALL WELDING SHALL CONFORM TO THE L.A. STANDARD SPECIFICATIONS, SECTION 809 AND SUPPLEMENTAL SPECIFICATIONS.

GALVANIZING: ALL STRUCTURAL STEEL AND MISCELLANEOUS STEEL SHALL BE GALVANIZED IN ACCORDANCE WITH A.S.T.M. DESIGNATION A-123. DAMAGE TO GALVANIZED SURFACES THAT ARE NOT TO BE ENCASED IN CONCRETE SHALL BE REPAIRED IN ACCORDANCE WITH L.A. STANDARD SPECIFICATIONS, SECTION 811.08. ALL BOLTS, NUTS AND WASHERS SHALL BE GALVANIZED IN ACCORDANCE WITH A.S.T.M. DESIGNATION A-153. ALL FIELD HOLES IN GALVANIZED MATERIAL SHALL BE TREATED WITH A COLO GALVANIZING COMPOUND FROM THE A.M.I.

BOLTS: UNLESS NOTED, ALL THREADED CONNECTIONS SHALL INCORPORATE A LOCKING DEVICE AND HAVE A MINIMUM OF 3 THREADS BEYOND THE NUTS. ALL BOLTS SHALL BE HIGH STRENGTH BOLTS, A.S.T.M. A-325, UNLESS OTHERWISE NOTED. ANCHOR BOLTS SHALL CONFORM TO AASHTO M314, GRADE 55 (OR APPROVED EQUAL) AND BE HOT DIP GALVANIZED TO A.S.T.M. A-153. STAINLESS STEEL FOR BOLTS SHALL CONFORM TO A.S.T.M. DESIGNATION A-320 B8, CLASS 2 TYPE 304, OR A-193 B8, CLASS 2 TYPE 304, UNLESS OTHERWISE NOTED. STAINLESS STEEL NUTS SHALL CONFORM TO A.S.T.M. DESIGNATION A-194, GRADE 8, TYPE 304. ALUMINUM BOLTS SHALL CONFORM TO A.S.T.M. F-468 ALLOY 2024-T4 AND NUTS ARE A.S.T.M. F-467 ALLOY 6061-T6 OR 6262-T9. WHERE BOLTS ARE USED ON BEVELED SURFACES, BEVELED WASHERS SHALL BE PROVIDED TO GIVE FULL BEARING TO THE HEAD AND/OR THE NUT.

RIVETS: ALL RIVETS SHALL BE $\frac{1}{4}$ " DIAMETER BLIND RIVETS WITH POSITIVE MANDREL RETENTION. THE RIVET BODY AND MANDREL SHALL BE ALUMINUM WITH A $\frac{1}{2}$ " MAXIMUM DIAMETER DOME HEAD. THE RIVETS SHALL HAVE A MINIMUM ULTIMATE TENSILE STRENGTH = 875 LBS., AND CONFORM TO ASTM B-316 5056-H32.

BREAK-AWAY BASE: BASES FOR SIGNS LOCATED ADJACENT TO MORE THAN ONE ROADWAY (RAMP TERMINALS, INTERSECTIONS, ETC.) SHALL BE ORIENTED IN THE DIRECTION OF THE HIGHEST SPEED TRAFFIC. ALL MULTI-POST SIGNS WITH A DISTANCE BETWEEN POSTS OF 7'-0" CENTERS OR LESS SHALL HAVE BEVELED BASE CONNECTION. BASE CONNECTIONS SHALL BE WRAPPED PRIOR TO POURING THE FOOTING, WITH MATERIAL SUFFICIENT TO PREVENT CONCRETE SPLATTER ON THE BREAK-AWAY BASE ASSEMBLY.

ANCHOR BOLTS: ANCHOR BOLT NUTS TO BE TIGHTENED A MINIMUM ROTATION OF 240° ($\frac{2}{3}$ TURNS) FROM THE SNUG TIGHT CONDITION.

SIGN SHEETING: UNLESS OTHERWISE NOTED, ALL SIGN MATERIAL SHALL BE IN ACCORDANCE WITH SECTION 1015 IN THE STANDARD SPECIFICATIONS. IN ORDER TO OBTAIN AN ACCEPTABLE COLOR MATCH BETWEEN MULTIPLE PANELS ON A GUIDE SIGN, ALL OF THE BACKGROUND SHEETING FOR ANY GUIDE SIGN SHALL BE THE MINIMUM WIDTH OF THE LARGEST PANEL AND SHALL COME FROM THE SAME LOT OR RUN NUMBER FROM THE SHEETING MANUFACTURER UNLESS OTHERWISE APPROVED IN WRITING. RETRO-REFLECTIVE SHEETING SHALL BE APPLIED TO ALL PANELS IN SUCH A MANNER THAT THERE ARE NO HORIZONTAL SPLICES.

OVERLAY PANELS FULL SIGN OVERLAY PANELS SHALL BE IN ACCORDANCE WITH SECTION 729.05.3. PARTIAL SIGN OVERLAYS AND ALL SHIELDS SHALL HAVE SHIMS AT ALL RIVETS. SHIMS SHALL BE AT LEAST .080" THICK AND SIZED SO THEY WILL NOT EXTEND BEYOND EDGE OF OVERLAY. RIVETS SHALL BE AS SPECIFIED ON THIS STANDARD DETAIL SHEET.

SIGN LOCATIONS: FOR GROUND MOUNTED SIGN INSTALLATIONS, THE ENGINEER MAY ADJUST THE TYPE D AND E SIGN LOCATIONS INDICATED ON THE PLANS. THIS WILL BE ALLOWED TO AVOID PLACEMENT IN DEEP DITCHES, STEEP BACKSLOPES, TREE LINES, AND ANY OTHER UNACCOUNTED FOR FIELD CONDITIONS AND TO PROVIDE BETTER MESSAGE PRESENTATION. ANY ADJUSTMENTS MUST BE WITH THE CONCURRENCE OF THE GEOMETRIC DESIGN ENGINEER.

SIGN TYPES: TYPE A = SMALL SIGN WITH ONE POST; TYPE B = CLUSTER ASSEMBLY OF TYPE A SIGNS; TYPE D = LARGE RECTANGULAR SIGN ADJACENT TO TRAFFIC MOUNTED WITH MULTIPLE POSTS; TYPE E = SECONDARY SIGN (SUCH AS AN EXIT NUMBER PANEL) ATTACHED TO A LARGE RECTANGULAR PRIMARY SIGN; DELINEATOR, MILEPOST AND OBJECT MARKER SIGNS ARE NOT COVERED UNDER TRAFFIC SIGNS. SEE STANDARD PLAN HS-03.

MISCELLANEOUS: THE CONTRACTOR SHALL MARK THE DATE OF FABRICATION, SHEETING MANUFACTURER CODE, AND SIZE OF SIGN ON THE BACK OF EACH SIGN. FOR EXTRUDED PANEL SIGNS THE LETTER HEIGHT SHALL BE 2". FOR ALL OTHER FLAT SHEETING SIGNS, THE LETTER HEIGHT SHALL BE $\frac{3}{4}$ ". THE SIGN ID NUMBERS SHALL FOLLOW THE ABOVE REQUIREMENTS BUT SHALL HAVE A BLUE BACKGROUND WITH WHITE NUMBERS. ALL MARKINGS SHALL HAVE A CLEAR UV PROTECTIVE FILM INSTALLED OVER THEM. SEE DETAIL "A" SHEET 5 OF 17.

POST HINGE SPLICE ON MULTI-POST SIGNS WITH ALL POSTS CONNECTED BY A SECONDARY SIGN SHALL BE LOCATED BELOW THE SECONDARY SIGN. STUB POST SHALL BE ASSEMBLED TO SIGN POST WITH REQUIRED BOLTS AND ONE FLAT WASHER ON EACH BOLT BETWEEN PLATES PRIOR TO SHIPMENT. POST SPLICE SLIP PLATE SHALL BE ASSEMBLED TO MINIMUM BOLT TENSION IN SHOP PRIOR TO SHIPMENT. SIGN POST SHALL BE SHIPPED TO JOB SITE ASSEMBLED WITH ALL HARDWARE REQUIRED IN PLACE AND SECURED. EXPOSED ENDS OF ALL PIPE SHALL BE CAPPED. USE OF SECTIONS PROVIDING EQUAL OR GREATER STRENGTH FOR ANY MEMBER DESIGNATED ON THE PLANS SHALL BE SUBMITTED TO THE BRIDGE ENGINEER FOR APPROVAL.

ALL DIMENSIONS REQUIRED FOR SATISFACTORY INSTALLATION SHALL BE VERIFIED IN THE FIELD BY THE CONTRACTOR PRIOR TO THE FABRICATION. ADJUSTMENTS SHALL BE MADE AS DIRECTED BY THE ENGINEER.

ALL ALUMINUM SURFACES PLACED IN CONTACT WITH, OR FASTENED TO, UNGALVANIZED STEEL MEMBERS SHALL BE THOROUGHLY COATED WITH AN APPROVED ALUMINUM IMPREGNATED CAULKING COMPOUND. PAINT ALUMINUM SECTIONS IN CONTACT WITH CONCRETE WITH A HEAVY COAT OF AN ALKALI RESISTANT BITUMINOUS PAINT OR A COAT OF ZINC CHROMATE PAINT AND ALLOW TO DRY BEFORE PLACING. ALUMINUM ALLOYS SHALL NOT BE PLACED IN CONTACT WITH COPPER, COPPER BASED ALLOYS, LEAD, OR NICKEL.

SHOP DRAWINGS: NOT REQUIRED FOR SIGN BACKING AND SMALL GROUND MOUNTED SIGN SUPPORTS, UNLESS FABRICATOR INTENDS TO DEVIATE FROM THE DETAILS HEREIN. SHOP DRAWING ARE REQUIRED FOR ALL STRUCTURE MOUNTED SIGNS.



WIND LOAD MAP

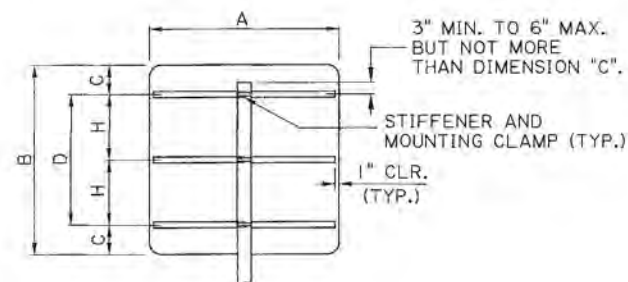
WIND LOAD MAP LEGEND			
SYMBOL	ROADSIDE MOUNTED		
	ZONE	WIND VELOCITY (MPH) ⓧ	WIND LOAD (PSF) Δ
	1	70	20
	2	80	27

ⓧ 25 YEAR MEAN RECURRENCE INTERVAL

Δ INCLUDES $C_e = 1.2$

SHEET	BRIDGE STANDARD INDEX NO.	DESCRIPTION
1 OF 17	BD.2.7.2.0.1	WIND LOAD MAP & GENERAL NOTES
2 OF 17	BD.2.7.2.0.2	PANEL DETAILS (TYPE A & B SIGNS)
3 OF 17	BD.2.7.2.0.3	MOUNTING DETAILS (TYPE A & B SIGNS)
4 OF 17	BD.2.7.2.0.4	SPACING OF POSTS FOR GROUND MOUNTED SIGNS
5 OF 17	BD.2.7.2.0.5	EXTRUDED ALUMINUM SIGNS (TYPE D & E SIGNS)
6 OF 17	BD.2.7.2.0.6	EXTRUDED ALUMINUM PANELS (TYPE D & E SIGNS)
7 OF 17	BD.2.7.2.0.7	ROADSIDE MOUNTED SIGNS (TYPE A, B, & D SIGNS)
8 OF 17	BD.2.7.2.0.8	ROADSIDE MOUNTED SIGN DETAILS (TYPE A & B SIGNS)
9 OF 17	BD.2.7.2.0.9	ROADSIDE MOUNTED SIGN DETAILS (TYPE D SIGNS)
10 OF 17	BD.2.7.2.0.10	SQUARE TUBE SIGN DETAILS
11 OF 17	BD.2.7.2.0.11	Z - BRACKET SIGN SUPPORT (F - SHAPE BARRIER)
12 OF 17	BD.2.7.2.0.12	Z - BRACKET SIGN SUPPORT (F - SHAPE BARRIER)
13 OF 17	BD.2.7.2.0.13	Z - BRACKET SIGN SUPPORT (POST AND RAIL BARRIER)
14 OF 17	BD.2.7.2.0.14	Z - BRACKET SIGN SUPPORT (POST AND RAIL BARRIER)
15 OF 17	BD.2.7.2.0.15	CONTRAFLOW SIGNS (GROUND MOUNTED)
16 OF 17	BD.2.7.2.0.16	CONTRAFLOW SIGNS (F - SHAPE BARRIER)
17 OF 17	BD.2.7.2.0.17	CONTRAFLOW SIGNS (POST AND RAIL BARRIER)

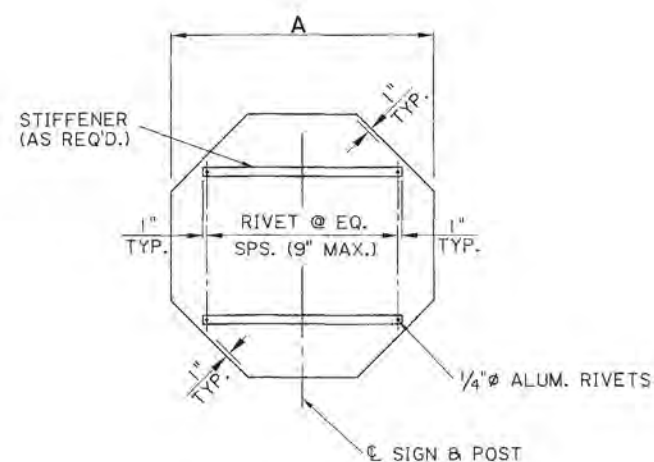
SHEET NUMBER	17
DESIGN	K. BRAUNER
CHECK	C. GUIDRY
DETAIL	K. BRAUNER
REVIEW	C. GUIDRY
SERIES	1 OF 17
DATE	7/1/2022
APPROVED BY CHIEF ENGINEER	
STATE OF LOUISIANA	
WIND LOAD MAP & GENERAL NOTES	ROADSIDE SIGNING STANDARDS
BRIDGE AND STRUCTURAL DESIGN	



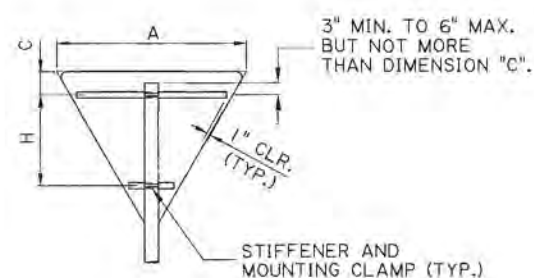
SQUARE, RECTANGLE, CIRCLE,
OCTAGON AND ROUTE MARKERS

SQUARE, RECTANGLE, CIRCLE, OCTAGON AND ROUTE MARKERS					
A (IN.)	B (IN.)	C (IN.)	D (IN.)	H (IN.)	STIFFENER
					NUMBER REQUIRED
VARIABLE 12" TO 48" ↑ ↓	6	3			1
	12	6			1
	15	7.5			1
	18	9			1
	24	6	12		2
	30	7.5	15		2
	36	7.5	21		2
	48	10	28		2
	60	9	42	21	3
	72	11	6 [△]	25	3
	84	10.5	6 [△]	21	4
	48	96	12	6 [△]	24

△ LOCATION OF BORDER ANGLE FROM EDGE



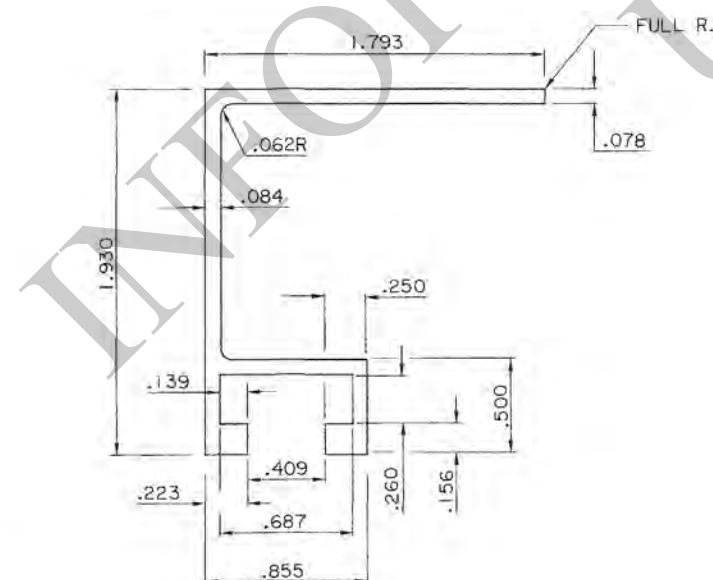
TYPICAL SIGN BACKING DETAIL



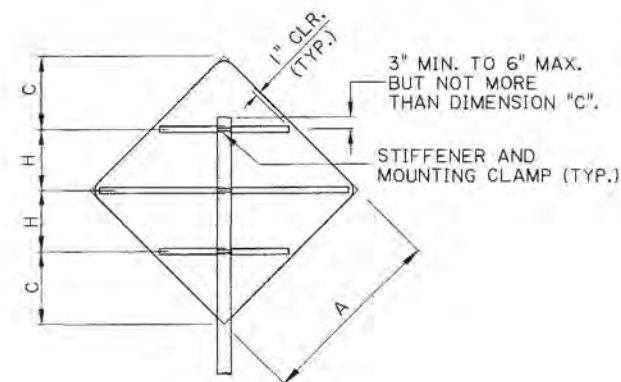
EQUILATERAL TRIANGLE

EQUILATERAL TRIANGLE			
A (IN.)	C (IN.)	H (IN.)	STIFFENER NUMBER REQUIRED
24	8		1
30	6	10	2
36	6	12.5	2
48	6	23	2
60	6	33.5	2

TYPE A SIGNS



EXTRUSION STIFFENER
THIS STIFFENER REQUIRES
THE USE OF RIVETS



DIAMOND

DIAMOND			
A (IN.)	C (IN.)	H (IN.)	STIFFENER
			NUMBER REQUIRED
24	10	6.97	1
30	12	9.21	2
36	14	11.46	2
48	18.5	15.44	3
60	22.5	19.93	3

NOTES:

NO BOLTS SHALL BE PLACED THROUGH FACE OF SIGN.

ALL TRACK HEAD BOLTS SHALL HAVE HEADS DESIGNED TO FIT AND TRANSMIT LOAD TO BOLT SLOTS IN THE STIFFENER.

STIFFENERS SHALL BE ALUMINUM EXTRUSIONS AS DETAILED
ON THIS SHEET UNLESS OTHERWISE NOTED.

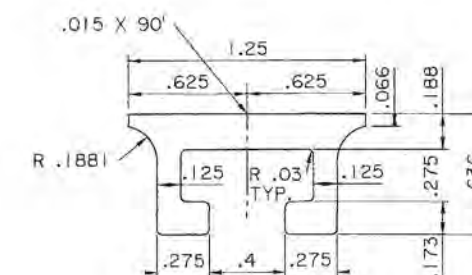
MOUNTING CLAMPS REQUIRED AT EACH HORIZONTAL STIFFENER.

SIGN PANELS AND POSTS SHALL BE THE SIZE REQUIRED ON THE PLANS AND SUMMARY SHEET.

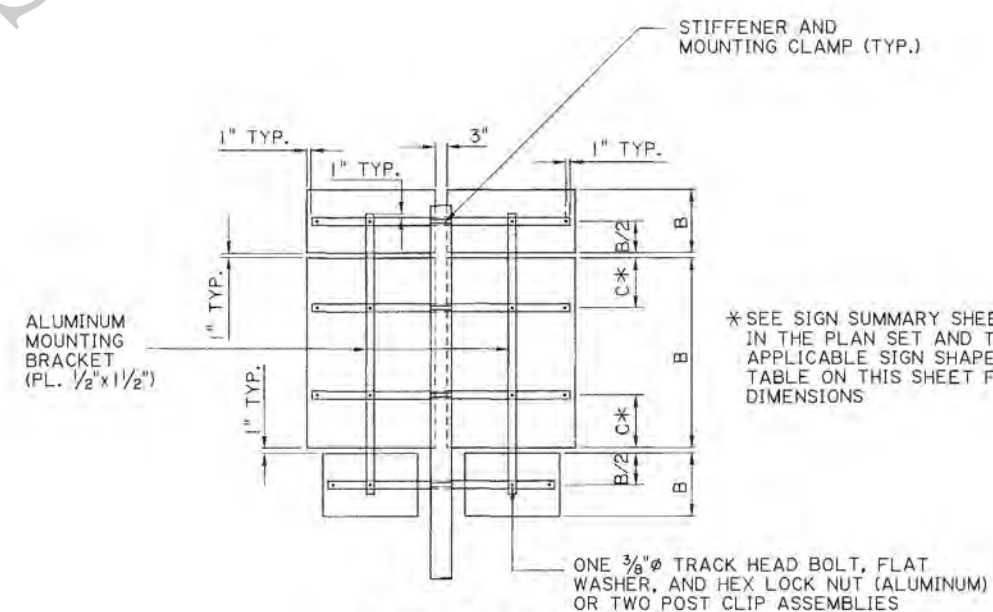
SEE OTHER SHEETS FOR MOUNTING DETAILS.

ALL SIGNS THAT REQUIRE BACKING SHALL BE INSTALLED WITH RIVETS.

THIS SHEET TO BE USED WITH WIND LOAD MAP AND GENERAL
NOTES SHEET.



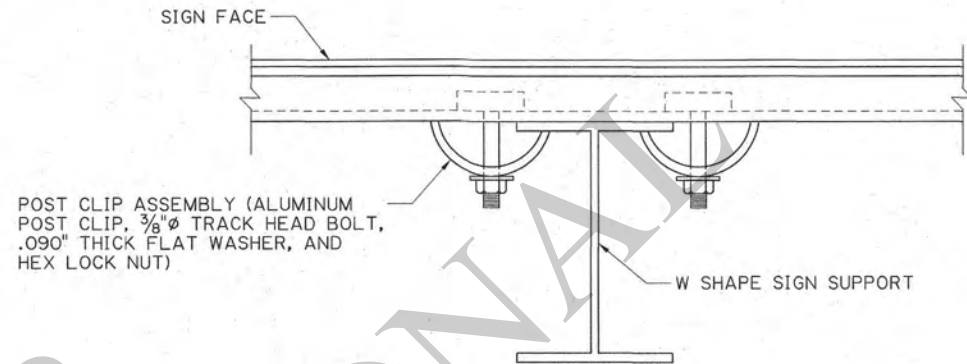
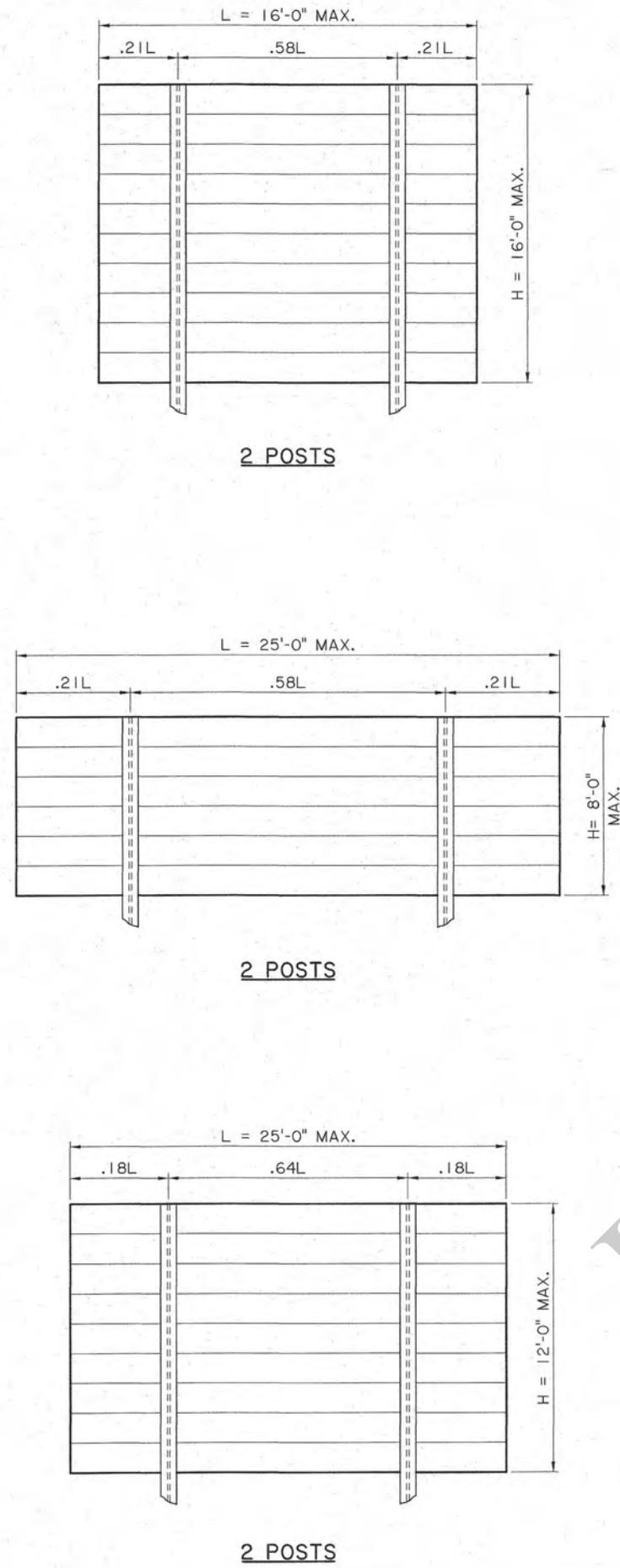
EXTRUDED CHANNEL DETAIL



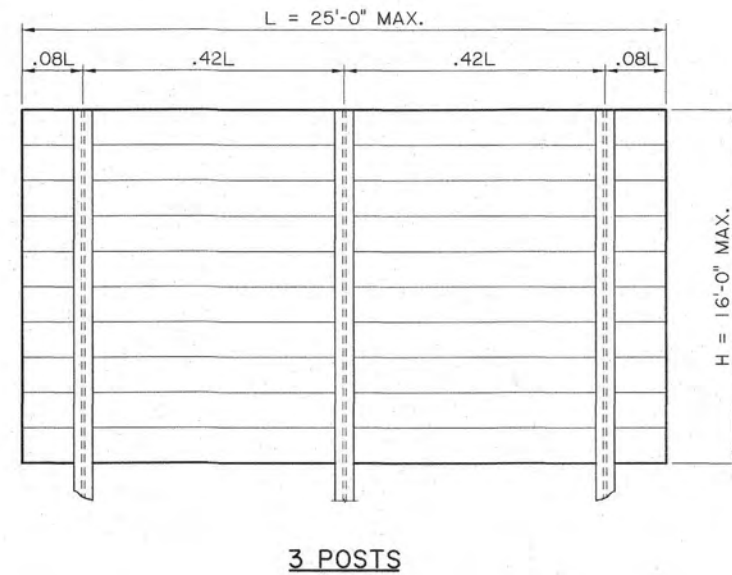
TYPE B SIGN
CLUSTER ASSEMBLY

*SEE SIGN SUMMARY SHEET
IN THE PLAN SET AND THE
APPLICABLE SIGN SHAPE
TABLE ON THIS SHEET FOR
DIMENSIONS

— ONE $\frac{3}{8}$ " ϕ TRACK HEAD BOLT, FLAT WASHER, AND HEX LOCK NUT (ALUMINUM) OR TWO POST CLIP ASSEMBLIES



MOUNTING DETAIL (TYPE II)



SHEET NUMBER		PARISH		CONTROL SECTION		STATE PROJECT	
DESIGN	K. BRAUNER	CHECK	C. GUIDRY	DETAIL	K. BRAUNER	CHECK	C. GUIDRY
REVIEW	C. BOURGEOIS	SERIES # 4 OF 17					

STATE OF LOUISIANA

KURT M. BRAUNER

License No. 20567

PROFESSIONAL ENGINEER

IN

CIVIL ENGINEERING

KMB

6/24/22

APPROVED BY CHIEF ENGINEER:

Christopher J. G. G. G.

7/1/2022

DATE:

STATE OF LOUISIANA

CONFIDENTIAL

SPACING OF POSTS FOR GROUND MOUNTED SIGNS

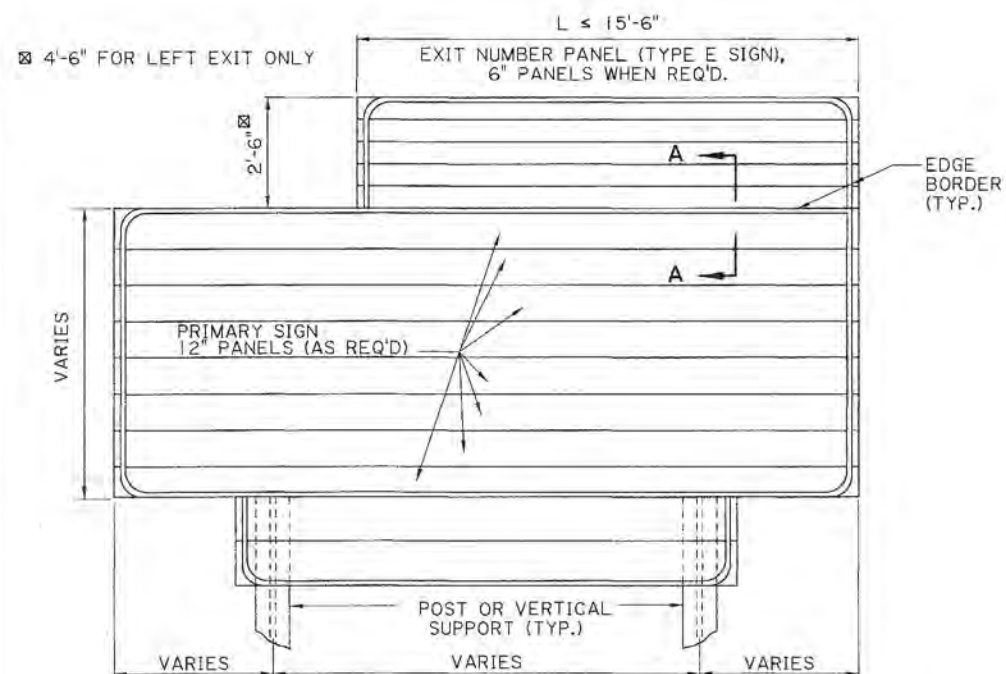
STANDARD PLAN

ROADSIDE SIGNING STANDARDS

DOTD

LOUISIANA DEPARTMENT OF TRANSPORTATION & DEVELOPMENT

BRIDGE AND STRUCTURAL DESIGN



FRONT ELEVATION

POST CLIPS AND $\frac{3}{8}$ " BOLTS (TYP.)
INSTALL TWO (2) POST CLIPS AT EACH
JUNCTION OF EXTRUSION AND VERTICAL
SUPPORT, ONE (1) ON UPPER EXTRUSION
AND ONE (1) ON LOWER EXTRUSION
WHERE EXTRUSIONS JOIN ONE ANOTHER.

POST (FOR GROUND MOUNTED
SIGNS) OR A PAIR OF VERTICAL
SUPPORT ANGLES (FOR
OVERHEAD MOUNTED OR FASCIA
MOUNTED SIGNS) (TYP.)

NOTES:

EXTRUDED ALUMINUM PANELS WILL BE ALLOWED AS AN ALTERNATE TO
SIGN PANEL DETAILS FOR TYPE "D" AND "E" GROUND MOUNTED SIGNS
ONLY. NUMBER AND SPACING OF POST SHALL MATCH THOSE SHOWN FOR PANEL DETAILS.

ALL 12" EXTRUDED ALUMINUM PANELS SHALL BE ALUMINUM ALLOY 6063-T6.
ALL POST CLIPS SHALL BE ALUMINUM ALLOY 356-T6.
ALL EXTRUDED PANEL BOLTS AND POST CLIP BOLTS SHALL BE ALUMINUM.
ALL HEX LOCK NUTS SHALL BE ALUMINUM ALLOY 2017-T4.
ALL POST CLIP BOLTS SHALL BE TORQUED TO A MINIMUM OF 175 IN-LBS.
ALL POST CLIP BOLTS SHALL HAVE HEADS DESIGNED TO FIT THE BOLT SLOTS IN THE PANELS.

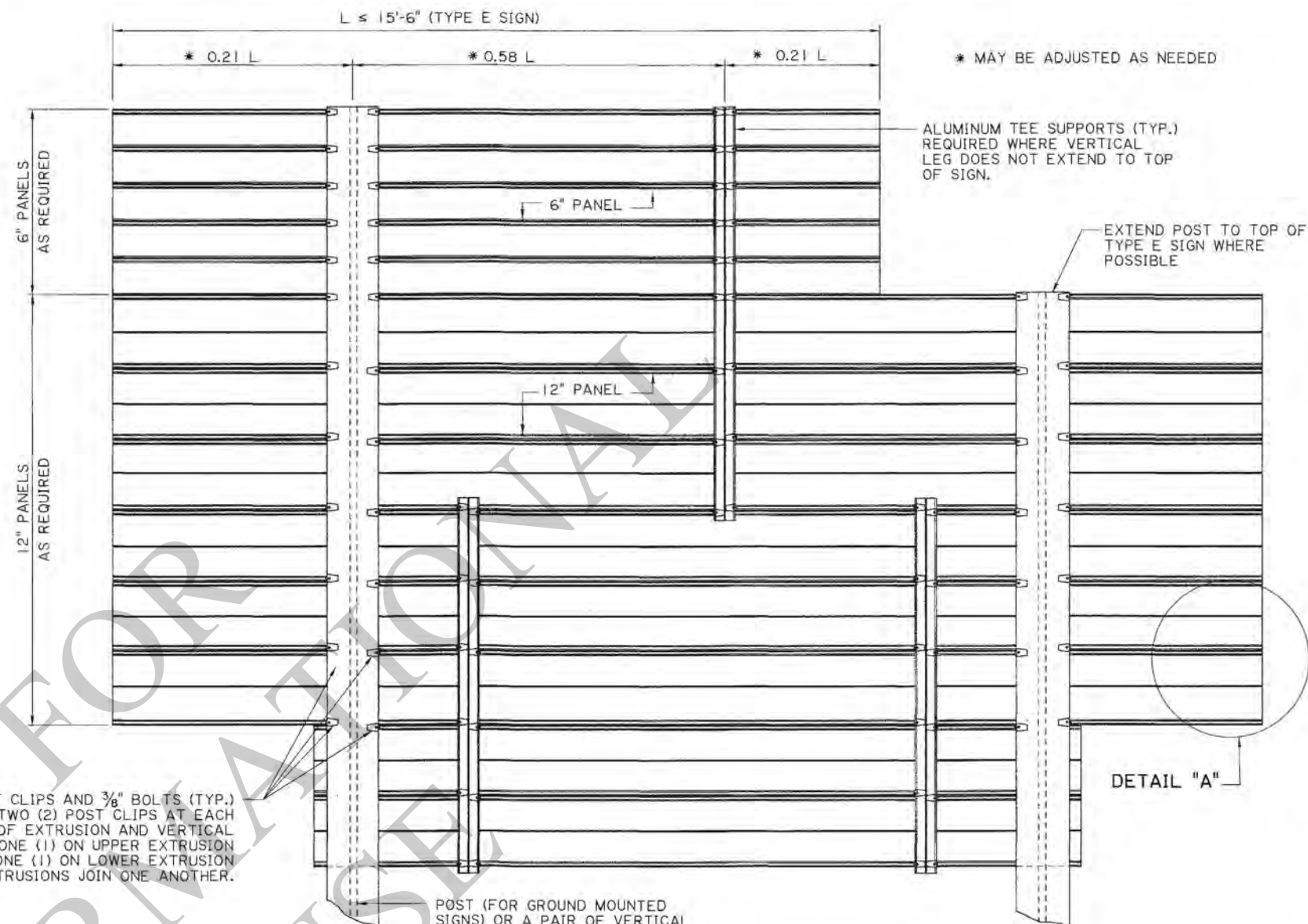
TYPE E SIGNS SHALL BE ATTACHED TO PRIMARY SIGNS WITH ALUMINUM TEE SUPPORTS,
(5'-1" LENGTH), POST CLIPS, POST CLIP BOLTS, AND HEX LOCK NUTS.

FOR NEW OVERHEAD SIGNS (INCLUDING FASCIA MOUNTED) INCORPORATING EXISTING MOUNTS, THE CONTRACTOR
WILL PLACE VERTICAL SUPPORT ANGLES WITHOUT SPLICES THAT EXTEND THE FULL HEIGHT OF THE EXTRUDED
PRIMARY SIGN PANEL.

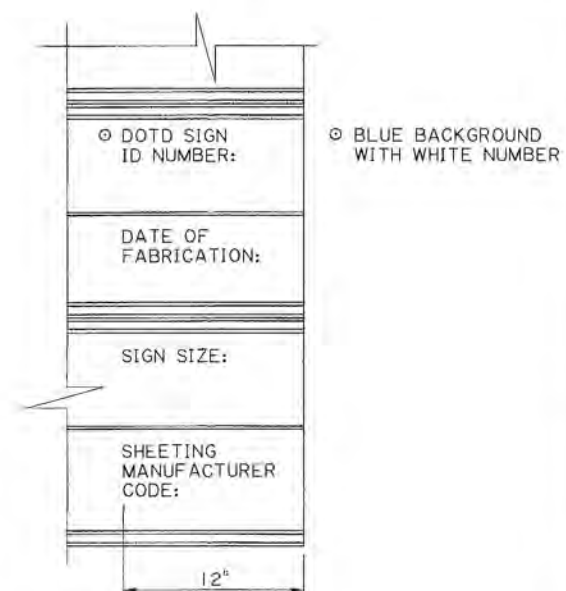
FOR NEW TYPE D SIGNS INCORPORATING EXISTING MOUNTS, THE EXISTING POST MAY BE REUSED IF THE NEW SIGN
PANEL DOES NOT EXTEND OVER 2'-0" ABOVE THE EXISTING POST. SUCH NEW SIGNS WILL BE MOUNTED TO ALUMINUM
TEE SUPPORTS BEGINNING AT THE TOP OF THE SIGN AND EXTENDING DOWNWARD FROM THE TOP OF THE POST THE
DISTANCE THE NEW SIGN IS ABOVE THE EXISTING POST PLUS 1'-0". ONE TEE IS REQUIRED ADJACENT TO EACH
EXISTING POST AND ATTACHED WITH POST CLIPS AS SHOWN FOR NEW TYPE E SIGNS. IF THE NEW SIGN EXTENDS OVER
2'-0" ABOVE THE EXISTING POST, THE CONTRACTOR IS TO REPLACE THE EXISTING POST AND MEET DETAILS FOR NEW
CONSTRUCTION.

REFLECTIVE SHEETING FOR EXTRUDED PANELS; ONLY SPLICES THAT OCCUR AS PART OF THE MANUFACTURING
PROCESS SHALL BE PERMITTED. A MAXIMUM OF TWO VERTICAL SPLICES ON ANY ONE SIGN FABRICATED USING
EXTRUDED PANELS, WITH ONE SPLICE PER EXTRUDED PANELS SHALL BE ALLOWED. ALL "EXIT ONLY" PANELS
THAT ARE DETAILED WITH THE TOP AND/OR BOTTOM EDGE NOT AT AN EXTRUDED PANEL EDGE SHALL BE
FABRICATED FROM .080" ALUMINUM AND ATTACHED AS AN OVERLAY. ALL OTHER "EXIT ONLY" PANELS SHALL BE
FABRICATED BY APPLYING THE YELLOW REFLECTIVE SHEETING ON THE EXTRUDED PANELS.
THE REFLECTIVE SHEETING APPLIED TO EXTRUDED PANELS SHALL EXTEND APPROXIMATELY
 $\frac{1}{4}$ " OVER EACH SIDE AND SHALL BE ADHERED TO THE SIDE OF THE PANEL.

THIS SHEET TO BE USED WITH WIND LOAD MAP AND GENERAL NOTE SHEET.



BACK ELEVATION



DETAIL "A"

2" LETTERING IN LAST 12" OF SIGN, SEE MISCELLANEOUS
NOTE ON GENERAL NOTE SHEET OF TRAFFIC SIGN DETAILS.

SHEET NUMBER	
PARISH	
SECTION	
STATE PROJECT	
DESIGN	K. BRAUNER
CHECK	C. GUIDRY
DETAIL	K. BRAUNER
CHECK	C. GUIDRY
REVIEW	C. BOURGEOIS
SERIES	5 OF 17



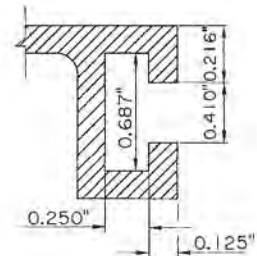
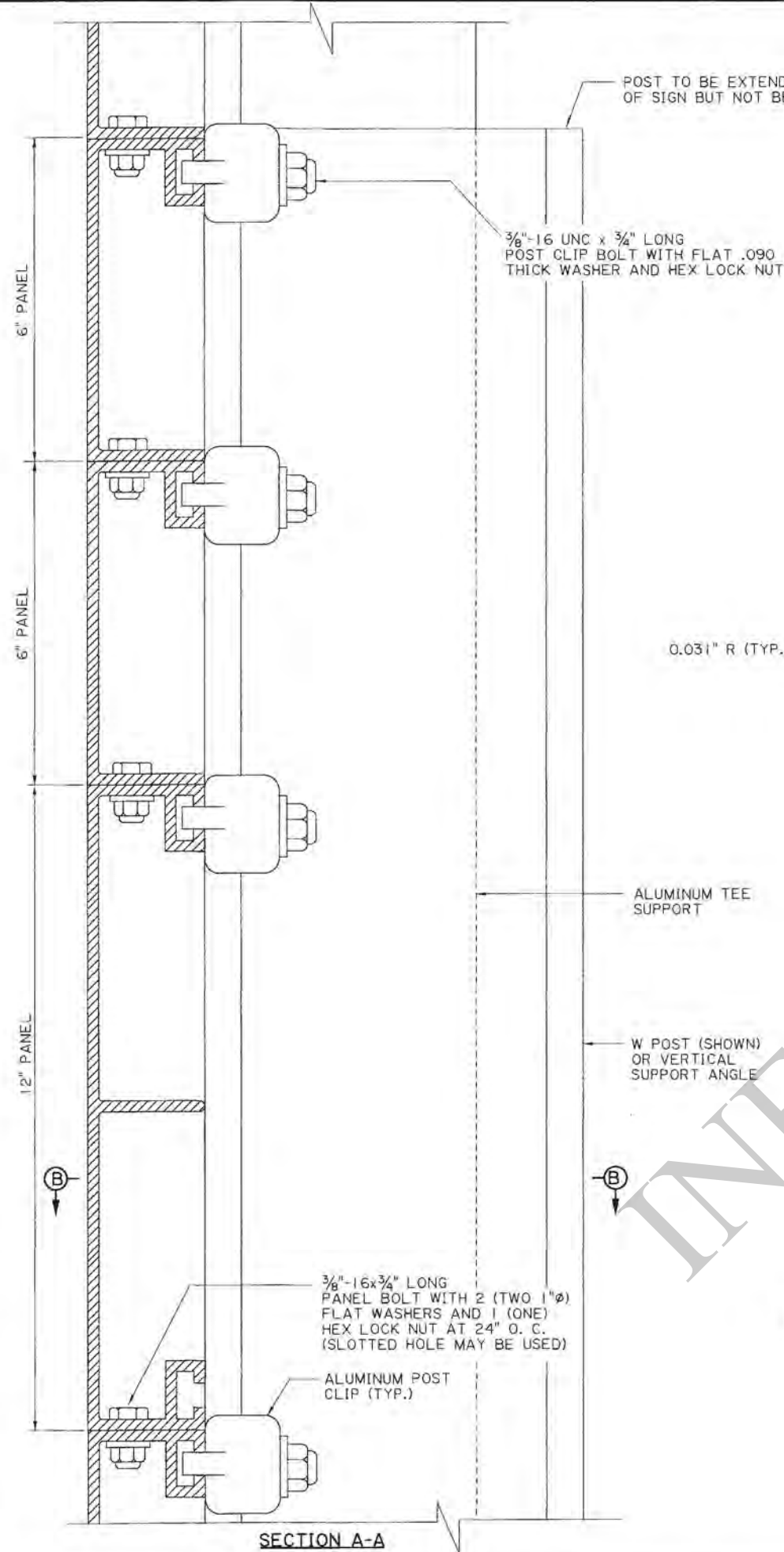
APPROVED BY: CHIEF ENGINEER:



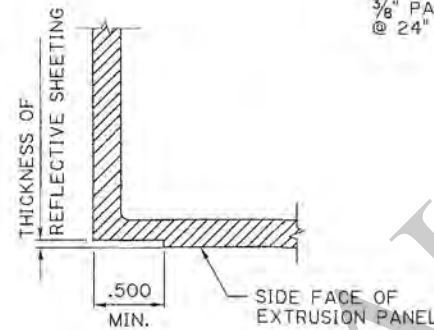
EXTRUDED ALUMINUM SIGNS
(TYPE D & E SIGNS)

ROADSIDE SIGNING STANDARDS

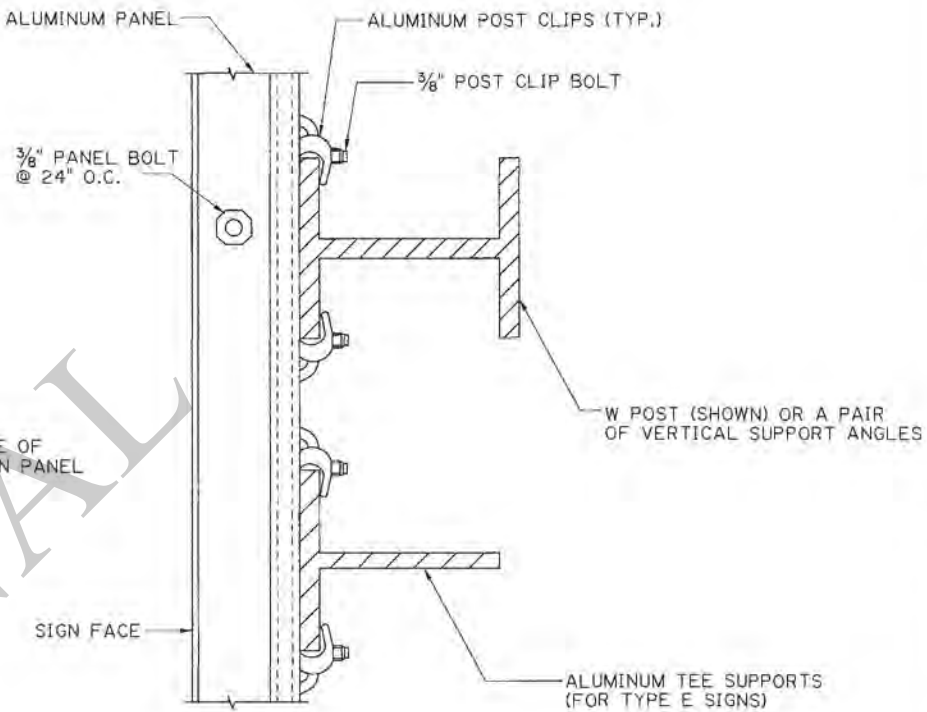




DETAIL "A"

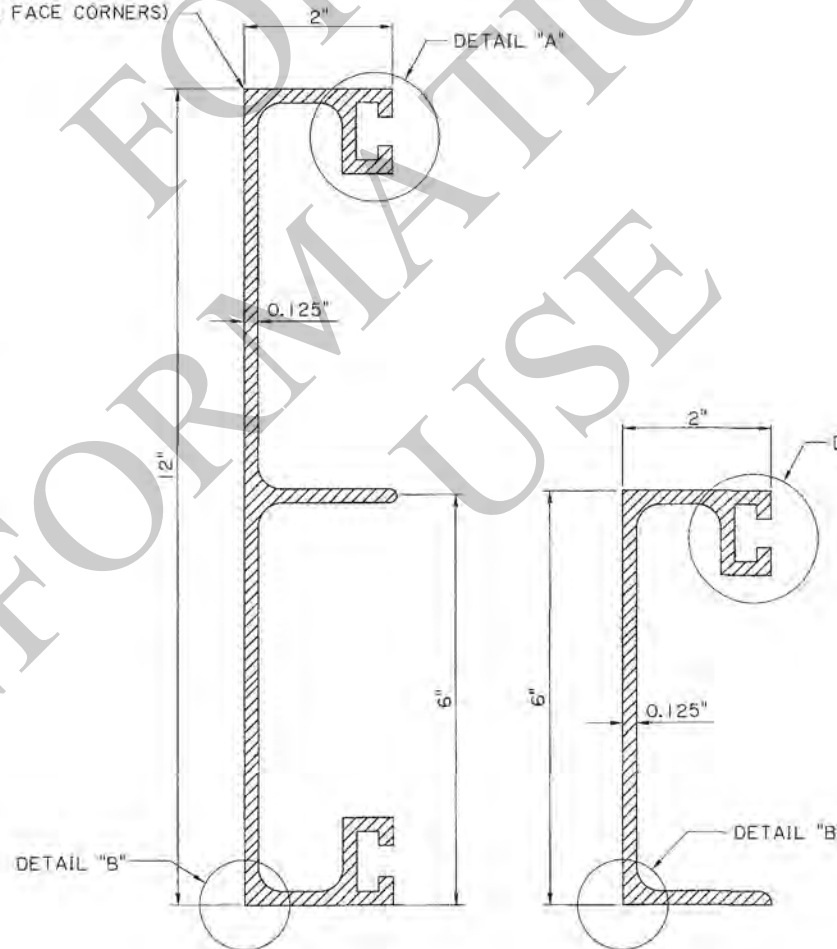


DETAIL "B"



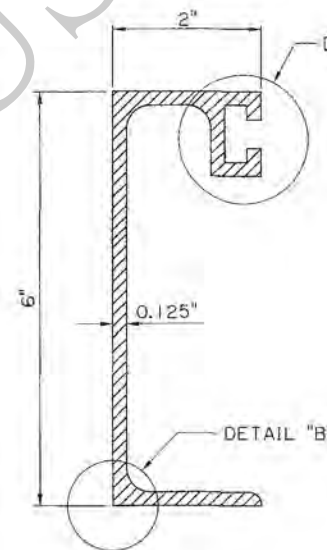
SECTION B-B

0.031" R (TYP. FACE CORNERS)



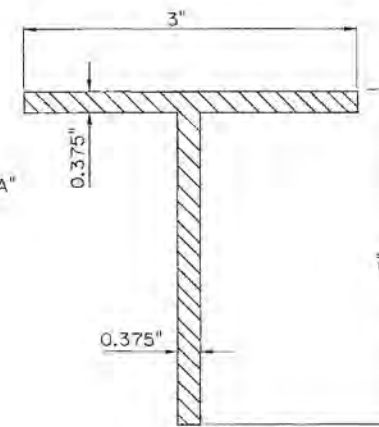
12" PANEL

MINIMUM WALL THICKNESS IS 0.080" UNLESS OTHERWISE SPECIFIED

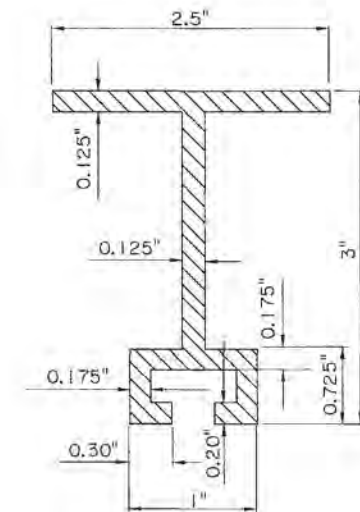


6" PANEL

MINIMUM WALL THICKNESS IS 0.080" UNLESS OTHERWISE SPECIFIED



3"x3"x3/8"



3"x2.5"

ALUMINUM TEE SUPPORTS FOR TYPE E SIGNS

SHEET NUMBER		PARISH		CONTROL SECTION		STATE PROJECT	
DESIGN	K. BRAUNER	CHECK	DETAIL	CHECK	REVIEW	SERIES	

APPROVED BY CHIEF ENGINEER: *[Signature]* DATE: 7/1/2022

EXTRUDED ALUMINUM PANELS (TYPE D & E SIGNS)

ROADSIDE SIGNING STANDARDS

STANDARD PLAN

DOTD
LOUISIANA DEPARTMENT OF TRANSPORTATION & DEVELOPMENT

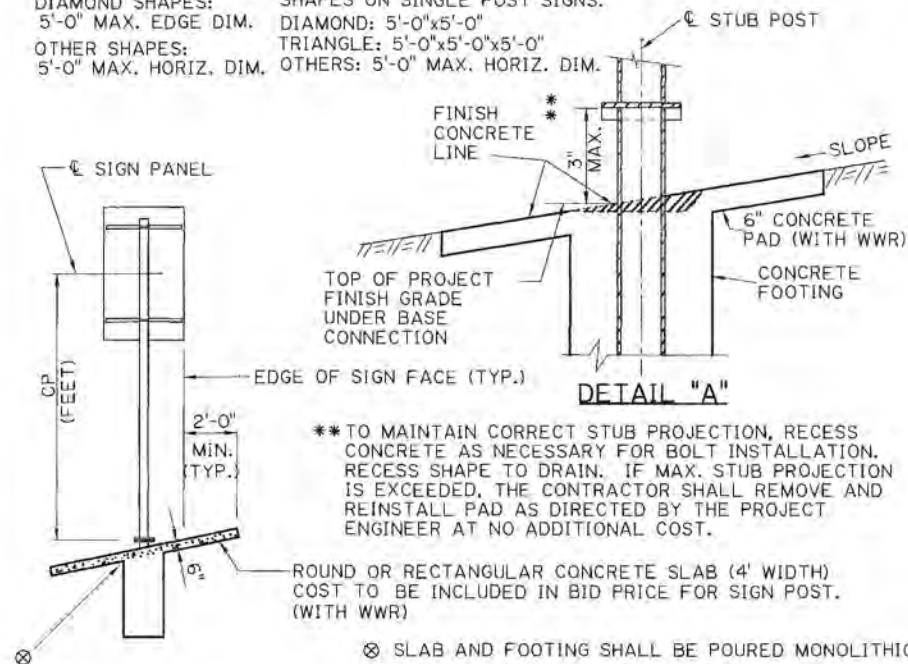
BRIDGE AND STRUCTURAL DESIGN

TYPE A SIGN

RECTANGULAR SHAPES:
4'-0" MAX. HORIZ. DIM.
DIAMOND SHAPES:
5'-0" MAX. EDGE DIM.
OTHER SHAPES:
5'-0" MAX. HORIZ. DIM.

TYPE B SIGN

CLUSTER ASSEMBLY
MAX. DIM. FOR DIFFERENT SIGN BLANK
SHAPES ON SINGLE POST SIGNS.
DIAMOND: 5'-0"x5'-0"
TRIANGLE: 5'-0"x5'-0"x5'-0"
OTHERS: 5'-0" MAX. HORIZ. DIM.



SINGLE POST MOUNTS	
TOTAL SQ. FT. SIGN AREA	
STEEL ALTERNATE	
CP	ZONE I
5	10
6	11
7	12
8	13
9	14
10	15
11	16
12	17
13	18
14	19
15	20
16	21

SINGLE POST PIPE & TUBE SECTIONS	
NO.	STEEL
1	2 1/2" Ø SCH. 40
2	3 1/2" Ø SCH. 40
3	5" Ø SCH. 40
4	6" Ø SCH. 40

NOTES:

W POST SECTIONS AND TABLE:
COLUMNS HEADED BY THE NUMBERS 27 AND 20
REPRESENT THE DESIGN WIND PRESSURE IN
POUNDS PER SQUARE FOOT.
SEE ACCOMPANYING LOUISIANA WIND MAP
TO DETERMINE THE DESIGN WIND PRESURE.
L - LENGTH OF SIGN PANEL DESIGNED.
H - HEIGHT OF SIGN PANEL DESIGNED.
ALL DIMENSIONS ARE IN INCREMENTS OF EVEN
FEET.

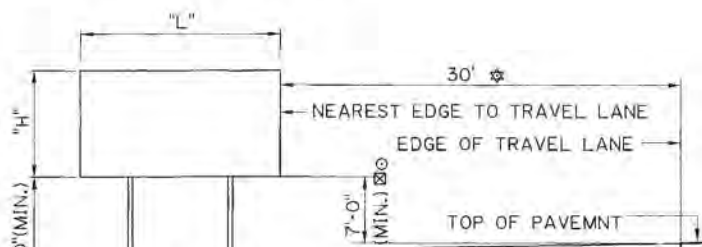
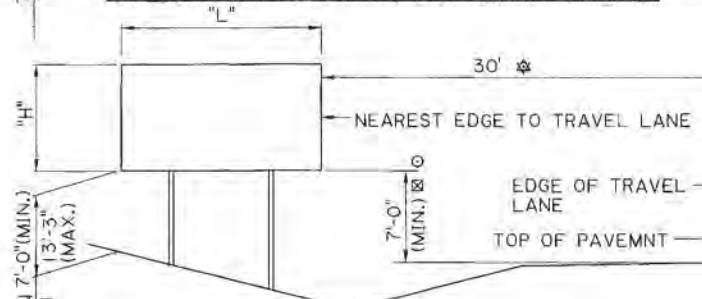
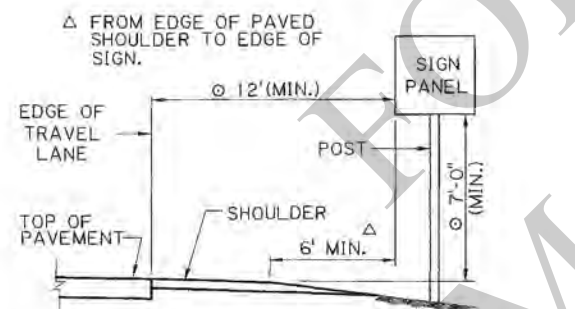
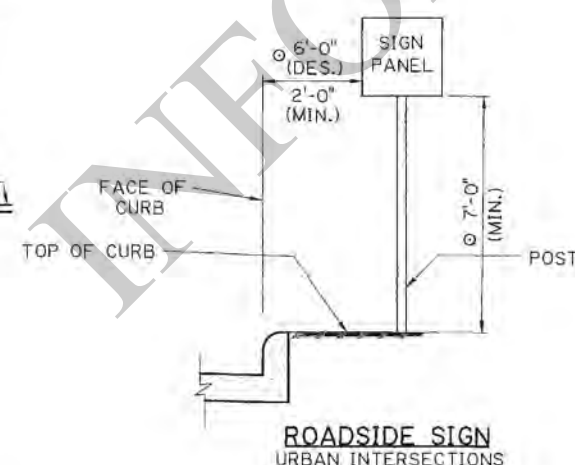
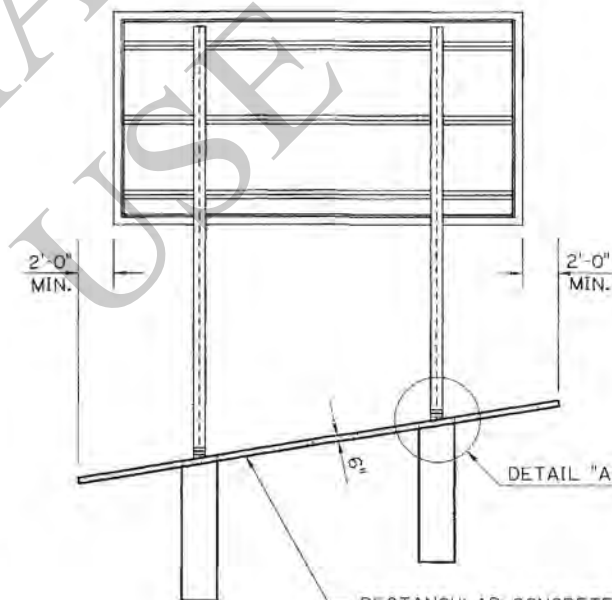
THIS SHEET TO BE USED WITH WIND LOAD MAP
AND GENERAL NOTE SHEET.

CONCRETE SLAB TO BE REINFORCED WITH A.S.T.M.
A1064 WWR 4x4-W4.0 x W4.0 AND FINISHED IN
ACCORDANCE WITH LA. STD. SPECS. 805.08.5.

- 30' MAX. (15' MIN.) FOR FREEWAYS AND EXPRESSWAYS.
15' FOR FRONTAGE ROADS, "BRIDGE ICES BEFORE ROAD"
SIGNS, AND TYPE D RAMP SIGNS. SEE SIGN SUMMARY
SHEETS. PROJECT ENGINEER MAY ADJUST ON A CASE-
BY-CASE BASIS.
- 7' MINIMUM FOR ROUTE MARKERS, WARNING AND
REGULATORY SIGNS. 8' MINIMUM FOR GUIDE SIGNS WHEN
SECONDARY SIGN MOUNTED BELOW.
- MOUNTING HEIGHT SHALL BE 7'-0" MIN. UNLESS OTHERWISE
NOTED ON THE SIGN SUMMARY SHEET. CHEVRON SIGNS
(W1-8) MAY BE INSTALLED AT 4'-0" OR HIGHER.

W POST SECTIONS FOR DOUBLE & TRIPLE POST MOUNTINGS											
PL	STEEL	PL	STEEL	PL	STEEL	PL	STEEL	PL	STEEL	PL	STEEL
L H	27 20	L H	27 20	L H	27 20	L H	27 20	L H	27 20	L H	27 20
5 1	1 1	12 5	2 1	16 15	4 4	21 8	3 3	26 1	1 1	31 1	1 1
5 2	1 1	12 6	2 2	16 16	4 4	21 9	4 3	26 2	1 1	31 2	1 1
5 3	1 1	12 7	2 2	17 4	2 2	21 10	4 3	26 3	1 1	31 3	1 1
5 4	1 1	12 8	2 2	17 5	2 2	21 11	4 4	26 4	1 1	31 4	1 1
5 5	1 1	12 9	2 2	17 6	2 2	21 12	4 4	26 5	1 1	31 5	1 1
5 6	1 1	12 10	2 2	17 7	3 2	21 13	4 3	26 6	1 1	31 6	1 1
6 1	1 1	12 11	3 2	17 8	3 2	21 14	4 3	26 7	1 1	31 7	1 1
6 2	1 1	12 12	3 2	17 9	3 3	21 15	4 4	26 8	1 1	31 8	1 1
6 3	1 1	12 13	3 3	17 10	3 3	21 16	4 4	26 9	1 1	31 9	1 1
6 4	1 1	13 1	1 1	17 11	4 3	22 4	2 2	27 1	1 1	32 1	1 1
6 5	1 1	13 4	1 1	17 12	4 3	22 5	2 2	27 2	1 1	32 2	1 1
6 6	1 1	13 5	2 1	17 13	3 3	22 6	3 2	27 3	1 1	32 3	1 1
6 7	1 1	13 6	2 2	17 14	3 3	22 7	3 3	27 4	1 1	32 4	1 1
7 2	1 1	13 7	2 2	17 15	4 3	22 8	3 3	27 5	1 1	32 5	1 1
7 3	1 1	13 8	2 2	17 16	4 3	22 9	4 3	27 6	1 1	32 6	1 1
7 4	1 1	13 9	2 2	18 3	2 1	22 10	4 3	27 7	1 1	32 7	1 1
7 5	1 1	13 10	3 2	18 4	2 2	22 11	4 4	27 8	1 1	32 8	1 1
7 6	1 1	13 11	3 2	18 5	2 2	22 12	4 4	27 9	1 1	32 9	1 1
7 7	1 1	13 12	3 3	18 6	2 2	22 13	4 4	27 10	1 1	32 10	1 1
7 8	1 1	13 13	3 3	18 7	3 2	22 14	4 4	27 11	1 1	32 11	1 1
8 2	1 1	13 14	4 3	18 8	3 2	22 15	4 4	27 12	1 1	32 12	1 1
8 3	1 1	14 3	1 1	18 9	3 3	22 16	4 4	27 13	1 1	32 13	1 1
8 4	1 1	14 4	2 1	18 10	3 3	23 4	2 2	28 1	1 1	33 1	1 1
8 5	1 1	14 5	2 2	18 11	4 3	23 5	3 2	28 2	1 1	33 2	1 1
8 6	1 1	14 6	2 2	18 12	4 3	23 6	3 3	28 3	1 1	33 3	1 1
8 7	1 1	14 7	2 2	18 13	3 3	23 7	3 3	28 4	1 1	33 4	1 1
8 8	2 1	14 8	2 2	18 14	4 3	23 8	4 3	28 5	1 1	33 5	1 1
8 9	2 1	14 9	3 2	18 15	4 3	23 9	4 3	28 6	1 1	33 6	1 1
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12 4	1 1	16 14	4 3	21 7	3 3	25 15	5 4	30 12	1 1	35 12	1 1

W SECTIONS	
NO.	STEEL
1	W6x12
2	W8x18
3	W8x24
4	W10x33
5	W12x40
6	W12x45

REAR ELEVATION OF SINGLE POST MOUNTING**DETAIL FOR ALL SIGNS LOCATED ON FORE SLOPE (TWO SUPPORTS SHOWN)****DETAIL FOR ALL SIGNS LOCATED ON BACK SLOPE (TWO SUPPORTS SHOWN)****LOCATION OF ALL GROUND MOUNTED SIGN STRUCTURES (TWO SUPPORTS SHOWN)****ROADSIDE SIGN RURAL INTERSECTIONS****ROADSIDE SIGN URBAN INTERSECTIONS****REAR ELEVATION OF MULTI - POST MOUNTING**

RECTANGULAR CONCRETE SLAB 4' WIDE BY 6" THICK, WITH WWR. TO BE INCLUDED IN PRICE BID FOR SIGN POST.

SHEET NUMBER

DESIGN: K. BRAUNER
CHECK: C. GUIDRY
DETAIL: K. BRAUNER
REVIEW: C. GUIDRY

PARISH:
CONTROL SECTION:
STATE PROJECT:
SERIES: 7 OF 17

STATE OF LOUISIANA
KURT W. BRAUNER
License No. 3267
PROFESSIONAL ENGINEER
IN
CIVIL ENGINEERING
6/24/22

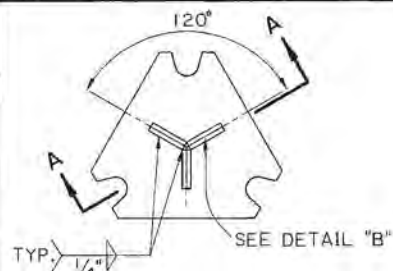
APPROVED BY CHIEF ENGINEER:
DATE: 7/1/2022

STATE OF LOUISIANA
BRIDGE AND STRUCTURAL DESIGN

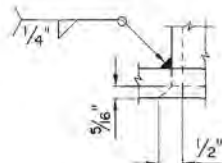
ROADSIDE MOUNTED SIGNS (TYPE A, B, & D SIGNS)

STANDARD PLAN
ROADSIDE SIGNING STANDARDS

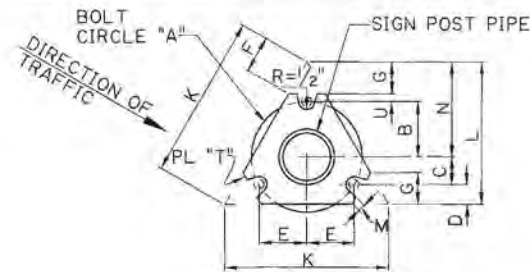
DOTD
LOUISIANA DEPARTMENT OF TRANSPORTATION & INFRASTRUCTURE



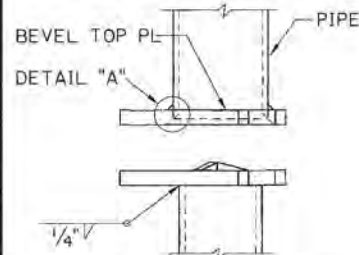
TOP VIEW STUB POST



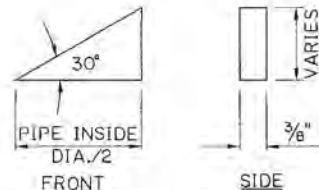
DETAIL "A"



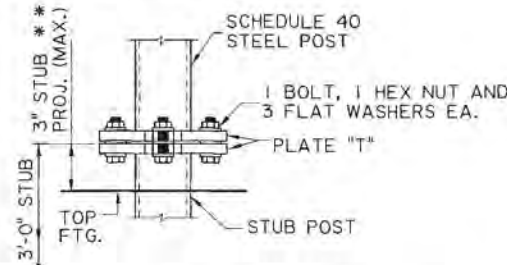
PLAN OF BASE



SECTION A-A

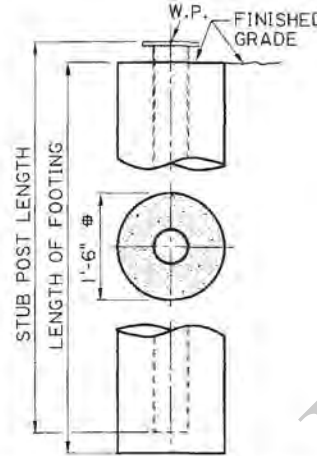


DETAIL "B"
3 REQ'D.



ELEVATION OF BASE CONNECTION
STEEL

** IF MAX. STUB PROJECTION IS EXCEEDED, CONTRACTOR SHALL REMOVE AND REINSTALL PAD AS DIRECTED BY THE PROJECT ENGINEER AT NO COST TO THE DEPARTMENT.



FOR 2 1/2" (STEEL) POST SECTIONS, FOOTING DIAMETER SHALL BE 1'-0"

FOOTING DETAIL
PIPE SECTIONS

POST DIA.	STUB L	FOOTING L	CU.YD. CONC.
2 1/2"	36"	36"	0.09
3 1/2"	36"	36"	0.20
5"	48"	48"	0.26

PROCEDURE FOR ASSEMBLY OF BASE CONNECTION:

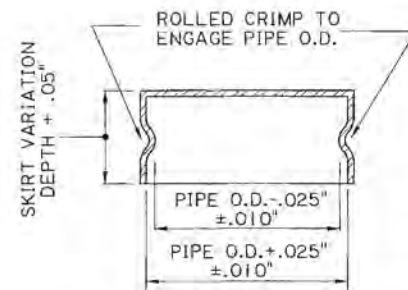
SPECIAL CARE SHALL BE TAKEN TO SET THE BASE PLUM TO AVOID EXCESSIVE SHIMMING AT THE BREAK-AWAY FEATURE AFTER FINAL INSTALLATION. EXCESSIVE SHIMMING COULD IMPAIR THE BREAK-AWAY FEATURE FOR WHICH THIS INSTALLATION WAS DESIGNED.

1. BASE SHALL BE ALIGNED AND SET PLUM BEFORE OR IMMEDIATELY AFTER POURING CONCRETE FOOTING.
2. H.S. BOLTS IN BASE PLATE SHALL BE TIGHTENED TO THE PRESCRIBED TORQUE. CARE SHALL BE TAKEN TO AVOID OVERTIGHTING.

FRICTION CAPS:

CAPS MAY BE MANUFACTURED FROM EITHER HOT ROLLED OR COLD ROLLED STEEL SHEETS. FOR PIPE SIZES 3 1/2" AND SMALLER THE MINIMUM SHEET METAL THICKNESS SHALL BE 24 GAUGE. THE RIM EDGES SHALL BE REASONABLY STRAIGHT AND SMOOTH. CAPS SHALL BE SIZED AND FORMED IN SUCH A MANNER AS TO PRODUCE A DRIVE-ON FRICTION FIT AND HAVE NO TENDENCY TO ROCK WHEN SEATED ON THE PIPE. THE DEPTH SHALL BE SUFFICIENT TO GIVE POSITIVE PROTECTION AGAINST ENTRANCE OF RAINWATER. THEY SHALL BE FREE OF SHARP CREASES OR INDENTATIONS AND SHOW NO EVIDENCE OF METAL FRACTURE. CAPS SHALL HAVE A ELECTRODEPOSITED COATING OF ZINC IN ACCORDANCE WITH THE REQUIREMENTS OF A.S.T.M. SPECIFICATION B633 SC4, TYPE 1.

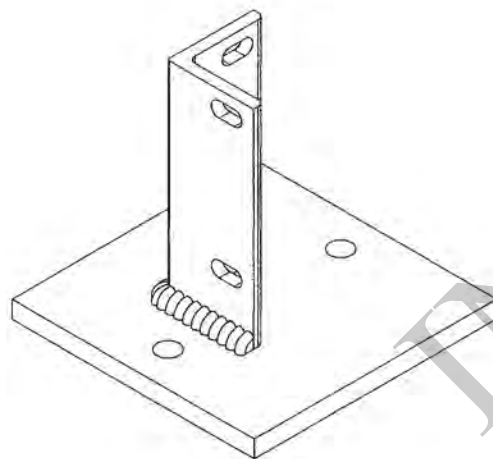
THIS SHEET TO BE USED WITH WIND LOAD MAP AND GENERAL NOTE SHEET.



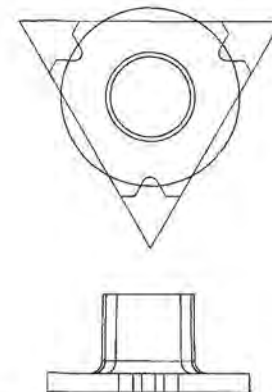
FRICTION CAP DETAIL
USED AT TOP OF ALL POSTS

STEEL MULTI-DIRECTIONAL BASE CONNECTION DATA																
NOMINAL PIPE SIZE	BOLT SIZE & TORQUE	WELD SIZE	T	Y	A	B	C	D	E	F	G	K	L	M	N	U
2 1/2" OR 3 1/2" DIA.	5/8" T=226	3/8"	5/8"	7"	7"	3 1/2"	1 3/4"	1 1/4"	3"	2 5/16"	2"	10 3/8"	9"	1 1/2"	6"	1 1/2"

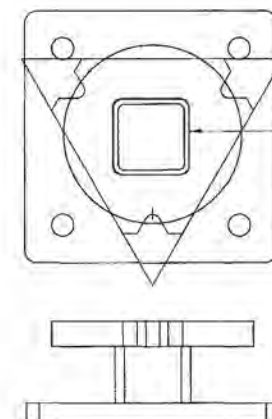
FOR STUB POST LENGTH & FOOTING DIMENSION SEE TABLE BELOW AND FOOTING DETAIL.
⊙ TORQUE IN INCH-LBS., BOLTS ARE HIGH STRENGTH



SURFACE MOUNT FOR MILE MARKERS
(SQUARE TUBE ONLY)



TYPICAL TOP ASSEMBLY



TYPICAL BOTTOM ASSEMBLY

CONCRETE SURFACE MOUNT

SHEET NUMBER

DESIGN: K. BRAUNER
CHECK: C. GUIDRY
DETAIL: K. BRAUNER
CHECK: C. GUIDRY
REVIEW: C. BOURGEOIS
SERIES: B OF 17

STATE OF LOUISIANA
KURT M. BRAUNER
License No. 25567
PROFESSIONAL ENGINEER
IN
CIVIL ENGINEERING
6/24/22

APPROVED BY CHIEF ENGINEER:
DATE: 7/1/2022

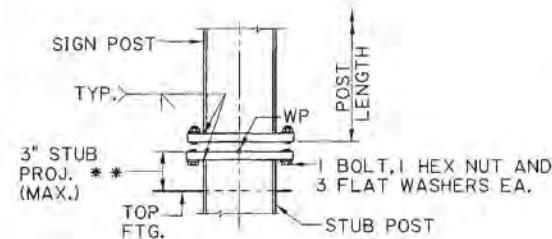
STATE OF LOUISIANA
CONFIDENTIAL

ROADSIDE MOUNTED SIGN DETAILS
(TYPE A & B SIGNS)

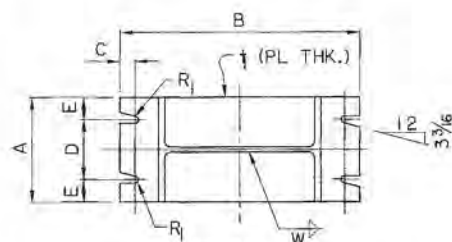
ROADSIDE SIGNING STANDARDS

DOTD
LOUISIANA DEPARTMENT OF
TRANSPORTATION & DEVELOPMENT

BRIDGE AND
STRUCTURAL
DESIGN



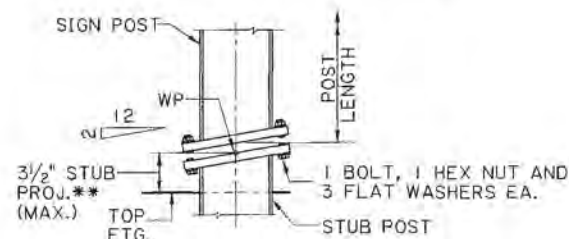
ELEVATION OF HORIZONTAL CONNECTION W SECTION



PLAN BASE PLATE AND POST

ADD 1/2" FOR BEVELED BASE PLATES

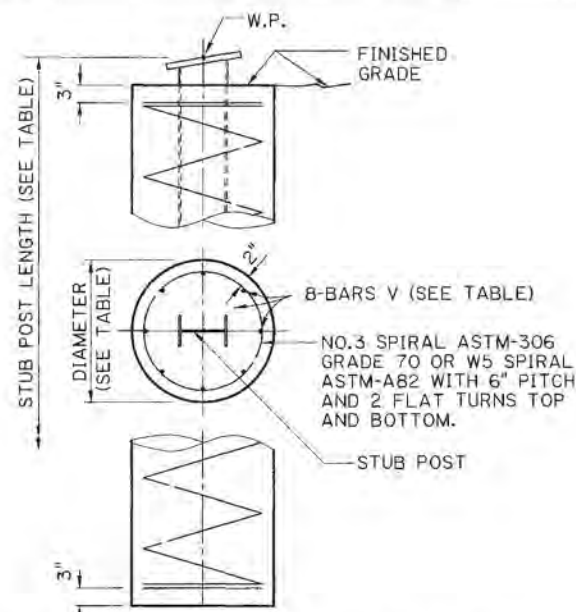
DIRECTION OF HIGHEST SPEED TRAFFIC



ELEVATION OF BEVELED CONNECTION W SECTION

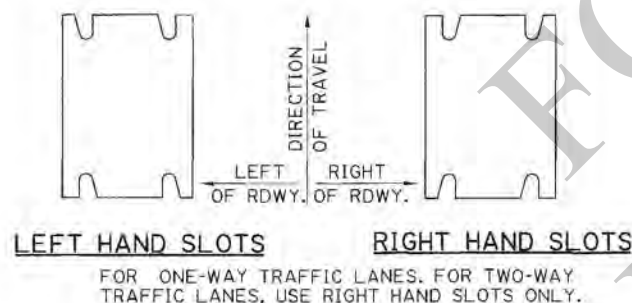
TO BE USED ON ALL MULTI-POST SIGNS WITH DISTANCE BETWEEN POSTS 7'-0" ϕ TO ϕ OR LESS.

** IF MAX. STUB PROJECTION IS EXCEEDED, CONTRACTOR SHALL REMOVE AND REINSTALL PAD AS DIRECTED BY THE PROJECT ENGINEER AT NO COST TO THE DEPARTMENT.



CONCRETE FOOTING DETAIL W SECTION

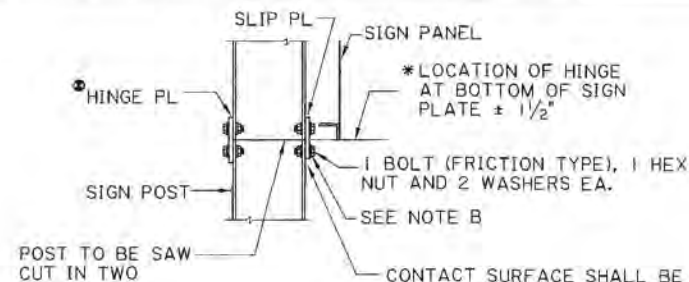
NOTE:
NO REINFORCING STEEL IS REQUIRED FOR 'S' SECTION.



TWO-WAY SLOTS
FOR GORE INSTALLATIONS

HOLES
FOR BRIDGE MOUNTED SIGNS & SIGNS BEHIND GUARDRAIL

ORIENTATION AND USE OF SLOTS AND HOLES



SLIP PLATE CONNECTION DETAIL

WHEN SIGN IS LOCATED ON SIDE OF ROADWAY WITH TWO WAY TRAFFIC, A SLIP PLATE WILL BE USED ON BOTH SIDES OF THE POST IN LIEU OF THE HINGE PLATE SHOWN

FOR EXTRUSION SIGN PANEL ALTERNATE, LOCATION OF ϕ HINGE SHALL BE 3 1/2" FROM BOTTOM OF SIGN PANEL.



*** SHIM DETAIL**
BOLTS UP TO 3/4" ϕ BOLTS

*** SHIM DETAIL**
BOLTS UP TO 1" ϕ BOLTS

* FURNISH 2 SHIMS 0.012" $\pm$ THICK AND 2 SHIMS 0.032" $\pm$ THICK PER POST. SHIMS SHALL BE BRASS CONFORMING TO A.S.T.M. SPEC. B-36 AND BE USED AS DIRECTED BY THE PROJECT ENGINEER.

SLIP PLATE CONNECTION NOTES:

1. POST SHALL BE SAW CUT OR TORCH CUT PRIOR TO GALVANIZING.
2. SLIP PLATE SHALL BE INSTALLED WITH H.S. BOLTS AT MINIMUM BOLT TENSION.
3. TIGHTING SHALL BE OBTAINED BY
(a) TURN OF NUT METHOD; OR
(b) DIRECT TENSION INDICATOR METHOD USING LOAD INDICATOR WASHER. SEE NOTE A.
4. TIGHTING SHALL BE TO SUCH A DEGREE AS TO OBTAIN MINIMUM BOLT TENSION AS SPECIFIED IN STANDARD SPECIFICATIONS SUBSECTION 807.05, CURRENT AT TIME OF FABRICATION.
5. TIGHTEN BOLTS IN A SYSTEMATIC ORDER TO THE PRESCRIBED MINIMUM BOLT TENSION.

NOTE A:

WHEN HIGH STRENGTH BOLT IS TIGHTENED BY USE OF A DIRECT TENSION INDICATOR, THE INSTALLATION AND INSPECTION SHALL BE IN ACCORDANCE WITH SPECIFICATION FOR STRUCTURAL JOINTS, SECTION 5 AND 6 FOR ASTM A-325 BOLTS APPROVED BY THE RESEARCH COUNCIL ON RIVETED AND BOLTED STRUCTURAL JOINTS. FOR DETAILED INSTALLATION AND INSPECTION PROCEDURES FOLLOWED MANUFACTURER'S RECOMMENDATIONS. CONTRACTOR SHALL BE REQUIRED TO SUBMIT BROCHURES TO THE BRIDGE DESIGN ENGINEER FOR APPROVAL.

NOTE B:

WHEN HIGH STRENGTH BOLT IS TIGHTENED BY USE OF A DIRECT TENSION INDICATOR METHOD, THE WASHER UNDER THE BOLT HEAD SHALL BE A LOAD INDICATOR WASHER.

PROCEDURE FOR ASSEMBLY OF BASE CONNECTION:

SPECIAL CARE SHALL BE TAKEN TO SET THE BASE PLUMB TO AVOID EXCESSIVE SHIMMING AT THE BREAK-AWAY FEATURE AFTER FINAL INSTALLATION. EXCESSIVE SHIMMING COULD IMPAIR THE BREAK-AWAY FEATURE FOR WHICH THIS INSTALLATION WAS DESIGNED. SHIM PACKS SHOWN ON THIS DRAWING SHOULD BE SUFFICIENT TO ALLOW FOR NORMAL MISALIGNMENT.

1. BASE SHALL BE ALIGNED AND SET PLUMB BEFORE OR IMMEDIATELY AFTER POURING CONCRETE FOOTING.
2. H.S. BOLTS IN BASE PLATE SHALL BE TIGHTENED TO THE PRESCRIBED TORQUE. CARE SHALL BE TAKEN TO AVOID OVERTIGHTING.

SECTION	DIMENSION (INCH)	BASE CONNECTION DATA										SLIP PLATE & HINGE PLATE DATA											FOOTING DATA				
		BOLT SIZE & TORQUE LIMITS	A	B	C	D	E	t ₁	R	W	W (ALT.) SEE NOTE	F	G	H	J	K	K ₁	L	M	t ₂	R ₂	H.S. BOLT DIA.	STUB LTH.	FTG. DIA.	LTH. OF FTG.	BARS V SIZE	CU. YD CONC.
W6x12	5/8"Ø T= 226-345	4	10	3/4	2	1	1 1/2	1 1/32	5/16	5/16	3 5/8	4	2 1/4	7/8	1	1 1/4	5/8	4 1/4	3/8	9/32	1/2	24	24	48	#5	0.46	
W8x18		5 1/4	12	3/4	3	1 1/8	1 1/2	1 1/32	5/16	5/16	4 1/8	5 1/4	2 3/4	1 1/4	1 1/8	1 3/8	3/4	4 3/4	1/2	1 1/32	5/8	24	24	60	#6	0.58	
W8x24	3/4"Ø T= 369-554	6 1/2	12 1/2	7/8	3 1/4	1 5/8	1 3/4	1 3/32	3/8	7/16	4 1/8	6 1/2	3 1/2	1 1/2	1 1/8	1 3/8	3/4	4 3/4	1/2	1 1/32	5/8	30	24	72	#7	0.70	
W10x33	1"Ø T= 460-735	8	15 1/2	1 1/4	4 1/2	1 3/4	2	1 7/32	3/8	7/16	4 5/8	8	5 1/2	1 1/4	1 1/4	1 1/2	7/8	5 1/4	5/8	1 3/32	3/4	30	24	96	#9	0.93	
W12x40		8	17 1/2	1 1/4	4 1/2	1 3/4	2	1 7/32	3/8	7/16	4 5/8	8	5 1/2	1 1/4	1 1/4	1 1/2	7/8	5 1/4	5/8	1 3/32	3/4	36	24	120	#10	1.16	
W12x45		10	17 1/2	1 1/4	6	2	2	1 7/32	3/8	7/16	5 1/2	10	5 1/2	2 1/4	1 1/2	1 3/4	1	6 1/4	3/4	1 5/32	7/8	36	36	96	#9	2.09	

* BASE PLATE TO POST WELD ALTERNATE (AS AN ALTERNATE TO WELDS SHOWN IN DETAILS, THE POST MEMBERS TABULATED MAY BE WELDED ALL AROUND WITH A FILLET WELD W(ALT.)) ALL BOLTS SHALL HAVE A MINIMUM OF 3 THREADS BEYOND THE NUT. BOLT TORQUE LIMITS ARE IN INCH POUNDS. (THE HIGH STRENGTH BOLTS AT THE BASE CONNECTION SHOULD BE TORQUED WITHIN THE LIMITS SPECIFIED, HOWEVER, THE LOWER LIMIT IS DESIRABLE). FOR NON-BREAKAWAY USE TORQUE LIMITS GIVEN IN THE STANDARD SPECIFICATIONS

SHEET NUMBER

DESIGN: K. BRAUNER
CHECK: C. GUIDRY
DETAIL: K. BRAUNER
REVIEW: C. GUIDRY

PARISH: _____
CONTROL SECTION: _____
STATE PROJECT: _____

DATE: 6/24/22

APPROVED BY CHIEF ENGINEER: *Michael P. Kelly*

DATE: 7/1/2022

ROADSIDE MOUNTED SIGN DETAILS (TYPE D SIGNS)

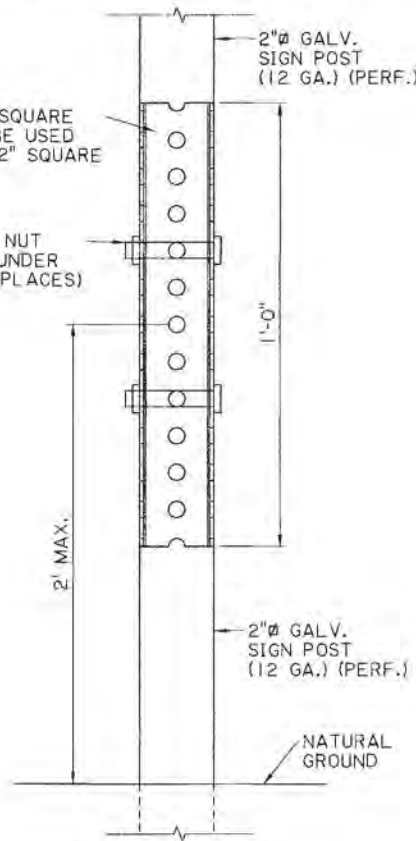
ROADSIDE SIGNING STANDARDS

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LOUISIANA DEPARTMENT OF TRANSPORTATION & DEVELOPMENT

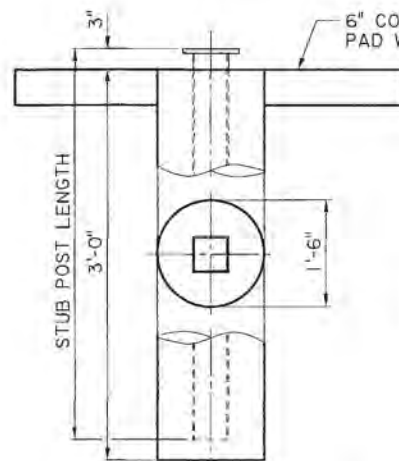
BRIDGE AND STRUCTURAL DESIGN

1 3/4" (12 GA.) PERF. SQUARE TUBING, GALV., TO BE USED AS SPLICE "INSIDE" 2" SQUARE TUBING POST

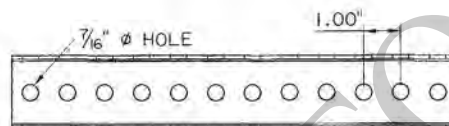
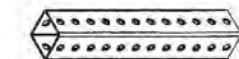
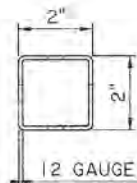
3/8" Ø 3" BOLT & NUT WITH WASHERS UNDER HEAD & NUT (4 PLACES)



SPLICE JOINT FOR SIGN 2" POST

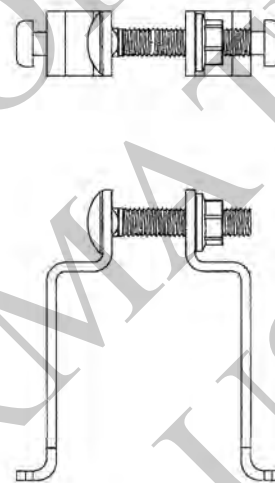


FOOTING DETAIL SQ. TUBE SECTIONS



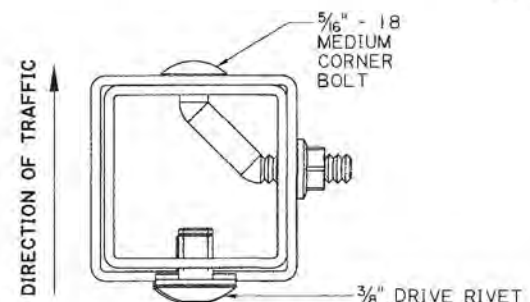
OD	GAUGE	WALL	WEIGHT PER FOOT
2.00"	12GA	0.105"	2.459#

2" SQUARE TUBING



SIGN CLAMP FOR SQUARE POSTS

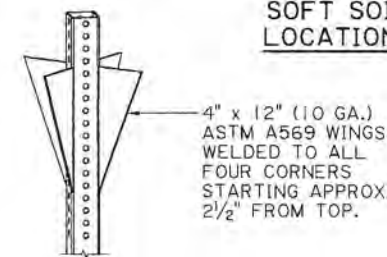
7/8" WIDE X 11 GA. TYPE 304, #2B FINISHED STAINLESS STEEL INCLUDES 3/8" - 16 X 2" CARRIAGE BOLT AND CASE HARDENED FLANGE NUT.



SECTION A-A

HARD SOIL LOCATIONS

SOFT SOIL LOCATIONS



OMNI-DIRECTIONAL ANCHOR

SIGN CENTROID (CP)	ALLOWABLE SIGN AREA (FT ²)			
	70 MPH + 30% GUST		80 MPH + 30% GUST	
	SINGLE POST (2" x 12GA PERF.)	DOUBLE POST (2" x 12GA PERF.)	SINGLE POST (2" x 12GA PERF.)	DOUBLE POST (2" x 12GA PERF.)
14'	3.99	7.98	2.99	5.97
13.5'	4.14	8.28	3.10	6.19
13'	4.30	8.59	3.21	6.43
12.5'	4.47	8.93	3.34	6.68
12'	4.65	9.30	3.48	6.96
11.5'	4.85	9.70	3.63	7.26
11'	5.07	10.14	3.79	7.59
10.5'	5.31	10.62	3.97	7.95
10'	5.57	11.15	4.17	8.34
9.5'	5.86	11.73	4.39	8.77
9'	6.19	12.37	4.63	9.26
8.5'	6.55	13.09	4.90	9.79
8'	6.95	13.90	5.20	10.40
7.5'	7.41	14.81	5.54	11.08
7'	7.93	15.86	5.93	11.86

SHEET NUMBER

DESIGN: K. BRAUNER
CHECK: C. GUIDRY
DETAIL: K. BRAUNER
REVIEW: C. GUIDRY

PARISH:
CONTROL SECTION:
STATE PROJECT:
SERIES: 10 OF 17

STATE OF LOUISIANA
KURT M. BRAUNER
License No. 30057
PROFESSIONAL ENGINEER
IN
CIVIL ENGINEERING
7/27/2022
6/24/22

APPROVED BY CHIEF ENGINEER:
DATE: 7/1/2022

STATE OF LOUISIANA
REGISTERED PROFESSIONAL ENGINEER
1990

SQUARE TUBE SIGN DETAILS

ROADSIDE SIGNING STANDARDS

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LOUISIANA DEPARTMENT OF TRANSPORTATION & DEVELOPMENT
BRIDGE AND STRUCTURAL DESIGN



Technical drawing of a sign post assembly, showing side and end views with dimensions and labels.

Labels:

- SIGN FACE
- PL. $9' \times \frac{3}{16}"$
- 5" SQ. $\times \frac{1}{2}"$ POST
- 3/8" PLATE
- 5/8" ϕ S.S. MECH. ANCHOR BOLTS (TYP.)

Dimensions:

- Side View:
 - Post width: 5"
 - Plate width: 6"
 - Plate thickness: $\frac{3}{8}"$
 - Anchor bolt spacing (center-to-center): 4"
 - Anchor bolt diameter: $\frac{1}{2}"$ (TYP.)
 - Post height: 3"
 - Base plate thickness: 1"
 - Base plate width: 2"
 - Base plate material: $\frac{1}{2}"$ (TYP.)
- End View:
 - Post width: 5"
 - Plate width: 6"
 - Plate thickness: $\frac{3}{8}"$
 - Anchor bolt spacing (center-to-center): 4"
 - Anchor bolt diameter: $\frac{1}{2}"$ (TYP.)
 - Post height: 3"
 - Base plate thickness: 1"
 - Base plate width: 2"
 - Base plate material: $\frac{1}{2}"$ (TYP.)

5/8" ϕ S.S. MECH. ANCHOR BOLTS (TYP.)

3/8" PL.

POST

1'-6"

3"

6"

6"

3"

5"

3/4"

1'-0"

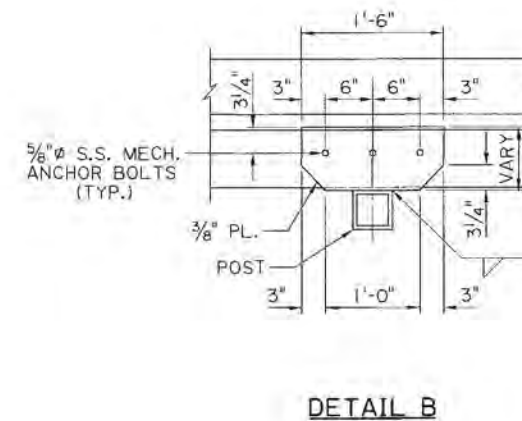
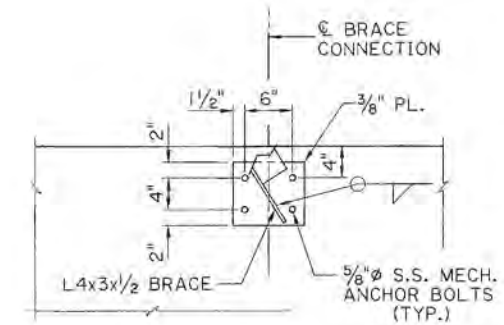
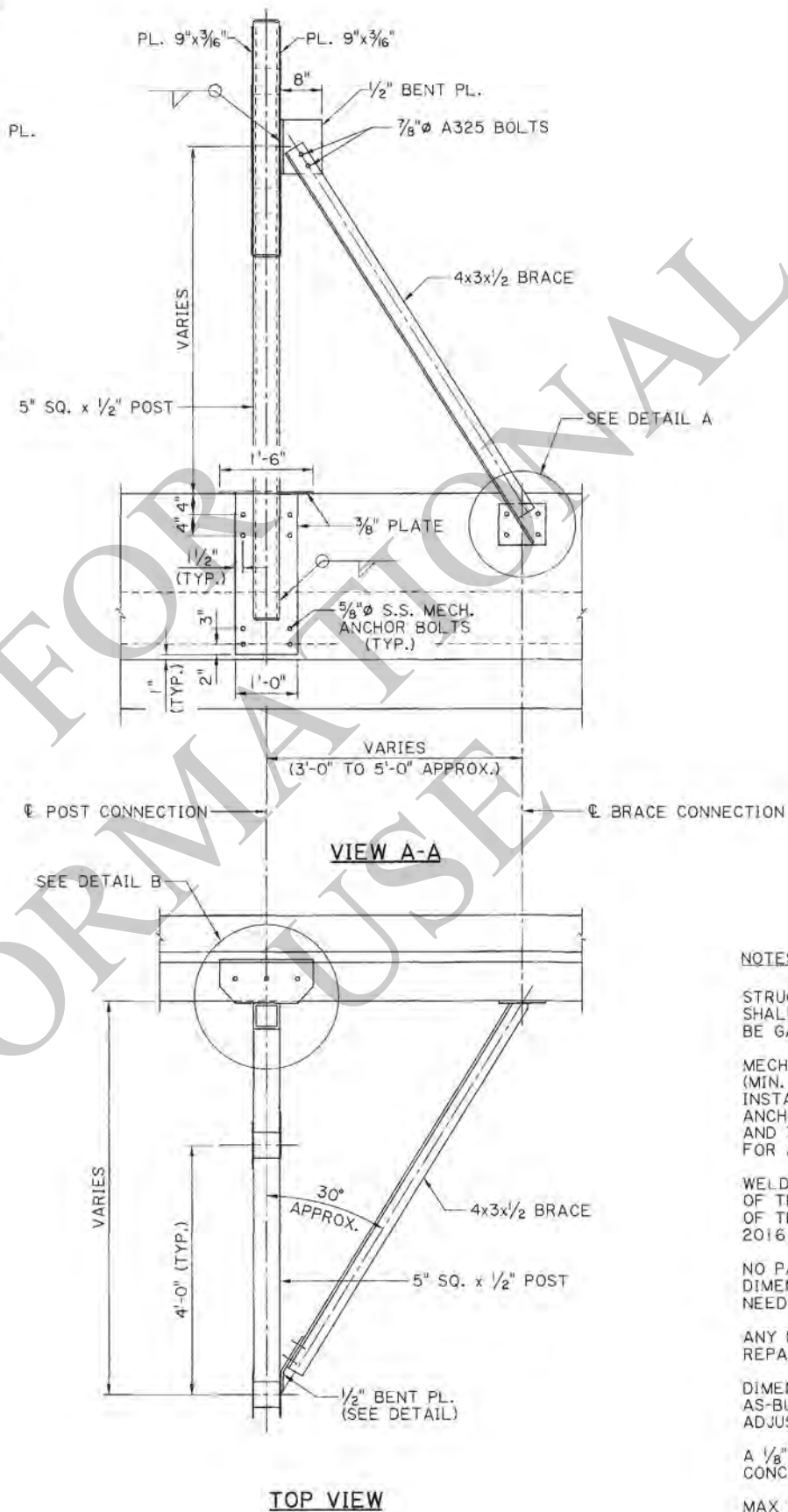
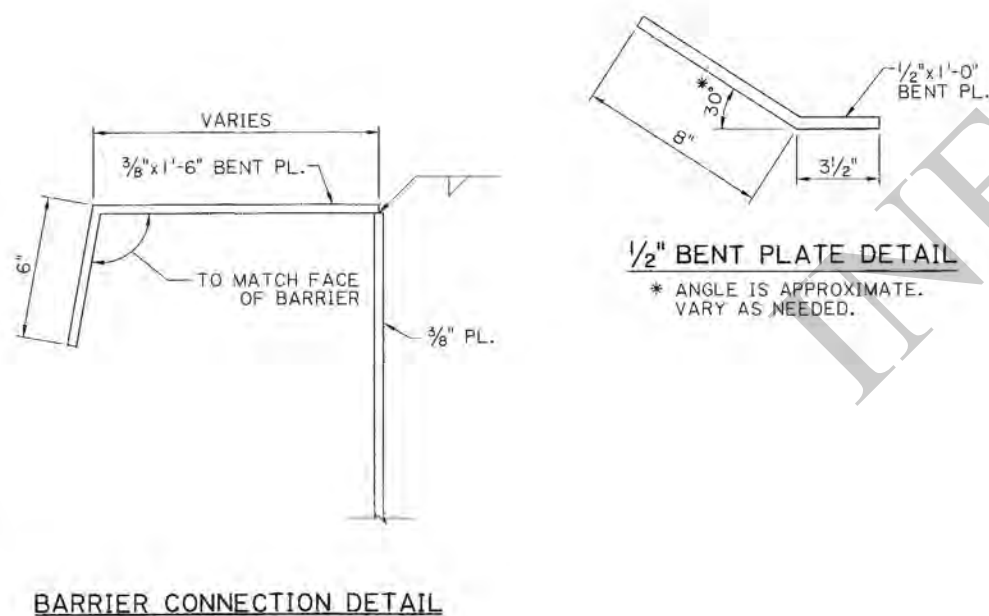
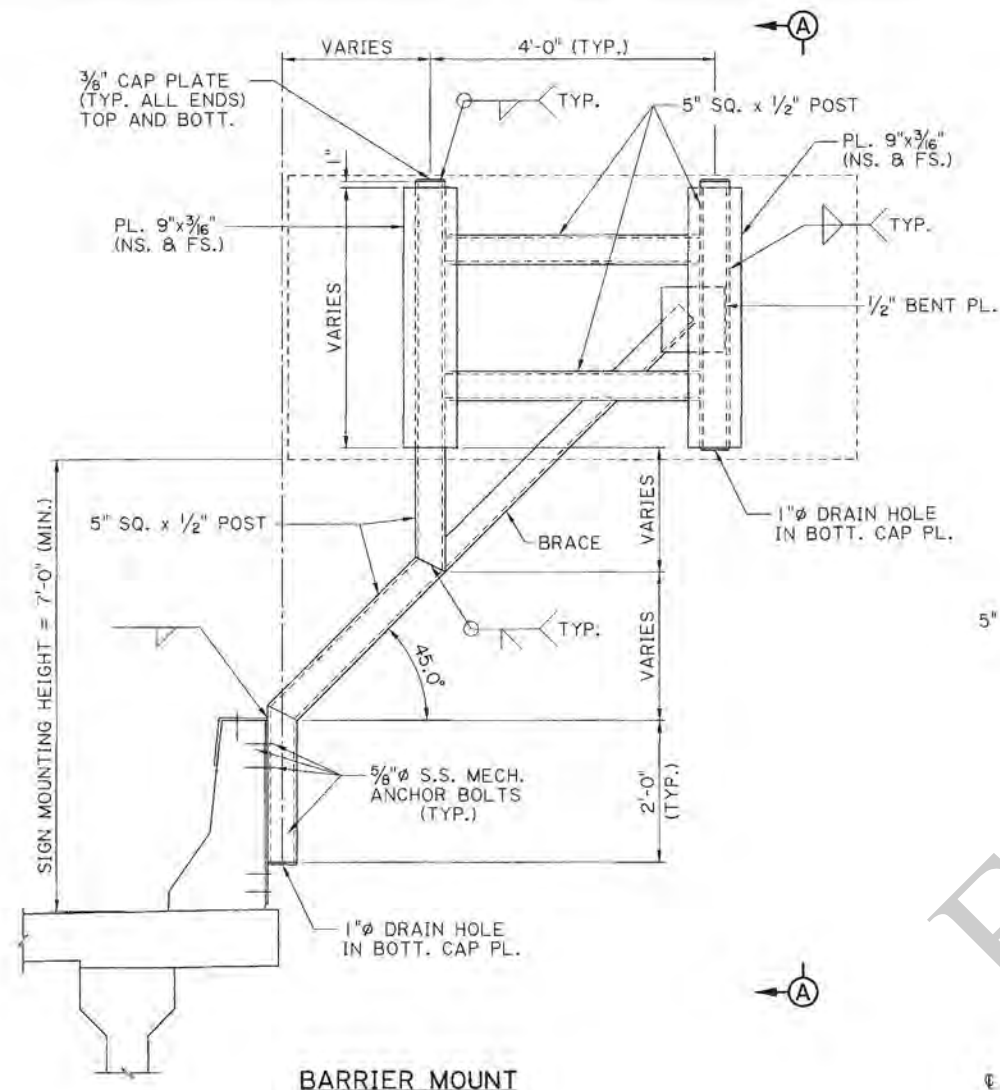
3"

SECTION A-A

MAX SIGN AREA = 20 SQFT.

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TRANSPORTATION & DEVELOPMENT

BRIDGE AND
STRUCTURAL
DESIGN

**NOTES:**

STRUCTURAL MEMBERS SHALL BE AASHTO M270 GRADE 50 STEEL AND SHALL BE HOT DIPPED GALVANIZED PER ASTM A-123. A325 BOLTS TO BE GALVANIZED PER ASTM A-153.

MECHANICAL ANCHOR BOLTS SHALL BE 5/8" STAINLESS STEEL (MIN. F_y = 55 ksi) AND SHALL BE SELECTED FROM THE A.M.I. AND INSTALLED AS PER THE MANUFACTURER'S RECOMMENDATIONS. EACH ANCHOR SHALL HAVE AN ALLOWABLE CAPACITY OF 3 KIPS PULLOUT AND 3 KIPS SHEAR AFTER APPLICATION OF ANY REDUCTION FACTORS FOR ANCHOR SPACING AND EDGE DISTANCE.

WELDING SHALL BE IN ACCORDANCE WITH THE BRIDGE WELDING CODE OF THE AMERICAN WELDING SOCIETY (AWS D1.5-10), AND SECTION 809 OF THE LOUISIANA STANDARD SPECIFICATIONS FOR ROADS AND BRIDGES, 2016 EDITION.

NO PART OF ANY SIGN SHALL PROTRUDE INTO THE SHOULDER AREA. DIMENSIONS OF SUPPORT POST AND BRACKET SHALL BE ADJUSTED AS NEEDED PRIOR TO FABRICATION.

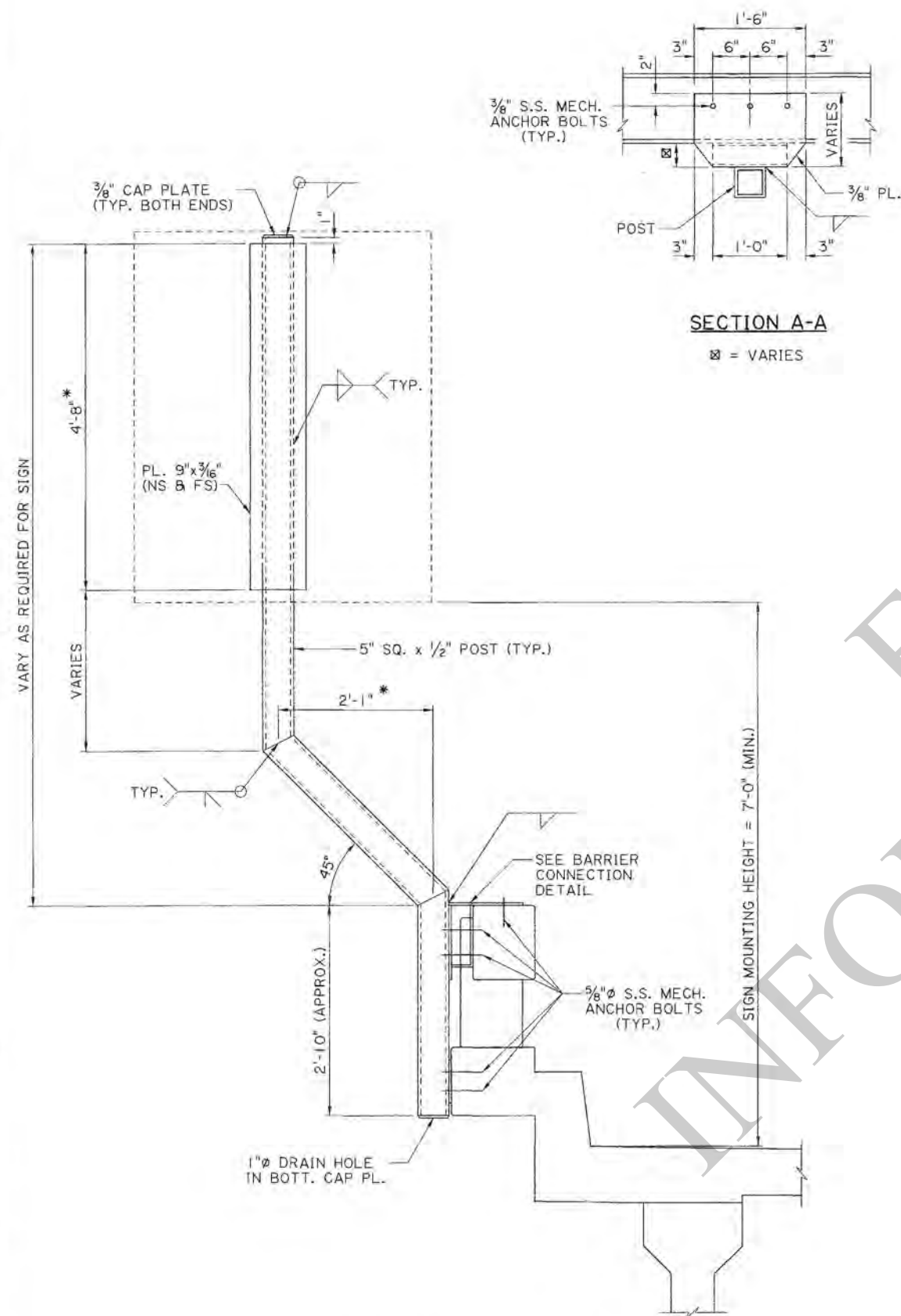
ANY PORTIONS OF THE EXISTING BARRIER THAT ARE DAMAGED SHALL BE REPAIRED TO THE SATISFACTION OF THE PROJECT ENGINEER.

DIMENSIONS RELATED TO THE BARRIER CONNECTION ARE BASED ON AS-BUILT DRAWINGS AND PREVIOUS STANDARDS. DIMENSIONS SHALL BE ADJUSTED AS NEEDED BASED ON FIELD MEASUREMENTS.

A 1/8" NEOPRENE PAD SHALL BE USED BETWEEN ALL STEEL AND CONCRETE CONTACT SURFACES.

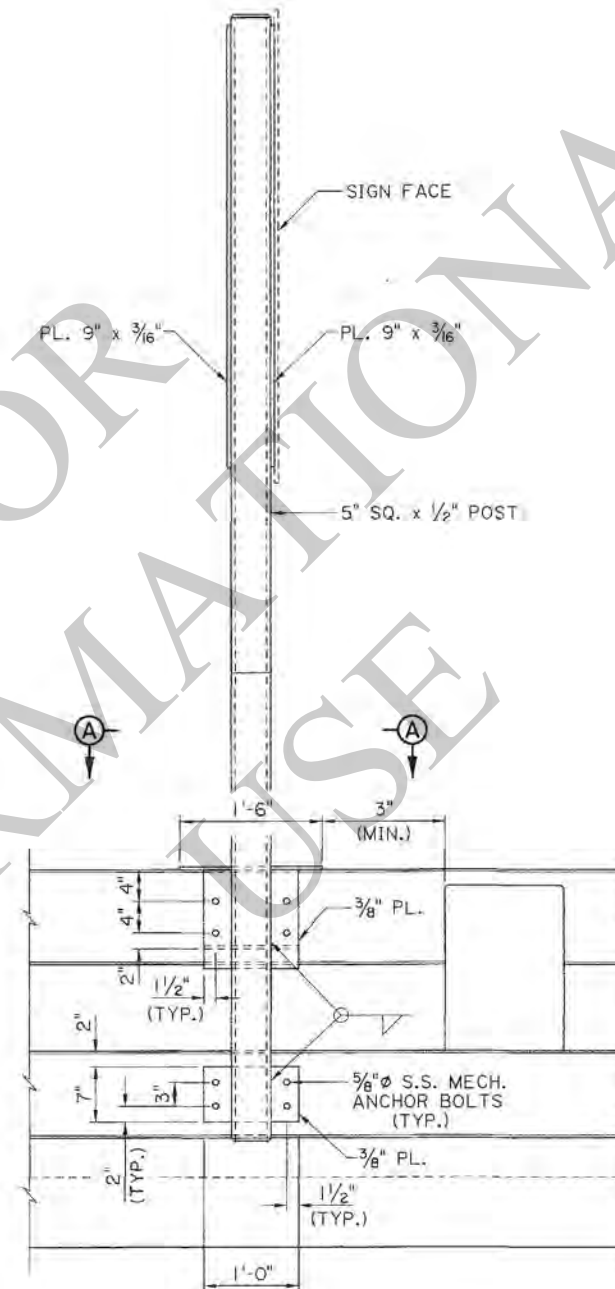
MAX SIGN AREA = 40 SQFT.

SHEET NUMBER		PARISH		CONTROL SECTION		STATE PROJECT	
DESIGN	K. BRAUNER	CHECK	V. TOURRES	DETAIL	K. BRAUNER	REVIEW	C. GUIDRY
APPROVED BY CHIEF ENGINEER:				DATE: 7/1/2022			
Z - BRACKET SIGN SUPPORTS (F - SHAPE BARRIER)				ROADSIDE SIGNING STANDARDS			
BRIDGE AND STRUCTURAL DESIGN				BRIDGE AND STRUCTURAL DESIGN			

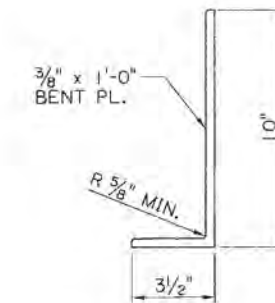


OFFSET SIGN SUPPORT

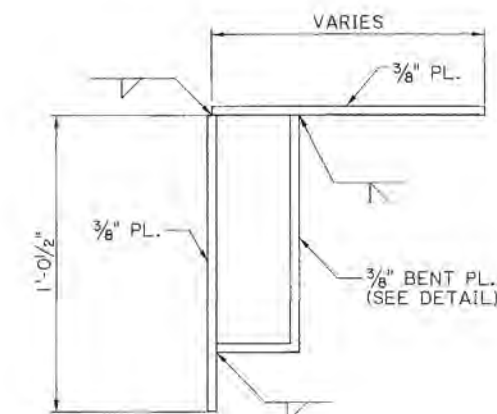
* DIMENSIONS ARE BASED ON A 5 FT. x 4 FT. SIGN.
ADJUST AS NEEDED FOR DIFFERENT SIGN SIZES.



OUTSIDE ELEVATION SHOWING BARRIER



3/8" BENT PL. DETAIL



BARRIER CONNECTION DETAIL

NOTES:

STRUCTURAL MEMBERS SHALL BE AASHTO M270 GRADE 50 STEEL AND SHALL BE HOT DIPPED GALVANIZED PER ASTM A-123.

MECHANICAL ANCHOR BOLTS SHALL BE $\frac{5}{8}$ " ϕ STAINLESS STEEL (MIN. FY = 55 ksi) AND SHALL BE SELECTED FROM THE A.M.I. AND INSTALLED AS PER THE MANUFACTURER'S RECOMMENDATIONS. EACH ANCHOR SHALL HAVE AN ALLOWABLE CAPACITY OF 3 KIPS PULLOUT AND 3 KIPS SHEAR AFTER APPLICATION OF ANY REDUCTION FACTORS FOR ANCHOR SPACING AND EDGE DISTANCE.

WELDING SHALL BE IN ACCORDANCE WITH THE BRIDGE WELDING CODE OF THE AMERICAN WELDING SOCIETY (AWS D1.5-10), AND SECTION 809 OF THE LOUISIANA STANDARD SPECIFICATIONS FOR ROADS AND BRIDGES, 2016 EDITION.

NO PART OF ANY SIGN SHALL PROTRUDE INTO THE SHOULDER AREA.
DIMENSIONS OF SUPPORT POST AND BRACKET SHALL BE ADJUSTED AS
NEEDED PRIOR TO FABRICATION.

ANY PORTIONS OF THE EXISTING BARRIER THAT ARE DAMAGED SHALL BE REPAIRED TO THE SATISFACTION OF THE PROJECT ENGINEER.

DIMENSIONS RELATED TO THE BARRIER CONNECTION ARE BASED ON AS-BUILT DRAWINGS AND PREVIOUS STANDARDS. DIMENSIONS SHALL BE ADJUSTED AS NEEDED BASED ON FIELD MEASUREMENTS.

A 1/8" NEOPRENE PAD SHALL BE USED BETWEEN ALL STEEL AND CONCRETE CONTACT SURFACES.

MAX SIGN AREA = 20 SQFT.

DESIGN	K. BRAUNER	PARISH	
CHECK	V. TOURRES	CONTROL SECTION	
DETAIL	K. BRAUNER	STATE	
CHECK	V. TOURRES	PROJECT	
REVIEW	C. GUIDRY		
SERIES	13 OF 17		
SHEET NUMBER			



APPROVED BY CHIEF ENGINEER:

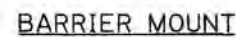
Christy S. P. Hoyle

DATE: 7/1/2012

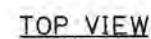
Z - BRACKET SIGN SUPPORT
(POST AND RAIL BARRIER)

ROADSIDE SIGNING STANDARDS





3/8" BENT PL. DETAIL

[illegible]

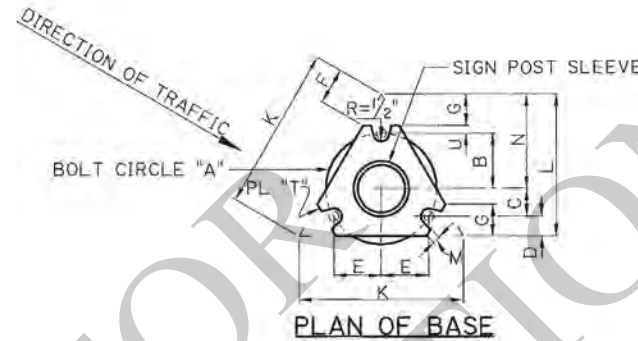
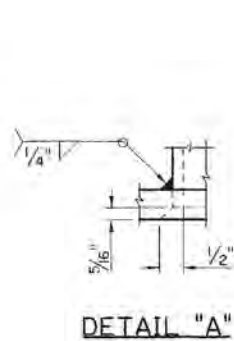
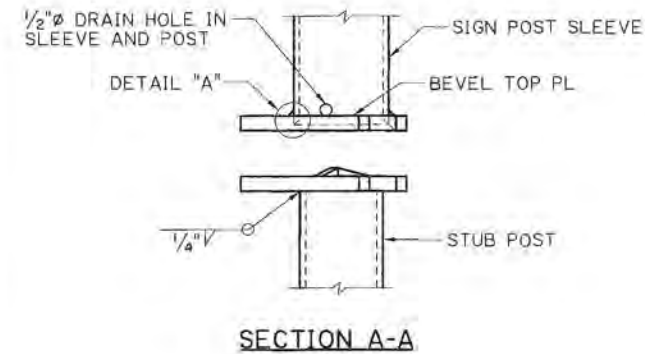
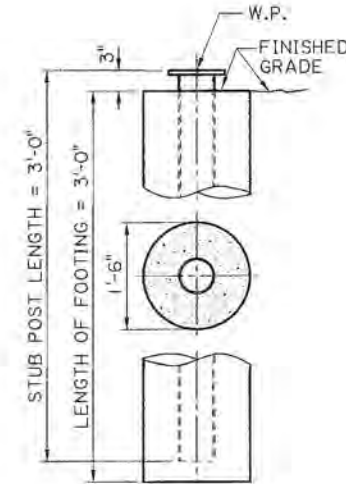
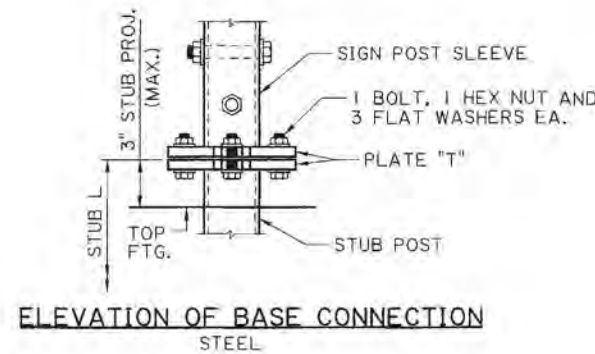
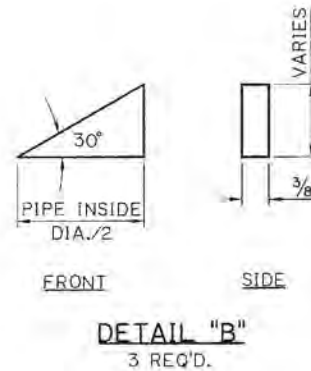
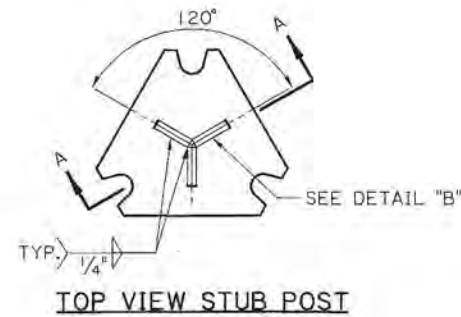
DETAIL B

☒ = VARIES

MAX SIGN AREA = 40 SQFT.

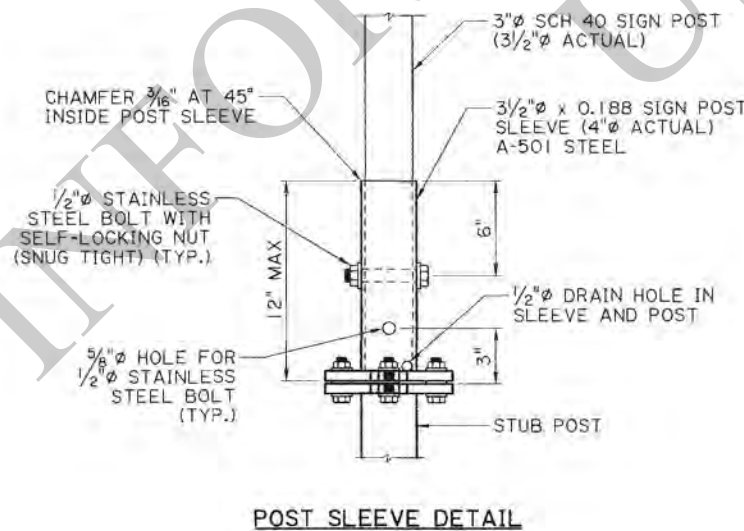
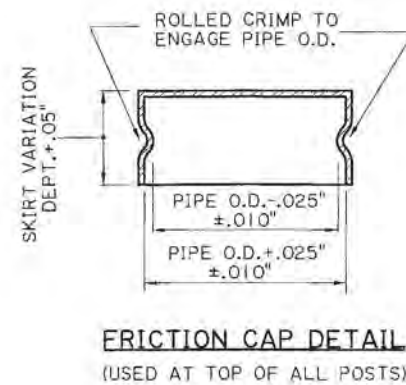


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LOUISIANA DEPARTMENT OF
TRANSPORTATION & DEVELOPMENT
BRIDGE AND
STRUCTURAL
DESIGN



STEEL MULTI-DIRECTIONAL BASE CONNECTION DATA																
NOMINAL PIPE SIZE FOR POST SLEEVE	BOLT SIZE & TORQUE	WELD SIZE	T	A	B	C	D	E	F	G	K	L	M	N	U	
3/2" SCH 40	5/8" T-226	3/8"	5/8"	7"	3 1/2"	1 3/4"	1 1/4"	3"	2 5/16"	2"	10 3/8"	9"	1/2"	6"	1/2"	

FOR STUB POST LENGTH & FOOTING DIMENSION SEE FOOTING DETAIL.
 ◊ TORQUE IN INCH-LBS., BOLTS ARE HIGH STRENGTH



PROCEDURE FOR ASSEMBLY OF BASE CONNECTION:

SPECIAL CARE SHALL BE TAKEN TO SET THE BASE PLUMB TO AVOID EXCESSIVE SHIMMING AT THE BREAK-AWAY FEATURE AFTER FINAL INSTALLATION. EXCESSIVE SHIMMING COULD IMPAIR THE BREAK-AWAY FEATURE FOR WHICH THIS INSTALLATION WAS DESIGNED. SHIM PACKS SHOWN ON THIS DRAWING SHOULD BE SUFFICIENT TO ALLOW FOR NORMAL MISALIGNMENT.

1. BASE SHALL BE ALIGNED AND SET PLUMB BEFORE OR IMMEDIATELY AFTER POURING CONCRETE FOOTING.
2. H.S. BOLTS IN BASE PLATE SHALL BE TIGHTENED TO THE PRESCRIBED TORQUE. CARE SHALL BE TAKEN TO AVOID OVERTIGHTING.

FRICTION CAPS:

CAPS MAY BE MANUFACTURED FROM EITHER HOT ROLLED OR COLD ROLLED STEEL SHEETS. THE MINIMUM SHEET METAL THICKNESS SHALL BE 24 GAUGE. THE RIM EDGES SHALL BE REASONABLY STRAIGHT AND SMOOTH. CAPS SHALL BE SIZED AND FORMED IN SUCH A MANNER AS TO PRODUCE A DRIVE-ON FRICTION FIT AND HAVE NO TENDENCY TO ROCK WHEN SEATED ON THE PIPE. THE DEPTH SHALL BE SUFFICIENT TO GIVE POSITIVE PROTECTION AGAINST ENTRANCE OF RAINWATER. THEY SHALL BE FREE OF SHARP CREASES OR INDENTATIONS AND SHOW NO EVIDENCE OF METAL FRACTURE. CAPS SHALL HAVE A ELECTRODEPOSITED COATING OF ZINC IN ACCORDANCE WITH THE REQUIREMENTS OF A.S.T.M. SPECIFICATION B633 SC4, TYPE 1.

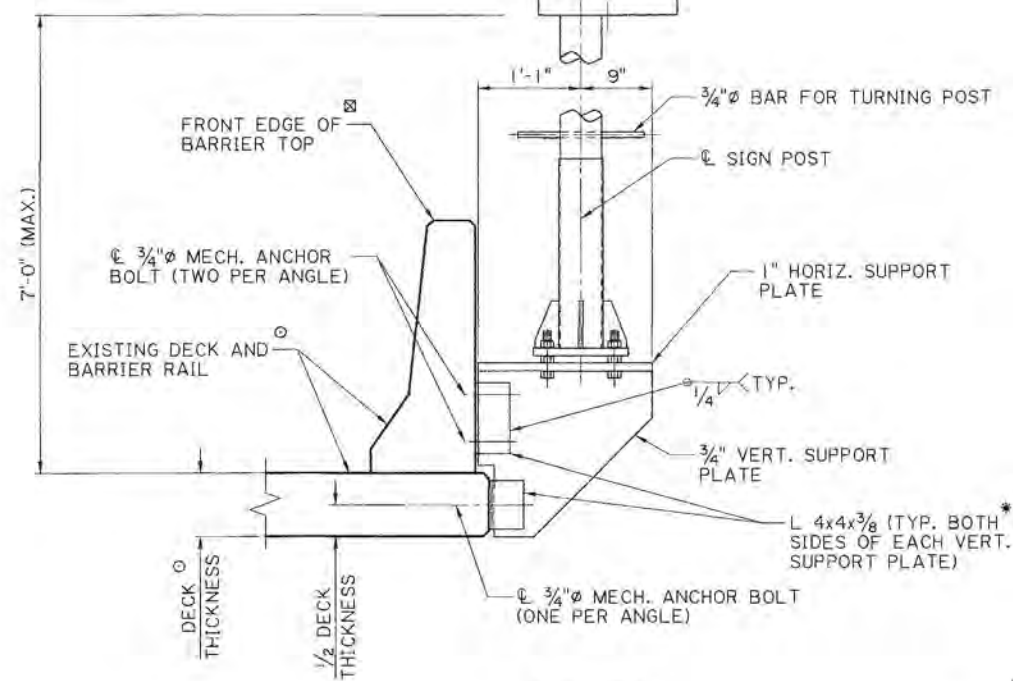
GALVANIZING:

ALL STEEL POST, PLATE, AND SLEEVE MEMBERS SHALL BE GALVANIZED PER ASTM A-123.

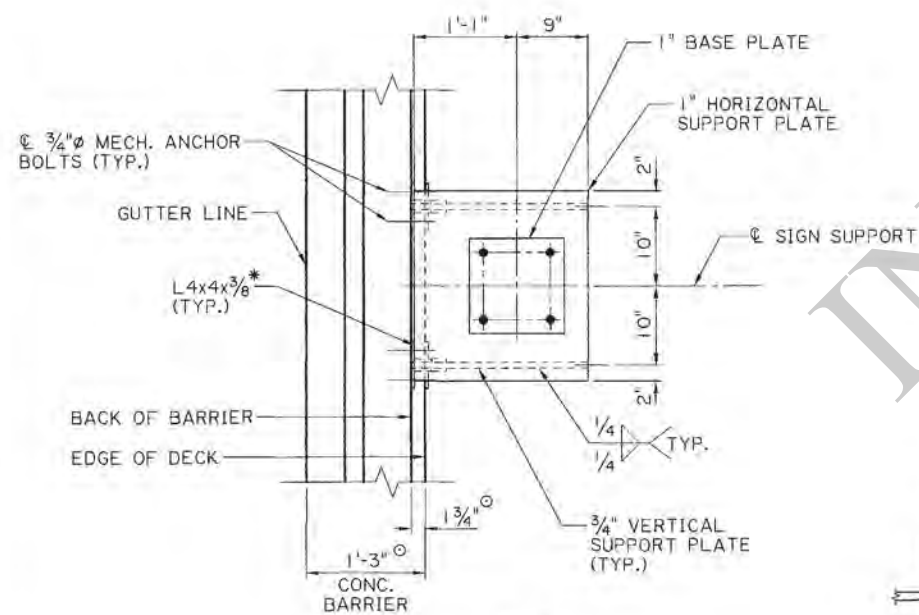
ALL MISC. HARDWARE (EXCEPT FOR STAINLESS STEEL BOLTS) SHALL BE GALVANIZED PER ASTM A-153.

SHEET NUMBER		PART		CONTROL SECTION		STATE PROJECT	
DESIGN	K. BRAUNER	CHECK	C. GUIDRY	DETAIL	K. BRAUNER	CHECK	C. GUIDRY
REVIEW	C. BOURGEOIS	SERIES # 15 OF 17					
APPROVED BY CHIEF ENGINEER: DATE: 7/1/2022							
CONTRAFLOW SIGNS (GROUND MOUNTED)							
ROADSIDE SIGNING STANDARDS							
STANDARD PLAN							
BRIDGE AND STRUCTURAL DESIGN							

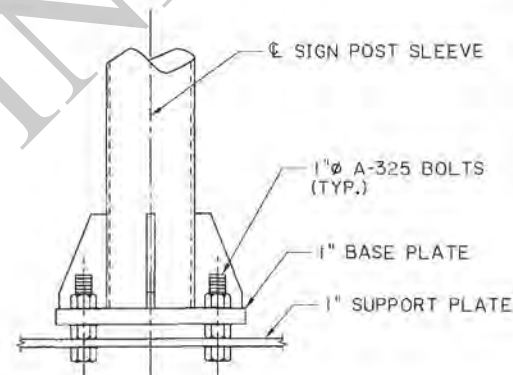
☒ SIGN MAY BE OFFSET FROM THE CENTERLINE OF POST, REGARDLESS OF ITS ORIENTATION, NO PART OF THE SIGN SHALL EXTEND BEYOND THE FRONT EDGE OF THE TOP OF BARRIER RAIL. COST OF OFFSET SIGN ATTACHMENT SHALL BE PAID FOR UNDER 729-08-00210 "MOUNTING (3/2" SIZE POST) (STRUCTURE MOUNT)".



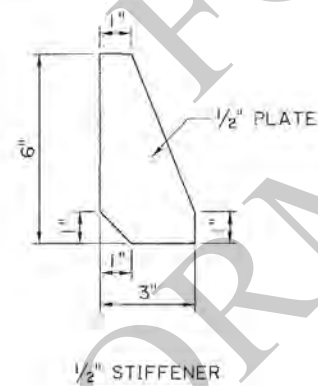
ELEVATION



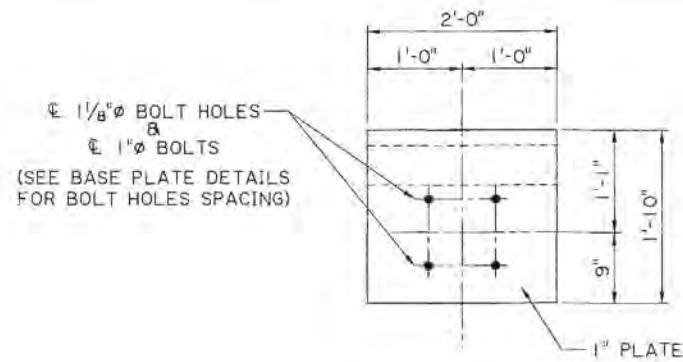
PLAN



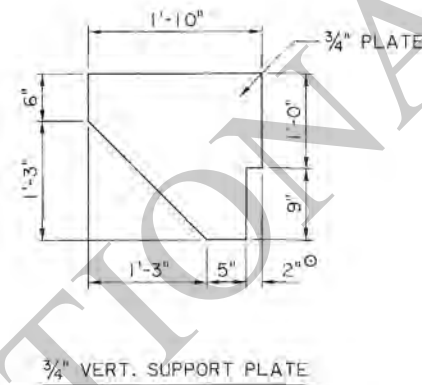
1" BOLT DETAIL



1/2" STIFFENER

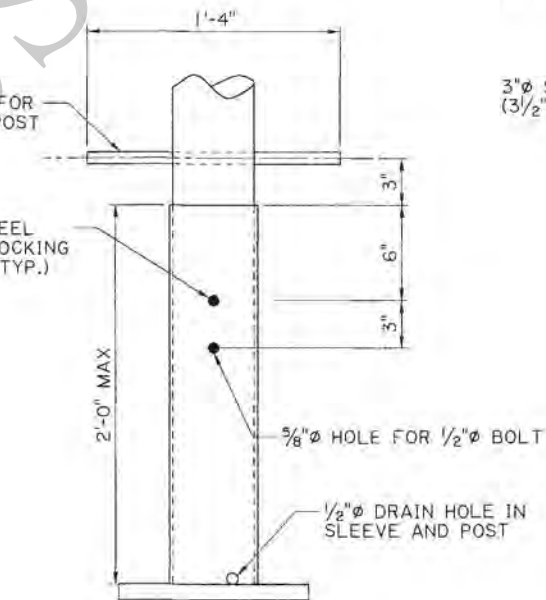


1" HORIZ. SUPPORT PLATE



3/4" VERT. SUPPORT PLATE

1/2" STAINLESS STEEL BOLT WITH SELF LOCKING NUT (SNUG TIGHT) (TYP.)

3/8" BOLT DETAIL
(STIFFENERS NOT SHOWN FOR CLARITY)

NOTES:

STRUCTURAL MEMBERS SHALL BE AASHTO M270 GRADE 50 STEEL AND SHALL BE HOT DIPPED GALVANIZED PER ASTM A-123. ALL MISC. HARDWARE (EXCEPT STAINLESS STEEL BOLTS) SHALL BE GALVANIZED AS PER ASTM A-153.

☐ ALL EXISTING DIMENSIONS ARE TO BE VERIFIED BY THE CONTRACTOR PRIOR TO FABRICATION. ANY ADJUSTMENTS TO SUPPORT BRACKET DIMENSIONS SHALL BE APPROVED BY THE ENGINEER.

* EQUIVALENT BENT PLATES MAY BE USED. ADJUST ANGLE OF BEND AS NEEDED TO ATTACH TO BARRIER RAIL.

PAYMENT FOR THE TYPE "A" SIGN POST AND SUPPORT BRACKET SHALL BE UNDER ITEM NO. 729-08-00210, "MOUNTING (3/2" SIZE POST) (STRUCTURE MOUNT)".

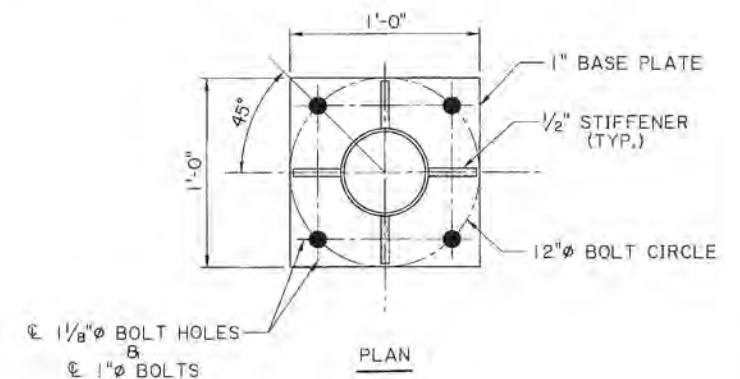
MECHANICAL ANCHOR BOLTS SHALL BE 3/4" STAINLESS STEEL (MIN. F_y = 55 ksi) AND SHALL BE SELECTED FROM THE A.M.L. AND INSTALLED AS PER THE MANUFACTURER'S RECOMMENDATIONS. EACH ANCHOR SHALL HAVE AN ALLOWABLE CAPACITY OF 3 KIPS PULLOUT AND 3 KIPS SHEAR AFTER APPLICATION OF ANY REDUCTION FACTORS FOR ANCHOR SPACING AND EDGE DISTANCE.

A 1/8" NEOPRENE PAD SHALL BE USED BETWEEN ALL STEEL AND CONCRETE CONTACT SURFACES.

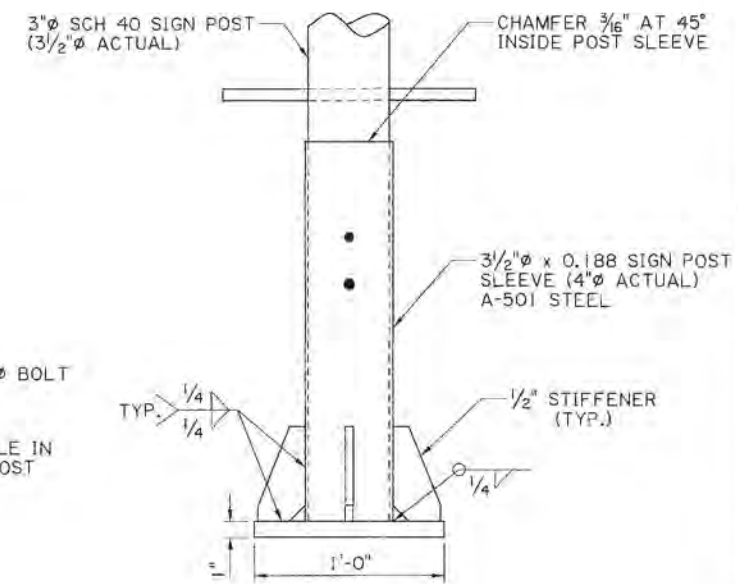
ANY PORTIONS OF THE EXISTING BARRIER THAT ARE DAMAGED SHALL BE REPAIRED TO THE SATISFACTION OF THE PROJECT ENGINEER.

REGARDLESS OF ITS ORIENTATION, NO PART OF ANY SIGN SHALL EXTEND BEYOND THE FRONT EDGE OF THE TOP OF BARRIER RAIL. DIMENSIONS OF SUPPORT POST AND BRACKET SHALL BE ADJUSTED AS NEEDED PRIOR TO FABRICATION.

MAXIMUM ALLOWABLE SIGN AREA = 20 SQ. FT.



PLAN



ELEVATION

1" BASE PLATE & SIGN
POST SLEEVE DETAILS

SHEET NUMBER		FARISH		CONTROL SECTION		STATE PROJECT	
DESIGN	K. BRAUNER	CHECK	C. GUIDRY	DETAIL	K. BRAUNER	CHECK	C. GUIDRY
REVIEW	C. BOURGEOIS	SERIES # 16 OF 17					

KURT M. BRAUNER
License No. 32667
PROFESSIONAL ENGINEER
IN
CIVIL ENGINEERING

7/1/2022

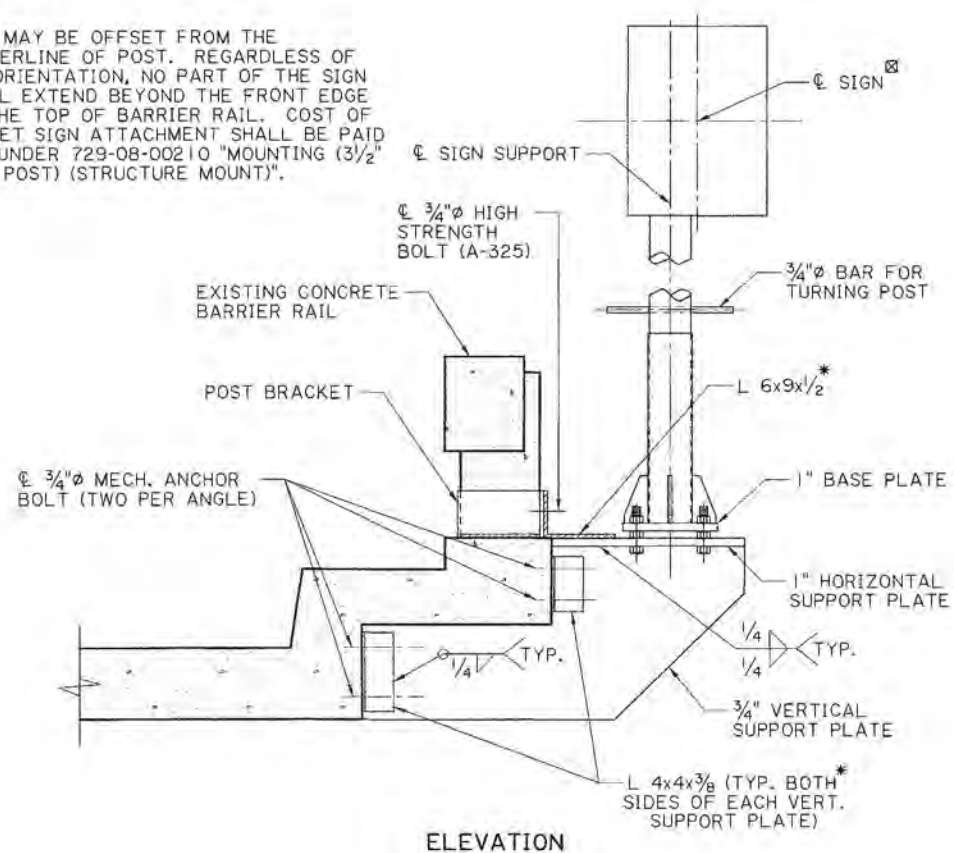
STATE OF LOUISIANA

CONTRAFLOW SIGNS
(F - SHAPE BARRIER)

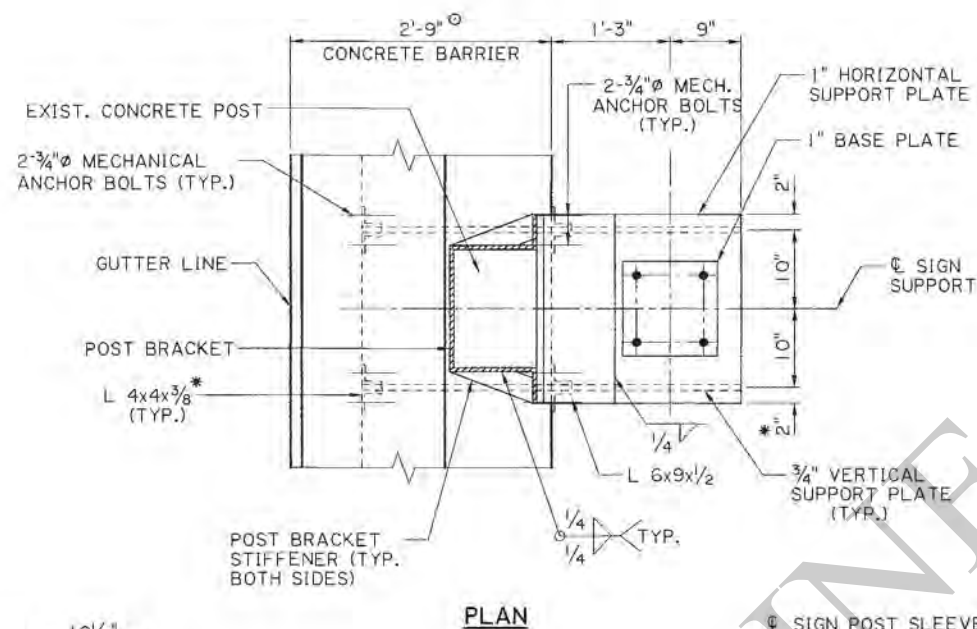
ROADSIDE SIGNING STANDARDS

BRIDGE AND
STRUCTURAL
DESIGN

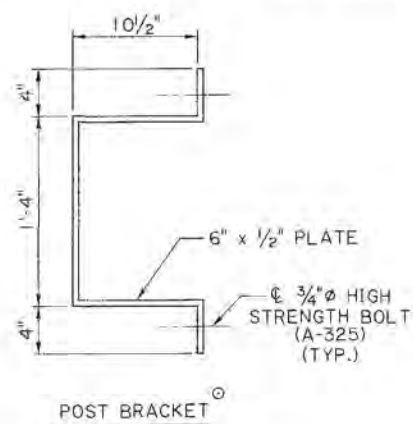
⊗ SIGN MAY BE OFFSET FROM THE CENTERLINE OF POST. REGARDLESS OF ITS ORIENTATION, NO PART OF THE SIGN SHALL EXTEND BEYOND THE FRONT EDGE OF THE TOP OF BARRIER RAIL. COST OF OFFSET SIGN ATTACHMENT SHALL BE PAID FOR UNDER 729-08-00210 "MOUNTING (3/2" SIZE POST) (STRUCTURE MOUNT)".



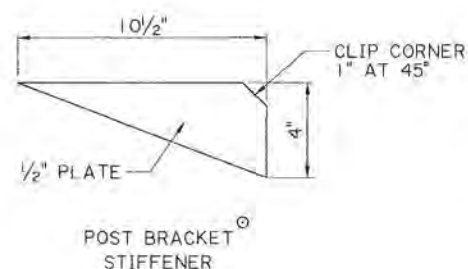
ELEVATION



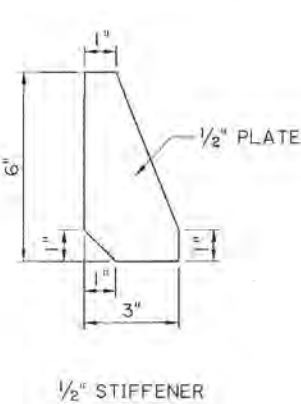
PLAN



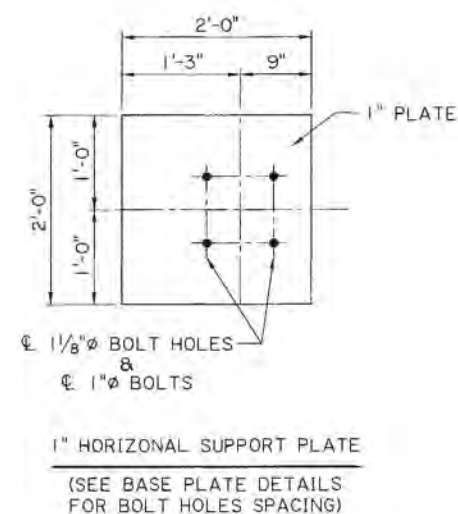
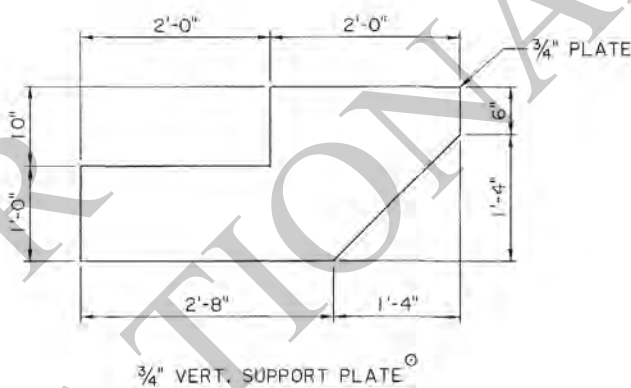
POST BRACKET



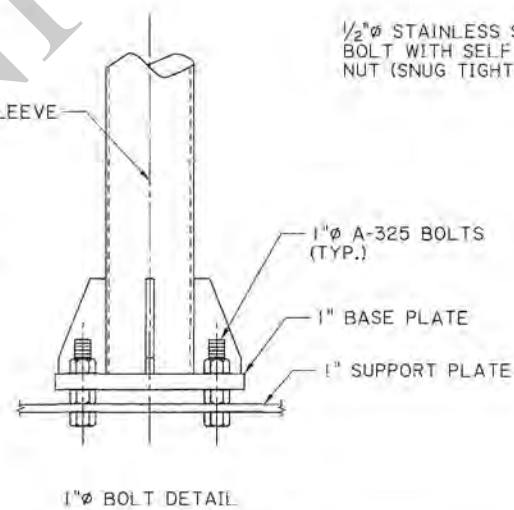
POST BRACKET STIFFENER



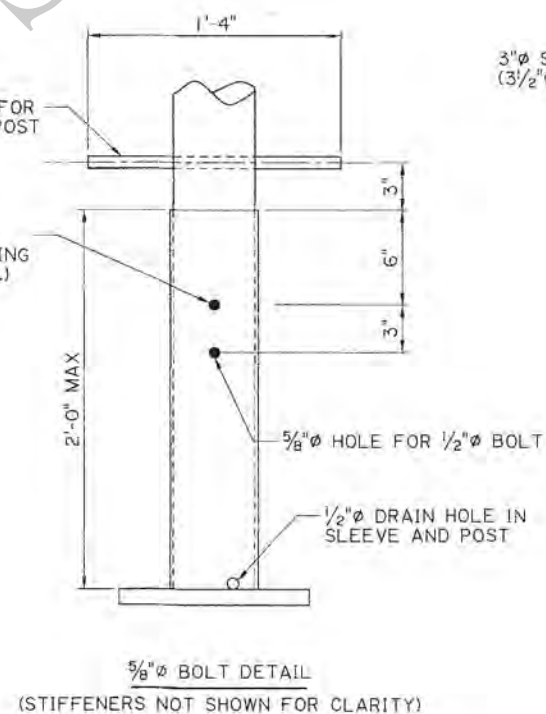
1/2" STIFFENER

1" HORIZONTAL SUPPORT PLATE
(SEE BASE PLATE DETAILS FOR BOLT HOLES SPACING)

SIGN SUPPORT BRACKET DETAILS



1" BOLT DETAIL

5/8" BOLT DETAIL
(STIFFENERS NOT SHOWN FOR CLARITY)

NOTES:

STRUCTURAL MEMBERS SHALL BE AASHTO M270 GRADE 50 STEEL AND SHALL BE HOT DIPPED GALVANIZED PER ASTM A-123. ALL MISC. HARDWARE (EXCEPT STAINLESS STEEL BOLTS) SHALL BE GALVANIZED AS PER ASTM A-153.

⊗ ALL EXISTING DIMENSIONS ARE TO BE VERIFIED BY THE CONTRACTOR PRIOR TO FABRICATION. ANY ADJUSTMENTS TO SUPPORT BRACKET DIMENSIONS SHALL BE APPROVED BY THE ENGINEER.

* EQUIVALENT BENT PLATES MAY BE USED. ADJUST ANGLE OF BEND AS NEEDED TO ATTACH TO BARRIER RAIL.

PAYMENT FOR THE TYPE "A" SIGN POST AND SUPPORT BRACKET SHALL BE UNDER ITEM NO. 729-08-00210, "MOUNTING (3/2" SIZE POST) (STRUCTURE MOUNT)".

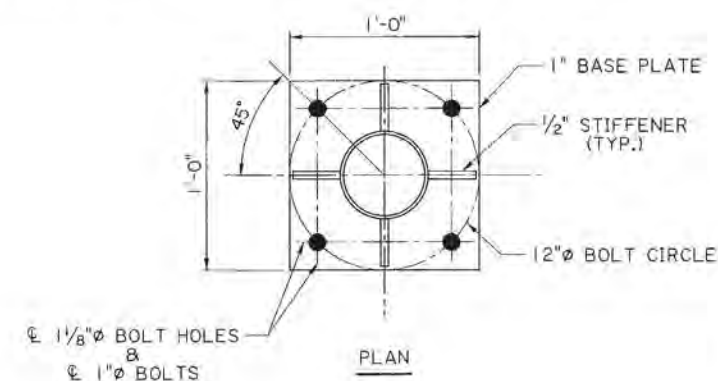
MECHANICAL ANCHOR BOLTS SHALL BE 3/4" STAINLESS STEEL (MIN. F_y = 55 ksi) AND SHALL BE SELECTED FROM THE A.M.L. AND INSTALLED AS PER THE MANUFACTURER'S RECOMMENDATIONS. EACH ANCHOR SHALL HAVE AN ALLOWABLE CAPACITY OF 3 KIPS PULLOUT AND 3 KIPS SHEAR AFTER APPLICATION OF ANY REDUCTION FACTORS FOR ANCHOR SPACING AND EDGE DISTANCE.

A 1/8" NEOPRENE PAD SHALL BE USED BETWEEN ALL STEEL AND CONCRETE CONTACT SURFACES.

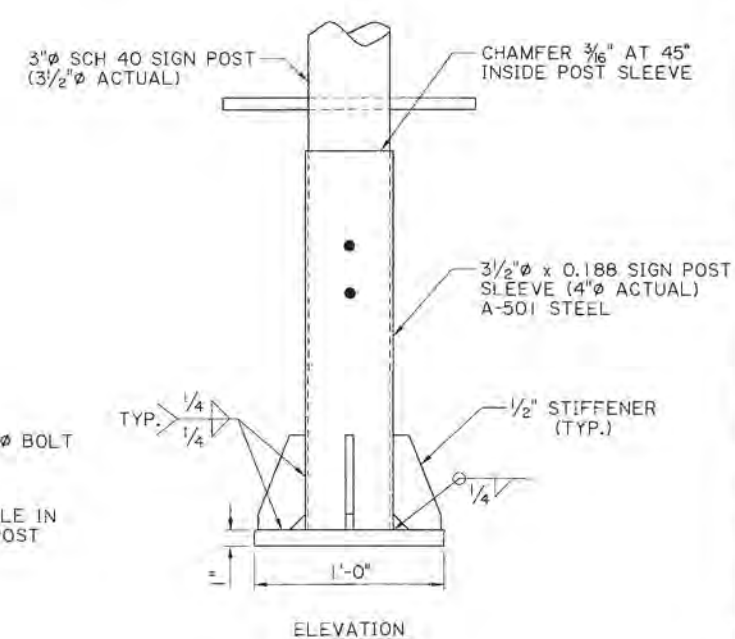
ANY PORTIONS OF THE EXISTING BARRIER THAT ARE DAMAGED SHALL BE REPAIRED TO THE SATISFACTION OF THE PROJECT ENGINEER.

REGARDLESS OF ITS ORIENTATION, NO PART OF ANY SIGN SHALL EXTEND BEYOND THE FRONT EDGE OF THE TOP OF BARRIER RAIL. DIMENSIONS OF SUPPORT POST AND BRACKET SHALL BE ADJUSTED AS NEEDED PRIOR TO FABRICATION.

MAXIMUM ALLOWABLE SIGN AREA = 20 SQ. FT.



PLAN



ELEVATION

1" BASE PLATE & SIGN POST SLEEVE DETAILS

SHEET NUMBER		DATE	
17 OF 17		7/1/2022	
DESIGN	CHECK	REVIEW	DATE
K. BRAUNER	C. GUIDRY	C. GUIDRY	7/1/2022
APPROVED BY CHIEF ENGINEER:			
CONTRAFLOW SIGNS (POST AND RAIL BARRIER)			
ROADSIDE SIGNING STANDARDS			
BRIDGE AND STRUCTURAL DESIGN			

Figure 10-10 is a detailed cross-section of a beam-column joint. It shows the reinforcement layout for Bars A and Bars B. The joint is labeled as a "CONST. JOINT". Dimensions are given in inches and feet. The column width is 6 inches. The joint width is 3 inches. The beam depth is 2 feet 0 inches. The joint depth is 10 inches. The beam width is 6 inches. The beam length is 2 feet 0 inches. The total length is 2 feet 6 inches.

Figure 10 is a sectional view of a column and beam joint. The column has a diameter of 6 inches. Bars A (#4 @ 8 inches) are in the column. Bars B (#4) are in the beam, with dimensions 2'-3 inches and 2'-9 inches shown. The joint is 3'-0 inches high and 10 inches wide. A constant joint is indicated.

Figure 10 shows the reinforcement details for a 12-in. x 12-in. column. The diagram illustrates the placement of reinforcement bars (A, B, and E) and the dimensions of the column. The column has a total height of 5'-0" and a total width of 12 inches. The reinforcement is shown in a 3D perspective view.

PLASTIC SOIL BLANKET (SUBSECTION 203.10)

3' (MAX.)

1'-0" MIN.

GEOTEXTILE FABRIC (203.11)

WALL DRAIN SEE LA DOT APPROVED MATERIALS LIST

6" Ø WEEP HOLE @ 10' MAX CTRS., MIN. 6" ABOVE FILL OVER TOE

≤ POSSIBLE SCOUR ELEV.

1'-0" MIN.

1'-6"

1'-6"

LIMITS OF STRUCTURAL EXCAVATION

LIMITS OF STRUCTURAL EXCAVATION

GRANULAR MATERIAL (1003.09)

BEDDING MATERIAL (1003.10)

6" Ø PERFORATED PIPE UNDERDRAIN

IMPERVIOUS MATERIAL (PLASTICITY INDEX ≥ 20)

WALL WITH SLOPING BACKFILL

Diagram illustrating the typical elevation of a wall panel, showing reinforcement details and dimensions:

- VARIABLE** dimensions are indicated for the top and bottom horizontal sections.
- #4 BARS B (TYP.)** are shown as vertical reinforcement bars.
- BARS TO BE CLIPPED IN FIELD AS REQUIRED** are indicated for the top reinforcement.
- 2" MIN. CLR.** (Minimum Clearance) is specified for the top reinforcement.
- CONST. JT.** (Constant Joint) is indicated for the top reinforcement.
- 8" (TYP.)** is specified for the top reinforcement spacing.
- 1'-0"** is specified for the top reinforcement length.
- BEGIN KEY 1'-0" FROM END OF WALL PANEL** is indicated for the top reinforcement.
- BARS A #4 @ 8"** are shown as horizontal reinforcement bars.
- 10"** is specified for the bottom reinforcement length.

[illegible]

WALL THICKNESS
6" OR 7"

1 1/2"
OR
2"
1/2"

2"

WALL TO FOOTING
KEY DETAIL

GRAY CAULKING *
COMPOUND

VERTICAL FACE
OF WALL (OPEN
SIDE)

CHAMFER

6" 2-BULB *
PREFORMED
WATER STOP
(1005.07)

1/2" EXP. JT.
FILLER, SEE
APPROVED

Technical drawing of a precast concrete wall joint. The drawing shows a cross-section of a wall with a vertical joint. Key components and dimensions include:

- GRAY CAULKING COMPOUND**: Indicated by an asterisk (*) at the top of the joint.
- VERTICAL OF WALL (SIDE)**: Indicated by an arrow pointing to the right side of the wall.
- CHAMFER**: A beveled edge on the top of the joint, with a dimension of $\frac{3}{4}"$.
- 6" 2-BULB**: A horizontal reinforcement bar with two bulbs, indicated by an asterisk (*).
- PREMOULDED WATER STOP**: A component at the bottom of the joint, indicated by an asterisk (*).
- Dimensions**:
 - Overall height: 6"
 - Top section height: $1\frac{1}{2}"$
 - Section below top: $2"$
 - Section below that: $1\frac{1}{2}"$
 - Section below that: $2"$
 - Section below that: $3"$
 - Section below that: $4"$
 - Section below that: $7"$
 - Section below that: $2"$

WALL TYPE	SIZE	BAR A			BAR C	BAR D	BAR E
		a	b	LENGTH	LENGTH	LENGTH	LENGTH
L2	#4	2'-5"	2'-1"	4'-6"	—	—	—
L3	#4	3'-5"	2'-4"	5'-9"	—	—	—
L4	#4	4'-5"	2'-7"	7'-0"	—	—	—
L5	#4	5'-5"	3'-1"	8'-6"	—	—	1'-6"
T4	#4	4'-5"	0'-10"	5'-3"	3'-2"	1'-3"	—
T5	#4	5'-5"	1'-1"	6'-6"	3'-8"	1'-7"	—
T6	#4	6'-5"	1'-4"	7'-9"	4'-2"	1'-7"	—

WALL TYPE	L2	L3	L4	L5	T4	T5	T6
CLASS "A1" CONCRETE (CU. YDS.)	0.077	0.140	0.167	0.211	0.191	0.249	0.287
GRADE 60 STEEL (LBS.)	9.2	11.0	13.0	18.0	22.4	25.2	28.4

The image contains two technical drawings of a roof structure. The top drawing is the **PLAN** view, showing a trapezoidal roof layout. The top edge has a total width of 2'-5" on the left and 2'-11" on the right. The bottom edge has a total width of 2'-0" on the left and 2'-6" on the right. A central horizontal dimension is labeled "VARIABLE". The right side shows a vertical height of 2'-3" and a horizontal offset of 6". The bottom drawing is a **SECTION** view, showing the roof profile across four sections: SECTION L2, SECTION L3, SECTION L4, and SECTION L. SECTION L2 has a height of 2'-0" and a width of 1'-0". SECTION L3 has a height of 3'-0" and a width of 1'-0". SECTION L4 has a height of 4'-0" and a width of 5'-0". SECTION L has a height of 5'-0" and a width of 5'-0". Arrows indicate the direction of the roof slope.

BAR A

BAR D

- * TO BE INCLUDED WITH COST OF CLASS "A1" CONCRETE.
- ⊗ TO BE INCLUDED WITH COST OF PERFORATED PIPE UNDERDRAIN.
- ☐ BACKFILL MATERIAL TO BE INCIDENTAL TO STRUCTURAL EXCAVATION IN CUT SECTION, AND TO BE PAID AS EMBANKMENT IN FILL SECTION.



TABLE I

CORRUGATED STEEL PIPE									
(2 2/3 INCH X 1/2 INCH CORRUGATION)									
PIPE DIAMETER INCHES	HEIGHT OF FILL ABOVE TOP OF PIPE IN FEET								MIN. COVER INCHES
	1-10	10.1-15	15.1-20	20.1-25	25.1-30	30.1-35	35.1-40	40.1-50	
8 OR LESS	14 (16)	14 (16)	14 (16)	14 (16)	14 (16)	14 (16)	14 (16)	14 (16)	9
10	14 (16)	14 (16)	14 (16)	14 (16)	14 (16)	14 (16)	14 (16)	14 (16)	9
12	14 (16)	14 (16)	14 (16)	14 (16)	14 (16)	14 (16)	14 (16)	14 (16)	9
15	14 (16)	14 (16)	14 (16)	14 (16)	14 (16)	14 (16)	14 (16)	14 (16)	9
18	14 (16)	14 (16)	14 (16)	14 (16)	14 (16)	14 (16)	14 (16)	14	9
21	14 (16)	14 (16)	14 (16)	14 (16)	14 (16)	14 (16)	14 (16)	14	9
24	14 (16)	14 (16)	14 (16)	14 (16)	14 (16)	14 (16)	14 (16)	12	9
30	14 (16)	14 (16)	14 (16)	14 (16)	14 (16)	14	12	8	9
36	14 (16)	14 (16)	14 (16)	14 (16)	14	14	10	--	9
42	14 (16)	14 (16)	14 (16)	14 (16)	14	14	12	--	9
48	14 (16)	14 (16)	14 (16)	14 (16)	14	14	12	--	9
54	14	14	14	14	14	12	12	--	9
60	12	12	12	12	12	12	12	--	9
66	10	10	10	10	10	10	10	--	9
72	10	10	10	10	10	10	10	--	9
78	8	8	8	8	8	8	--	--	9
84	8	8	8	8	8	8	--	--	9

TABLE 2

CORRUGATED STEEL PIPE									
(5 INCH X 1 INCH CORRUGATION AND 3 INCH X 1 INCH CORRUGATION)									
PIPE DIAMETER INCHES	HEIGHT OF FILL ABOVE TOP OF PIPE IN FEET								MIN. COVER INCHES
	1-10	10.1-15	15.1-20	20.1-25	25.1-30	30.1-35	35.1-40	41.1-50	
36	14 (16)	14 (16)	14 (16)	14 (16)	14 (16)	14 (16)	14 (16)	14	9
42	14 (16)	14 (16)	14 (16)	14 (16)	14 (16)	14 (16)	14 (16)	14	9
48	14 (16)	14 (16)	14 (16)	14 (16)	14 (16)	14 (16)	14	12	9
54	14 (16)	14 (16)	14 (16)	14 (16)	14 (16)	14	12	12	9
60	14 (16)	14 (16)	14 (16)	14 (16)	14	14	12	10	9
66	14 (16)	14 (16)	14 (16)	14 (16)	14	12	12	8	9
72	14 (16)	14 (16)	14 (16)	14	12	12	12	--	9
78	14 (16)	14 (16)	14 (16)	14	12	12	12	--	9
84	14 (16)	14 (16)	14 (16)	14	12	12	10	--	9
90	14 (16)	14 (16)	14	12	12	12	10	--	12
96	14	14	14	12	12	10	8	--	12
102	14	14	14	12	12	10	8	--	12
108	12	12	12	12	10	8	--	--	12
114	12	12	12	12	10	8	--	--	12
120	12	12	12	12	10	8	--	--	12
126	10	10	10	10	10	--	--	--	12
132	10	10	10	10	8	--	--	--	12
138	10	10	10	10	8	--	--	--	12
144	8	8	8	8	--	--	--	--	12

TABLE 3

CORRUGATED STEEL PIPE ARCH				
(5 INCH X 1 INCH CORRUGATION AND 3 INCH X 1 INCH CORRUGATION)				
EQUIV. PIPE DIAMETER INCHES	C.M. PIPE ARCH SPAN X RISE INCHES	HEIGHT OF FILL ABOVE TOP OF ARCH (FEET)		MIN. COVER INCHES
		1-4	4.1-9	
36	40 X 31	14 (16)	14 (16)	9
42	46 X 36	14 (16)	14 (16)	9
48	53 X 41	14 (16)	14 (16)	9
54	60 X 46	14 (16)	14 (16)	9
60	66 X 51	14 (16)	14 (16)	9
66	73 X 55	14	14	9
72	81 X 59	14	14	9
78	87 X 63	14	14	9
84	95 X 67	14	14	9
90	103 X 71	12	12	12
96	112 X 75	12	12	12
102	117 X 79	12	12	12
108	128 X 83	10	10	12
114	137 X 87	10	10	12
120	142 X 91	8	8	12

TABLE 5

CORRUGATED ALUMINUM PIPE (2 2/3 INCH X 1/2 INCH CORRUGATION)									
PIPE DIAMETER INCHES	HEIGHT OF FILL ABOVE TOP OF PIPE IN FEET								MIN. COVER INCHES
	1-10	10.1-15	15.1-20	20.1-25	25.1-30	30.1-35	35.1-40	40.1-50	
8 OR LESS	14 (16)	14 (16)	14 (16)	14 (16)	14 (16)	14 (16)	14 (16)	14 (16)	9
10	14 (16)	14 (16)	14 (16)	14 (16)	14 (16)	14 (16)	14 (16)	14 (16)	9
12	14 (16)	14 (16)	14 (16)	14 (16)	14 (16)	14 (16)	14 (16)	12	9
15	14 (16)	14 (16)	14 (16)	14 (16)	14 (16)	14	12	12	9
18	14 (16)	14 (16)	14 (16)	14 (16)	14 (16)	12	12	12	9
21	14 (16)	14 (16)	14 (16)	14 (16)	12	12	12	--	9
24	14 (16)	14 (16)	14	12	12	12	10	--	9
30	14 (16)	14 (16)	12	12	12	--	--	--	9
36	14	14	12	12	--	--	--	--	9
42	14	14	14	14	12	12	12	--	9
48	14	14	12	12	12	12	10	--	9
54	12	12	12	12	12	12	--	--	9
60	10	10	10	10	10	--	--	--	9
66	10	10	10	10	10	--	--	--	9
72	8	8	8	8	--	--	--	--	9

TABLE 6

CORRUGATED ALUMINUM PIPE									
(3 INCH X 1 INCH CORRUGATION)									
PIPE DIAMETER INCHES	HEIGHT OF FILL ABOVE TOP OF PIPE IN FEET								MIN. COVER INCHES
	1-10	10.1-15	15.1-20	20.1-25	25.1-30	30.1-35	35.1-40	40.1-50	
36	14 (16)	14 (16)	14 (16)	14 (16)	14 (16)	14	14	14	9
42	14 (16)	14 (16)	14 (16)	14 (16)	14	14	14	10	9
48	14 (16)	14 (16)	14 (16)	14	14	14	14	8	9
54	14 (16)	14 (16)	14	14	14	14	12	--	9
60	14 (16)	14 (16)	14	14	14	14	12	--	9
66	14 (16)	14 (16)	14	14	14	12	12	--	9
72	14	14	14	14	12	12	12	--	9
78	14	14	14	14	12	12	12	--	9
84	12	12	12	12	12	12	10	--	9
90	12	12	12	12	12	12	10	--	12
96	12	12	12	12	12	10	8	--	12
102	10	10	10	10	10	10	8	--	12
108	10	10	10	10	10	10	--	--	12
114	8	8	8	8	8	8	--	--	12
120	8	8	8	8	8	8	--	--	12

TABLE 4

CORRUGATED STEEL PIPE ARCH (2 2/3 INCH X 1/2 INCH CORRUGATION)				
EQUIV. PIPE DIAMETER INCHES	C.M. PIPE ARCH SPAN X RISE INCHES	HEIGHT OF FILL ABOVE TOP OF ARCH (FEET)		MIN. COVER INCHES
		1-4	4.1-9	
15	17 X 13	14 (16)	14 (16)	9
18	21 X 15	14 (16)	14 (16)	9
21	24 X 18	14 (16)	14 (16)	9
24	28 X 20	14 (16)	14 (16)	9
30	35 X 24	14 (16)	14 (16)	9
36	42 X 29	14 (16)	14 (16)	9
42	49 X 33	14	14	9
48	57 X 38	12	12	9
54	64 X 43	12	12	9
60	71 X 47	10	10	9
66	77 X 52	8	8	9
72	83 X 57	8	8	9

TABLE 7

CORRUGATED ALUMINUM PIPE (6 INCH X 1 INCH CORRUGATION)									
PIPE DIAMETER INCHES	HEIGHT OF FILL ABOVE TOP OF PIPE IN FEET								MIN. COVER INCHES
	1-10	10.1-15	15.1-20	20.1-25	25.1-30	30.1-35	35.1-40	40.1-50	
30	14 (16)	14 (16)	14 (16)	14 (16)	14	14	12	12	9
36	14 (16)	14 (16)	14 (16)	14	14	14	12	10	9
42	14 (16)	14 (16)	14 (16)	14	14	12	12	10	9
48	14 (16)	14 (16)	14 (16)	14	12	12	10	--	9
54	14 (16)	14 (16)	14 (16)	12	12	10	8	--	9
60	14 (16)	14 (16)	14 (16)	12	10	10	8	--	9
66	14 (16)	14 (16)	14	12	10	8	--	--	9
72	12	12	12	10	8	--	--	--	9
84	10	10	10	10	--	--	--	--	9
96	8	8	8	8	--	--	--	--	12

TABLE 8

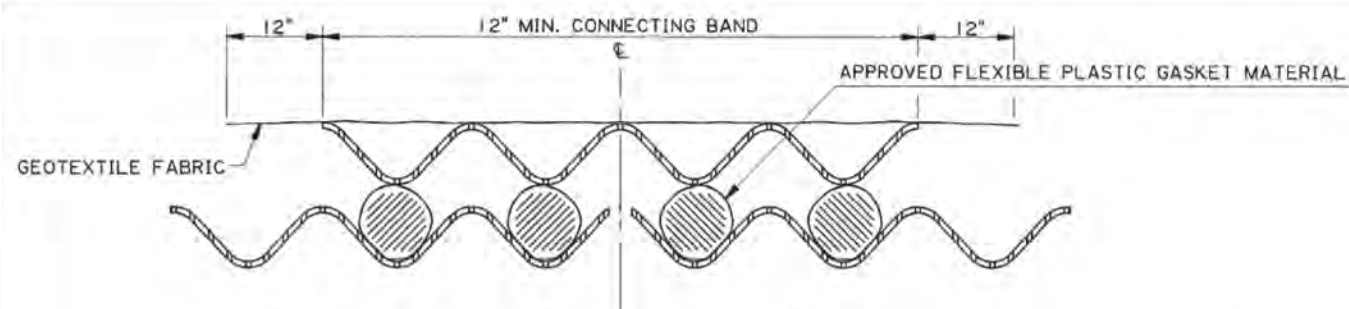
CORRUGATED ALUMINUM PIPE ARCH (2 2/3 INCH X 1/2 INCH CORRUGATION)				
EQUIV. PIPE DIAMETER INCHES	C.A. PIPE ARCH SPAN X RISE INCHES	HEIGHT OF FILL ABOVE TOP OF ARCH (FEET)		MIN. COVER INCHES
		1-4	4.1-9	
15	17 X 13	14 (16)	14 (16)	9
18	21 X 15	14 (16)	14 (16)	9
21	24 X 18	14 (16)	14 (16)	9
24	28 X 20	14 (16)	14 (16)	9
30	35 X 24	14	14	9
36	42 X 29	14	14	9
42	49 X 33	12	12	9
48	57 X 38	10	10	9
54	64 X 43	10	10	9
60	71 X 47	8	8	9
66	77 X 52	8	8	9

GENERAL NOTES

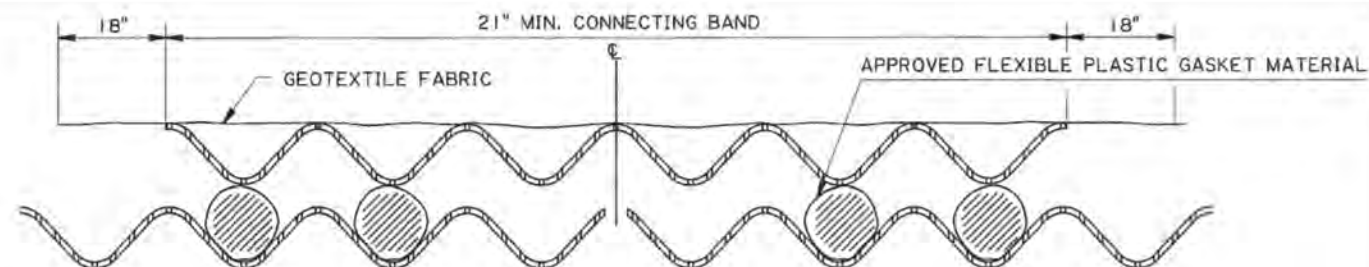
- 1) MINIMUM PIPE WALL THICKNESS AND COATING REQUIREMENTS FOR ALL METAL PIPE WILL BE AS SHOWN ON THE PROJECT PLANS UNDER " SUMMARY OF DRAINAGE STRUCTURES ".
- 2) JOINT TYPES FOR ALL CIRCULAR AND ARCH METAL PIPE SHALL CONFORM TO CURRENT LA DOTD STANDARD SPECIFICATIONS AND SHALL BE AS SHOWN ON THE SUMMARY OF DRAINAGE STRUCTURE PLAN SHEETS.

GAGE NO.	16	14	12	10	8	
THICKNESS (IN.)	0.060	0.075	0.105	0.135	0.164	ALUMINUM
	0.064	0.079	0.109	0.138	0.168	GALVANIZED STEEL

- 3) PIPE WALL THICKNESS SHOWN ON PROJECT PLANS MAY VARY FROM PIPE WALL THICKNESS SHOWN IN TABLES DUE TO LOCAL PH, RESISTIVITY AND ABRASIVE CONDITIONS.
- 4) MINIMUM COVER IS MEASURED FROM TOP OF PIPE TO THE TOP OF THE SUBGRADE. MINIMUM COVER SHOWN IS ADEQUATE FOR H-20 LOADING WHEN PAVEMENT IS IN PLACE. DURING CONSTRUCTION, WHEN HEAVY LOADS MAY BE DRIVEN OVER OR CLOSE TO BURIED STRUCTURE, IT IS THE CONTRACTOR'S RESPONSIBILITY TO PROVIDE THE ADDITIONAL COVER NEEDED TO PROTECT THE PIPE.
- 5) MAXIMUM FILL HEIGHT IS MEASURED FROM TOP OF PIPE TO TOP OF SURFACING.
- 6) SEE STANDARD SPECIFICATIONS AND STANDARD PLAN BM-01 FOR DETAILS OF BACKFILL PROCEDURES. SPECIAL CARE SHOULD BE TAKEN TO THOROUGHLY COMPACT BACKFILL UNDER PIPE HAUNCHES.
- 7) FOR CIRCULAR PIPE, THE AVERAGE INSIDE DIAMETER SHALL NOT VARY MORE THAN 1% OR $1/2"$, WHICHEVER IS GREATER, FROM THE NOMINAL DIAMETER.
- 8) FOR ARCH PIPE, A TOLERANCE OF $1" \pm$ OR 2% OF EQUIVALENT CIRCULAR DIAMETER, WHICHEVER IS GREATER, WILL BE PERMISSIBLE IN SPAN AND RISE.
- 9) GAGES SHOWN IN PARENTHESES MEET AASHTO REQUIREMENTS AND ARE THE GAGE WHICH WOULD NORMALLY BE USED, THE HEAVIER GAGES (NOT IN PARENTHESES) SHOULD BE USED ON DOTD PROJECTS.



FOR PIPES LESS THAN OR EQUAL TO 36" ROUND OR EQUIVALENT ARCH

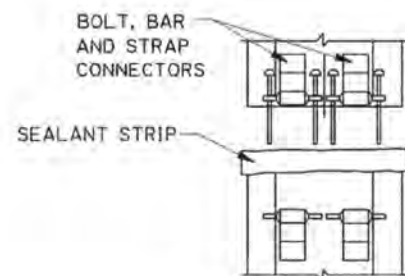


FOR PIPES GREATER THAN 36" ROUND OR EQUIVALENT ARCH
AND FOR ALL SIZES OF 6 X 1 AND 5 X 1 CORRUGATIONS

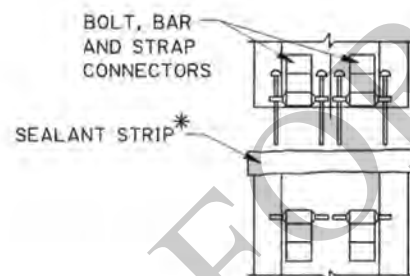
METHOD OF SEALING ANNULAR JOINT AT CONNECTING BAND WHERE TWO PIPE SECTIONS ARE JOINED

FLEXIBLE PLASTIC GASKET SYSTEM

T2 & T3 JOINTS AS SHOWN (WITH RODS & LUGS).
T1 JOINT SIMILAR, EXCEPT REQUIRES ONLY ONE STRIP
OF PLASTIC GASKET MATERIAL IN SECOND CORRUGATION
EACH SIDE OF JOINT.

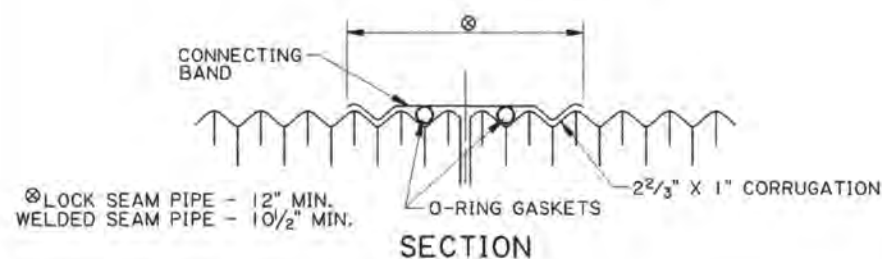


CONNECTION DETAIL DOUBLE HARNESS



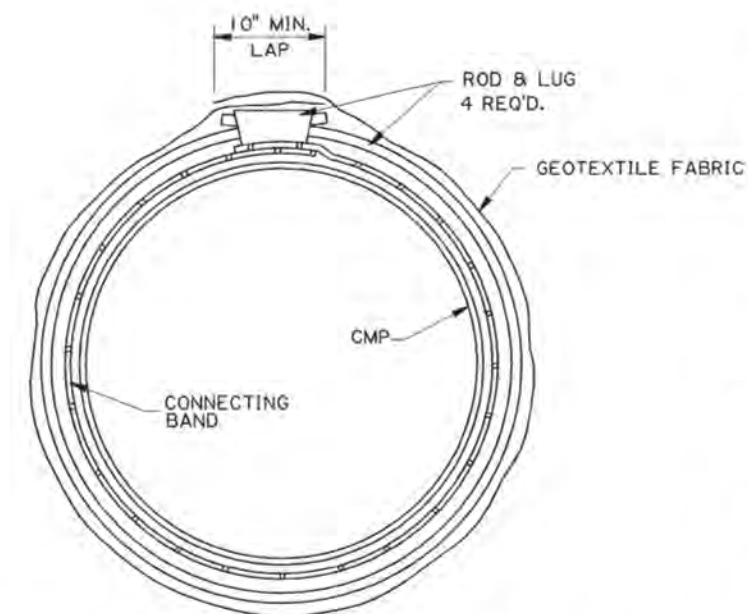
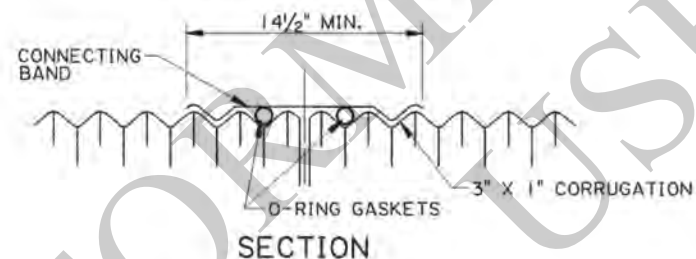
CONNECTION DETAIL DOUBLE HARNESS

* BAND LAP SEALANT TO BE FLEXIBLE PLASTIC GASKET MATERIAL. REQUIRED THICKNESS IN TABLE. REQUIRED WIDTH IS BAND WIDTH PLUS 2".

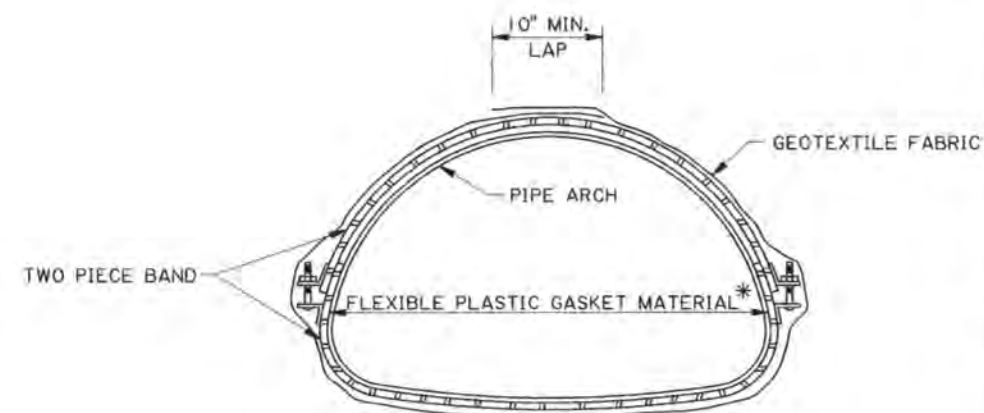


ALTERNATE CONNECTING BANDS O-RING SYSTEM

GEOTEXTILE FABRIC CLOTH REQUIRED - SAME AS SHOWN ABOVE.



CONNECTING BAND WITH ROD & LUG (FLEXIBLE PLASTIC GASKET SYSTEM)

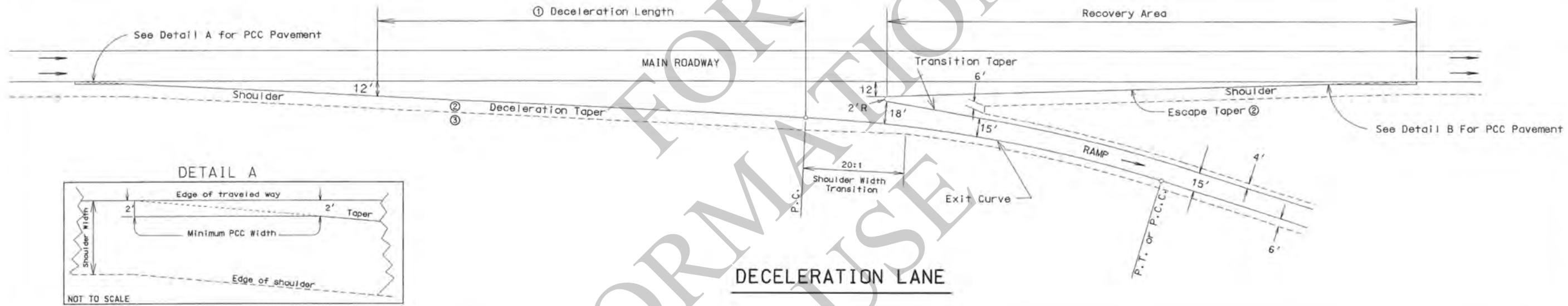
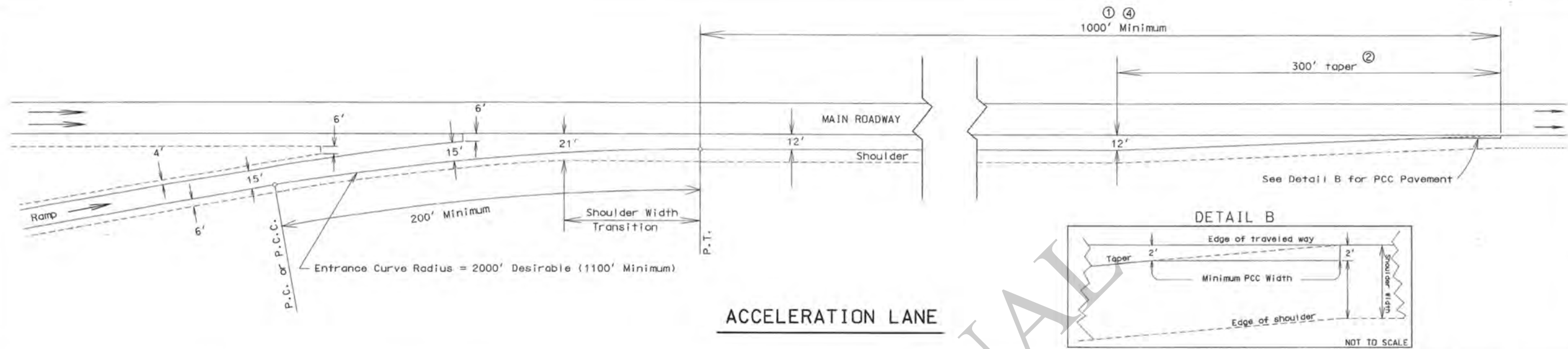


METHOD OF SEALING LONGITUDINAL JOINTS AT TWO PIECE CONNECTING BAND (FLEXIBLE PLASTIC GASKET SYSTEM)

O-RING AND FLEXIBLE GASKET THICKNESS			
PIPE SIZE	CORRUGATION DEPTH	O-RING THICKNESS	FLEXIBLE GASKET THICKNESS
36" & UNDER	1/2"	13/16"	1"
LARGER THAN 36"	1/2"	7/8"	1"
ALL SIZES	1"	1 3/8"	1 1/2"

GENERAL NOTES:

- 1) O-RING GASKETS WILL BE REQUIRED WHENEVER O-RING SYSTEM CONNECTING BANDS ARE USED. O-RING GASKETS SHALL BE IDENTIFIED BY SIZE, DIAMETER, BATCH OR REEL NUMBER AND PLANT.
- 2) HELICAL ENDS SHALL BE RE-ROLLED AS PER CURRENT LA DOTD STANDARD SPECIFICATIONS.
- 3) FOR O-RING JOINT SYSTEMS, BOLTS SHALL BE TORQUED TO A MINIMUM OF 40 FT.LBS.
- 4) FOR FLEXIBLE PLASTIC GASKET SYSTEM ROUND PIPE, A MINIMUM OF 4 GALVANIZED 1/2" DIAMETER STEEL RODS AND LUGS SHALL BE PLACED OVER THE CONNECTING BAND. RODS MAY BE 2 PIECE FOR PIPE LARGER THAN 48".
- 5) GEOTEXTILE FABRIC SHALL CONFORM TO CURRENT LA DOTD STANDARD SPECIFICATIONS.
- 6) ARCH PIPE SHALL USE THE FLEXIBLE PLASTIC GASKET SYSTEM WITH APPROVED ANGLES OR STRAPS.
- 7) ALL GASKET MATERIAL SHALL BE APPROVED PRODUCTS ON CURRENT LA DOTD QUALIFIED PRODUCTS LIST.
- 8) PIPE JOINTS TO BE IN ACCORDANCE WITH CURRENT LA DOTD STANDARD SPECIFICATIONS.



SPECIFIC NOTES:

- ① Length of speed change lanes and recovery area to be increased if grades are equal to or exceed 3%. See Exhibit 10-71 from the 2004 AASHTO book entitled "A Policy On Geometric Design Of Highways And Streets".
- ② On curved mainline roadways with flat curvature, use a horizontal curve to approximate the taper rate. See Exhibit 10-74 from the 2004 AASHTO entitled "A Policy on Geometric Design of Highways and Streets".
- ③ Horizontal curves are used instead of deceleration tapers when a lane is dropped. Lane drop escape tapers must be 50:1 to 70:1.
- ④ 1200' minimum if the ramp and freeway will frequently carry traffic volumes approximately equal to the design capacity of the merging area.

GENERAL NOTES:

- 1 - Minimum ramp length for diagonal ramps is 1000' measured from physical gore to crossroad and 1200' minimum for ramps near capacity.
- 2 - A minimum 200' platform along the ramp is required so the ramp vertical alignment approximates the mainline alignment. The platform is measured from the physical nose.
- 3 - Refer to Exhibit 3-27 from the 2004 AASHTO book entitled "A Policy on Geometric Design of Highways and Streets" for ramp superelevation rates.
- 4 - The mainline design speed should not be less than the anticipated operating speed.
- 5 - Where decision sight distance cannot be provided at exits, contact the Design Development Engineer for guidance.
- 6 - The minimum entrance/exit curve radii must be increased if the mainline cross-slope is less than 2.5%. The maximum cross slope break from mainline to ramp curve must not exceed 5%.

Minimum Conditions Table

Condition	Design Speeds (mph)				Deceleration Length (ft)	Exit Curve Radius (ft)	Escape Taper Rate	Transition Taper Rate	Deceleration Taper Rate
	Mainline	Ramp Gore	Ramp Proper						
			Loop	Diagonal					
A	70	50	25	50 min	340	1050	35:1	25:1	20:1
B	60	45 *	25	45 min	300	850	30:1	22.5:1	17:1
C	50	35	25	35 min	285	500	25:1	17.5:1	14:1

* Rounded upward

SHEET NUMBER

DATE

DESIGNED BY

CHECKED BY

APPROVED BY

DATE: 11-21-05

REVISION DESCRIPTION

W. Al-Tajer

STANDARD PLAN SC-01

TYPICAL SPEED CHANGE LANES FOR INTERSTATE HIGHWAYS

DESIGN DEVELOPMENT

GNL NK111

GNL NK111

SEPT 2005

1 OF 1

DATE

DESIGNED BY

CHECKED BY

APPROVED BY

DATE: 11-21-05

REVISION DESCRIPTION

W. Al-Tajer

STANDARD PLAN SC-01

TYPICAL SPEED CHANGE LANES FOR INTERSTATE HIGHWAYS

DESIGN DEVELOPMENT

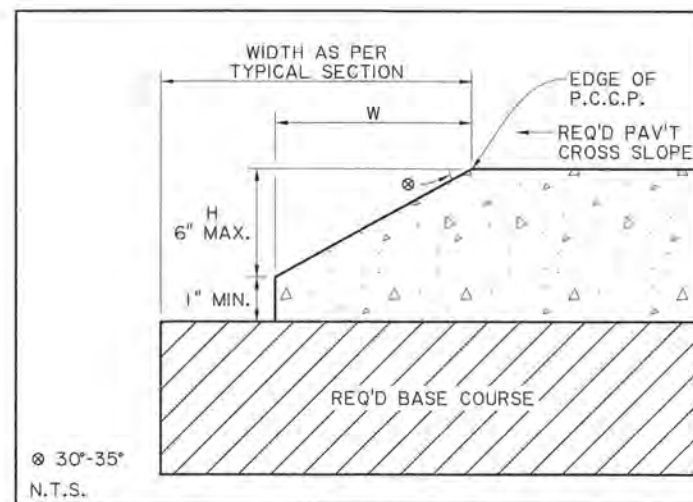
GNL NK111

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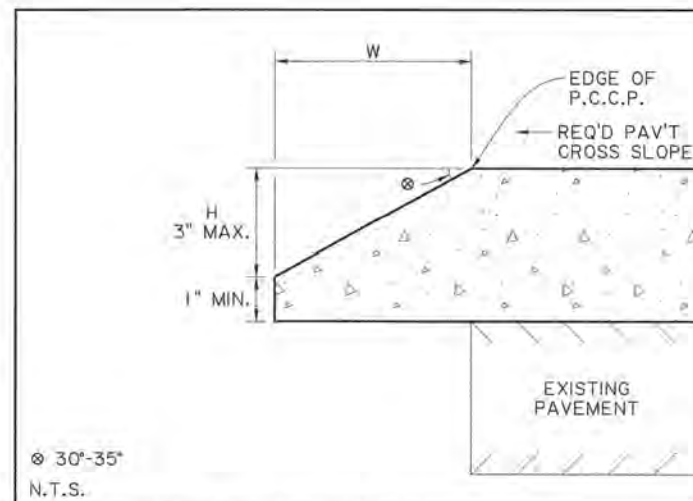
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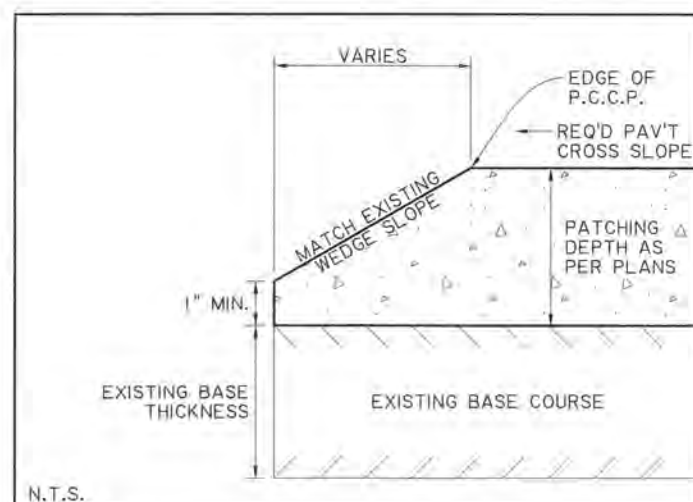
P.C.C.P. SHOULDER WEDGE



P.C.C. SHOULDER WEDGE FOR NEW CONSTRUCTION



P.C.C. SHOULDER WEDGE FOR WHITETOPPING



P.C.C. SHOULDER WEDGE FOR PAVEMENT PATCHING WITH EXISTING WEDGE

NOTES:

- SHOULDER WEDGES SHALL BE REQUIRED AT THE OUTSIDE EDGES OF THE PAVED ROADWAY (EDGE OF TRAVEL LANE OR EDGE OF PAVED SHOULDER), UNLESS THE TOTAL REQUIRED ASPHALT CONCRETE THICKNESS IS LESS THAN 2" AND FOR PAVEMENT PATCHING PROJECTS WHERE THE EXISTING PAVEMENT DOES NOT HAVE SHOULDER WEDGES.
- FOR ASPHALT CONCRETE PAVEMENTS, SHOULDER WEDGES SHALL BE UTILIZED ON SINGLE LIFTS IF THE LAYER THICKNESS IS GREATER THAN OR EQUAL TO 2" AND, AT A MINIMUM, ON EACH OF THE TOP 2 LIFTS OF A MULTI-LIFT PAVEMENT.
- EQUIP THE PAVER WITH A MECHANICAL DEVICE THAT WILL PRODUCE A WEDGE WITH A UNIFORM TEXTURE, SHAPE, AND DENSITY, WHILE AUTOMATICALLY ADJUSTING TO VARYING HEIGHTS ENCOUNTERED ALONG THE PAVEMENT EDGE.
- THE CONTRACTOR SHALL BLADE AND SHAPE EXISTING GROUND OR SHOULDER MATERIAL TO FORM A UNIFORM SURFACE UNDER THE ASPHALT SHOULDER WEDGE PRIOR TO PLACEMENT OF PAVEMENT.
- FOR ASPHALT CONCRETE PAVEMENTS, THE MAXIMUM SHOULDER WEDGE HEIGHT ("H") SHALL EQUAL 6". IF THE TOTAL ASPHALT THICKNESS IS GREATER THAN 6", THE CONTRACTOR SHALL STAGE CONSTRUCTION BY PULLING UP THE SHOULDERS OR FORE SLOPE MATERIAL IN THE LOWER LIFTS, THEN UTILIZING THE WEDGE IN EACH OF THE FINAL 2 LIFTS.
- REQUIRED BASE WIDTHS ARE AS SHOWN ON TYPICAL SECTIONS. IT IS NOT REQUIRED FOR THE BASE COURSE WIDTH TO INCLUDE THE WIDTH OF THE ASPHALT WEDGE. THE ASPHALT WEDGE MAY BE SUPPORTED BY THE EXISTING GROUND, EMBANKMENT, OR SHOULDER MATERIAL. HOWEVER, THE DESIGNER SHOULD MAKE EVERY EFFORT TO SUPPORT THE SHOULDER WEDGE WITH NEW BASE COURSE MATERIAL UNLESS PREVENTED BY PROJECT SCOPE, PHYSICAL RESTRAINTS, OR DEEMED IMPRACTICAL. FOR CONCRETE SHOULDER WEDGES, THE REQUIRED BASE WIDTH SHOULD INCLUDE THE WIDTH OF THE SHOULDER WEDGE AND THE DESIRED ADDITIONAL WIDTH BEYOND THE SURFACING, EXCEPT FOR WHITETOPPING.
- SEE TYPICAL SECTION SHEETS FOR PAVEMENT DETAILS.
- THE ANGLE SHOWN FOR AN ASPHALT CONCRETE SHOULDER WEDGE IS MEASURED AFTER COMPACTION.
- THE SHOULDER WEDGE SHALL NOT BE CONSIDERED PART OF THE REQUIRED PAVEMENT WIDTH.
- ANGLE OF SHOULDER WEDGE IS MEASURED FROM THE FACE OF THE WEDGE TO A LINE REPRESENTING THE THEORETICAL PROJECTION OF THE PAVEMENT CROSS SLOPE.
- SHOULDER WEDGES SHALL NOT BE CONSTRUCTED AT INTERSECTIONS, PAVED DRIVEWAYS, OR BEHIND GUARDRAILS UNLESS OTHERWISE NOTED IN THE PLANS OR DIRECTED BY THE PROJECT ENGINEER. IF SHOULDER WEDGES ARE CONSTRUCTED AT THESE LOCATIONS DURING PAVING OPERATIONS, THEY SHALL BE REMOVED BY SAWCUTTING AT NO DIRECT PAY. NO QUANTITY DEDUCTIONS WILL BE MADE IN THE PLANS FOR SUCH GAPS.
- SHOULDER WEDGES SHALL BE REQUIRED AT THE OUTSIDE EDGES OF WHITETOPPING UNLESS THE REQUIRED THICKNESS IS 2" OR AN ASPHALT SHOULDER IS PROPOSED IN ADDITION TO WHITETOPPING. THE PROPOSED ASPHALT SHOULDER IS REQUIRED TO HAVE WEDGES UNLESS THE TOTAL REQUIRED ASPHALT CONCRETE THICKNESS IS LESS THAN 2".

P.C.C.P. SHOULDER WEDGE QUANTITIES

HEIGHT "H" INCHES	30° WEDGES		35° WEDGES	
	WIDTH "W" INCHES	SQYD PER MILE	WIDTH "W" INCHES	SQYD PER MILE
4.0	6.9	674.7	5.7	557.3
5.0	8.7	850.7	7.1	694.2
6.0	10.4	1016.9	8.6	840.9

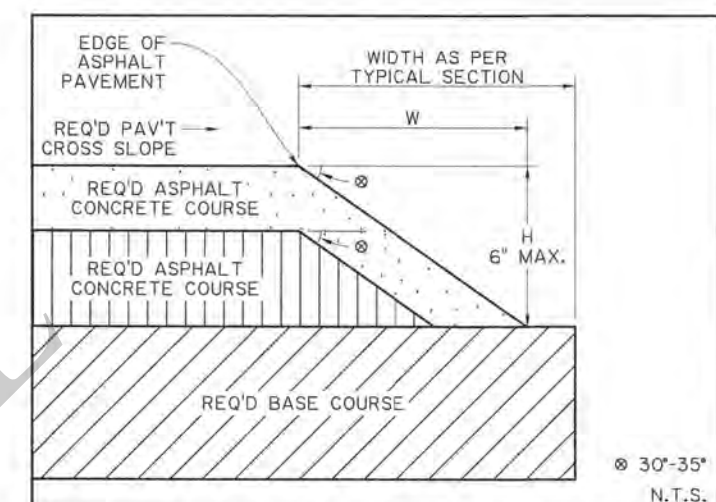
QUANTITIES SHOWN IN PLANS ARE BASED ON A 35° WEDGE
QUANTITIES SHOWN ARE FOR 2 WEDGES (ONE AT EACH SIDE OF ROADWAY)

WHITETOPPING WEDGE QUANTITIES

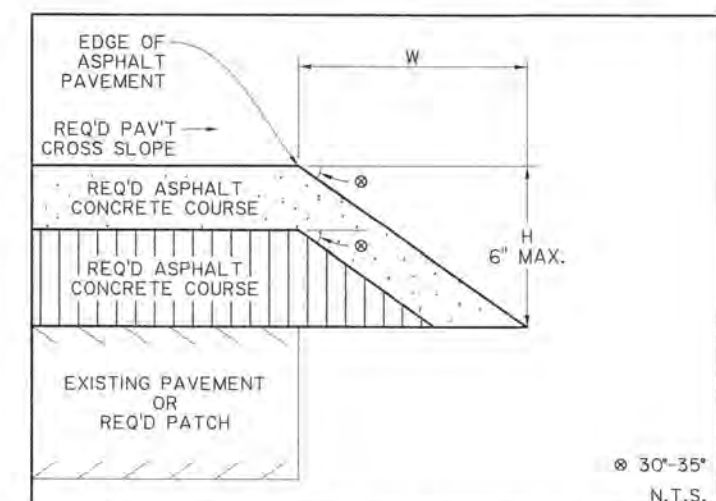
HEIGHT "H" INCHES	30° WEDGES		35° WEDGES	
	WIDTH "W" INCHES	SQYD PER MILE	WIDTH "W" INCHES	SQYD PER MILE
2.0	3.5	342.2	2.9	283.6
3.0	5.2	508.4	4.3	420.4

QUANTITIES SHOWN IN PLANS ARE BASED ON A 35° WEDGE
QUANTITIES SHOWN ARE FOR 2 WEDGES (ONE AT EACH SIDE OF ROADWAY)

ASPHALT CONCRETE SHOULDER WEDGE



ASPHALT CONCRETE SHOULDER WEDGE FOR NEW CONSTRUCTION OR BASE REHABILITATION



ASPHALT CONCRETE SHOULDER WEDGE FOR OVERLAY OR PATCHING

ASPHALT CONCRETE SHOULDER WEDGE QUANTITIES

HEIGHT "H" INCHES	30° WEDGES		35° WEDGES	
	WIDTH "W" INCHES	TONS PER MILE	WIDTH "W" INCHES	TONS PER MILE
2.0	3.5	18.8	2.9	15.6
2.5	4.3	28.9	3.6	24.2
3.0	5.2	41.9	4.3	34.7
3.5	6.1	57.4	5.0	47.1
4.0	6.9	74.2	5.7	61.3
4.5	7.8	94.4	6.4	77.4
5.0	8.7	117.0	7.1	95.5
5.5	9.5	140.5	7.9	116.8
6.0	10.4	167.8	8.6	138.7

QUANTITIES SHOWN IN PLANS ARE BASED ON A 35° WEDGE
QUANTITIES SHOWN IN TABLE ARE BASED ON 110 IN SQYD
QUANTITIES SHOWN ARE FOR 2 WEDGES (ONE AT EACH SIDE OF ROADWAY)

SHEET NUMBER

DATE

DESIGN

CHECK

REVIEW

SERIES

1 OF 1

10/24/2022

STATE OF LOUISIANA

RYAN A. NOLAN

License No. 40078

PROFESSIONAL ENGINEER

IN

ROAD DESIGN

APPROVED BY CHIEF ENGINEER

DATE

10/25/2022

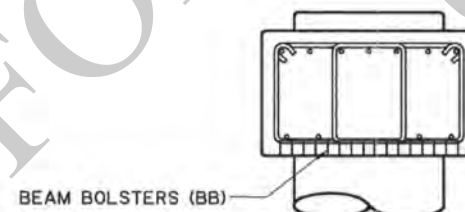
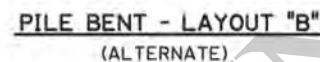
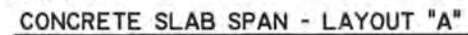
SHOULDER WEDGE

SW-01

DOTD

LOUISIANA DEPARTMENT OF TRANSPORTATION & DEVELOPMENT

ROAD DESIGN



COLUMN BENT



STEEL WIRE BAR SUPPORTS AND REINFORCING STEEL BARS SHALL BE IN ACCORDANCE WITH THE LATEST APPROVED LOUISIANA STANDARD SPECIFICATIONS FOR ROADS AND BRIDGES, AS AMENDED BY THE SPECIAL PROVISIONS AND/OR SUPPLEMENTAL SPECIFICATIONS.

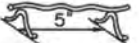
HEIGHT OF BAR SUPPORTS ARE TO BE THAT REQUIRED TO SUPPORT THE REINFORCING BARS AT POSITIONS SHOWN IN THE PLANS.
BAR SUPPORTS ARE NOT INTENDED, AND SHALL NOT BE USED, TO SUPPORT RUNWAYS FOR CONCRETE BUGGIES OR SIMILAR LOADS.

WHEN BAR SUPPORTS ARE PLACED IN CONTINUOUS LINES, THEY SHALL BE SO PLACED THAT THE ENDS OF THE SUPPORTING WIRES SHALL BE LAPPED TO LOCK THE LAST LEGS ON ADJOINING PIECES, BUT NO BAR SHALL BE PLACED MORE THAN 2" BEYOND THE LAST LEG AT THE END OF A RUN OF ANY CONTINUOUS SUPPORTS,

WHERE BAR SUPPORTS ARE USED ON EARTH OR AGGREGATE SUB GRADES, SUITABLE PLATES SHALL BE PROVIDED TO PREVENT DISPLACEMENT OF THE SUPPORT FOOT. ALL BAR SUPPORTS BEARING ON THE FORMS SHALL HAVE RADIUS BEARING LEGS IN THE FORM OF A HOOK (UPTURNED LEGS) OR SPHERICAL FOOT AT THE LOWER END OF THE LEGS.

THE BOTTOM OF BAR SUPPORTS SHALL BE COATED WITH AN ACCEPTABLE EPOXY OR PLASTIC MATERIAL FOR A MINIMUM DISTANCE OF 2 INCHES FROM THE POINT OF CONTACT WITH THE FORMS.

METAL TIE WIRES AND BAR SUPPORTS SHALL BE COATED FULLY WITH AN ACCEPTABLE EPOXY, PLASTIC OR NYLON MATERIAL IF USING EPOXY COATED REINFORCING STEEL.

TYPE OF SUPPORT	BAR SUPPORT ILLUSTRATION	MINIMUM WIRE DIAMETER Δ			REMARKS
		HEIGHT	TOP	LEGS	
SLAB BOLSTER (SB)		ALL	NO. 4 CORRU- GATED	NO. 6	VERTICAL CORRUGATIONS SPACED 1" ON CENTERS
BEAM BOLSTER (BB)		UP TO 2" OVER 2"	NO. 7 NO. 4	NO. 7 NO. 4	
☐ CONTINUOUS HIGH CHAIR (CHC)		2" TO 5" 5" TO 9" OVER 9"	NO. 2 NO. 2 NO. 2	NO. 4 NO. 2 NO. 0	LAYOUT "A" FOR SPANS
● INDIVIDUAL HIGH CHAIR (HC)		2" TO 5" 5" TO 9" OVER 9"	N/A N/A N/A	NO. 4 NO. 2 NO. 0	LAYOUT "B" FOR SPANS (ALTERNATE)

Δ AMERICAN STEEL AND WIRE GAUGES.

- ⦿ LEGS SHALL BE 20 DEGREES OR LESS WITH VERTICAL WHEN HEIGHT EXCEEDS 1'-0". REINFORCE LEGS WITH WELDED CROSS WIRES OR ENCIRCLING WIRES.
- ☐ LEGS SHALL BE 20 DEGREES OR LESS WITH VERTICAL, ON 8 1/4" CENTER MAXIMUM, WITHIN 4" OF END CHAIR, AND SPREAD BETWEEN LEGS NOT LESS THAN 50% OF NORMAL HEIGHT.
- * IF LONGITUDINAL REINFORCING BARS ARE NO. 4, SPACE THE INDIVIDUAL HIGH CHAIRS (HC) @ 3'-0" MAXIMUM CENTERS LONGITUDINALLY; FOR NO. 5 BARS OR LARGER, SPACE @ 4'-0" MAXIMUM CENTERS.



GENERAL PROVISIONS

- All temporary traffic control (TTC) devices used shall be in accordance with the Louisiana Standard Specifications for Roads and Bridges, the MUTCD, and shall meet the NCHRP Report 350 or MASH requirements for Test Level 3 devices where applicable.
- Materials used for TTC shall be in accordance with the Louisiana Standard Specifications for Roads and Bridges and, when applicable, the LADOTD AML.
- Placement of TTC devices shall not commence without the approval of the Engineer and until work is about to begin, unless they are covered.
- No lane closures, lane shifts, diversions or detours shall occur without the approval of the Engineer.
- Responsibility is hereby placed upon the contractor for the installation, maintenance and operation of all TTC devices called for in these plans or required by the Engineer for the protection of the traveling public as well as all LADOTD and construction personnel.
- The contractor shall also be responsible for the maintenance of all permanent signs, pavement markings, and traffic signals left in place as essential to the safe movement and guidance of traffic within the project limits unless noted in the plans.
- The DTOE shall serve as a technical advisor to the Engineer for all traffic control matters.
- The Chief Construction Engineer or his appointed designee shall approve all signs and situations not addressed in the plans based on the recommendations of the Project Engineer and the DTOE. All changes shall be noted in all project traffic control diaries.
- The Chief Construction Engineer or his appointed designee shall approve all design speeds of diversions or shifts, if it differs from design plans, based on the recommendations of the Project Engineer and the DTOE.
- All temporary traffic control plans shall comply with the Transportation Management Plan.
- Any additional signs shown in the MUTCD and required by the Engineer shall be installed under Item 713-01-00100.
- Neither work activity nor storage of equipment, vehicles, TMAs, or materials shall occur within the buffer space.
- When a work area has been established on one side of the roadway only, there shall be no conflicting operations or parking on the opposite shoulder within 500 feet of the work area.
- ⓐ • A lighting plan shall be submitted to the Engineer 30 days prior to night work for approval. (See section 713.10 of the Louisiana Standard Specifications for Roads and Bridges.)
- ⓐ • Parking of vehicles or unattended equipment or storage of materials, within the work zone clear zone shall not be permitted unless protected by guardrail or barriers. If the work zone clear zone is not defined on the plan sheets, the Engineer shall verify.
- Immediately upon removal of existing guardrail, the contractor shall install and maintain an NCHRP Report 350 or MASH approved device to protect the blunt end of the bridge or column until new guardrail is installed. After removal of the existing guardrail, new guardrail should be installed within seven (7) days. On non-NHS routes with shoulders less than 8 feet wide: If an NCHRP 350 Report Test Level 3 or MASH device is required but the field conditions of the roadway cannot support a Test Level 3 device, then a Test Level 2 device can be substituted in its place upon approval by the Engineer. If utilized, a TMA is allowed for a maximum of 72 hours.
- ⓐ • All costs associated with temporary crash devices are to be included under the appropriate NS-700 pay item.
- Sight distance should be considered when placing traffic control devices.
- On all mainline Interstates, a minimum of 1.5 feet of paved shoulder on the left and right side shall be maintained at all times.

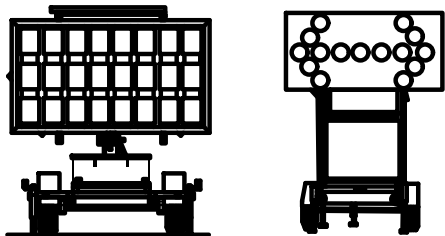
- On Interstates, a minimum of 11 foot lanes shall be maintained. On all other roadways, a 10 foot minimum travel lane should be maintained where practical.
- TTC Standards are not drawn to scale.
- The contractor shall develop an internal traffic control plan approved by the Engineer prior to each phase.
- Truck restrictions such as (but not limited to) restricting lanes, oversize loads or times of travel, may be required for narrow lanes or other field conditions.
- ⓐ • Temporary concrete barrier shall be placed on a paved surface. This paved surface should follow current design criteria used for paved embankment widening for guardrails.
- ⓐ • Flare rates for temporary concrete barriers should follow the most current guidance in the AASHTO Roadside Design Guide.

PAVEMENT MARKINGS (see AML)

- All pavement markings within the limits of the project or adjacent to the project limits that are in conflict with the project signing or the required traffic movements shall be removed from the pavement by blast cleaning or grinding. (Existing striping shall not be painted over with black paint or covered with tape.)
- If special pavement markings are needed, they shall be reflectorized, removable and accompanied by the proper signage.
- Temporary Raised Pavement Markers may be added to supplement temporary striping in areas of transition, in tapers, in diversions and in other areas of need as shown in the plans or as directed by the Engineer.
- Temporary markings installed in the permanent configuration shall comply with LADOTD pavement marking standard plans, MUTCD and/or the permanent striping plans.

PORTABLE CHANGEABLE MESSAGE SIGNS (PCMS)

- PCMS shall be used on all Interstate Highways. PCMS shall be used on all other roadways (where space is available) with an ADT greater than 20,000.
- When used in advance of a lane closure or a lane shift, the PCMS should be placed on the right hand side of the road a minimum distance of 2 miles in advance of the taper for interstates and to be determined by the Engineer on other highways.
- For interstates and multi-lane highways, if vehicles are queuing beyond the 2 mile PCMS, an additional PCMS should be placed on the right hand side of the road approximately 5 miles in advance of the taper or at the end of the queue, whichever is greater.
- ⓐ • PCMS messages shall be approved by the Engineer. Messages shall be no more than 3 lines and 2 screens.
- Messages shall display only traffic operational, regulatory, warning, and guidance information. PCMS messages shall not display advertising or safety messages. Messages should only convey information concerning the problem/situation, location, and recommended driver action.
- PCMS should be placed as far from the traveled lane as possible. They shall be shielded by guardrail or barriers. If this is not possible they shall be delineated with a min. 3 drum taper spaced at 20ft with a 4th drum alongside the PCMS.
- If the PCMS encroaches on the improved shoulder then the contractor shall install a shoulder closure.
- ⓐ • When the PCMS is not displaying a work zone appropriate message pertaining to the ongoing construction project it shall be shielded by guard rail or barriers, or removed from the work zone clear zone.



ALL TTC STANDARDS SHOW MINIMUM CONSTRUCTION SIGNING.
ALL SITUATIONS SHALL BE REVIEWED AND/OR DESIGNED BY THE ENGINEER.
CONTRACTORS ARE RESPONSIBLE FOR COMPLYING WITH ALL TTC STANDARDS.

SPEED LIMITS

- The Engineer may approve a 10 mph drop in the speed limit for posted speeds of 45 mph or greater and for any construction, maintenance or utility operation that requires one or more of the following:
 - (A) The condition of the traveled way is degraded due to milled surfaces or uneven travel lane lines greater than 1.5 inches.
 - (B) Work is in progress in the immediate vicinity of the travel way requiring lane closures or lane width reductions less than 11 feet.
 - (C) Workers present on the shoulder within 2 feet of the edge of the traveled way without barrier protection.
- The reduced speed zone shall only apply to those portions of the project limits affected. The Engineer may allow SPEED LIMIT WHEN FLASHING signs to supplement reduced speed zones.
- If the speed limit is reduced, speed limit signs shall be placed:
 - (A) beyond major intersections;
 - (B) at one mile intervals in rural areas;
 - (C) at half mile intervals in urban areas.
- At the end of the reduced speed zone, a speed limit sign displaying the original speed limit prior to construction shall be installed.
- For all other speed limit reductions not listed above, the Project Engineer and the DTOE shall recommend the speed reduction to the Chief Construction Engineer or his appointed designee for approval.
- If the speed limit is reduced more than 10 mph, placement of the signs shall be re-evaluated according to the MUTCD.

FLASHING ARROW BOARDS

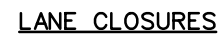
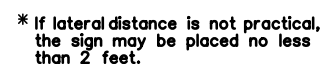
- All Flashing Arrow Boards shall be 4 feet by 8 feet and Type C.
- Flashing Arrow Boards should be placed on the shoulder. When there is no shoulder or median area, the arrow board shall be placed within the closed lane behind the channelizing devices and as close to the beginning of the taper as practical.
- Flashing arrow boards shall be delineated with retroreflective TTC devices.
- At no time shall the arrow board encroach in the traveled way. When Flashing Arrow Board signs are not being used, they shall be shielded by guard rail or barriers, or removed.
- Arrow boards shall only be used for lane reduction tapers and shall not be used for lane shifts.

ABBREVIATIONS

AASHTOAmerican Association of State Highway and Transportation Officials
ADTAverage Daily Traffic
ⓐ AGCAssociated General Contractors of America
AMLApproved Materials List
ANSIAmerican National Standards Institute
ATSSA.....American Traffic Safety Services Association
B.O.P.Beginning of Project
DTOEDistrict Traffic Operations Engineer
E.O.P.End of Project
LADOTDLouisiana Department of Transportation and Development
MASHAASHTO Manual for Assessing Safety Hardware
MUTCDManual on Uniform Traffic Control Devices
NCHRP.....National Cooperative Highway Research Program
NHSNational Highway System
PCMSPortable Changeable Message Sign
TMATruck Mounted Attenuator
TMCTraffic Management Center
TTCTemporary Traffic Control
TTC Standards ..Temporary Traffic Control Standard Plans

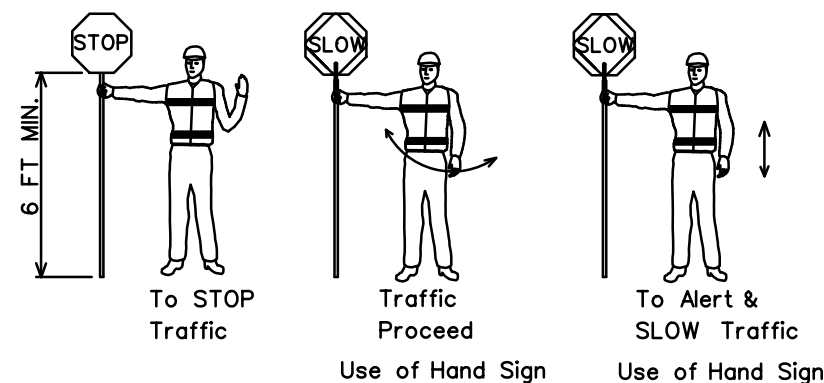
SHEET NUMBER		PARISH		CONTROL SECTION		STATE PROJECT	
DESIGN		CHECK		DETAIL		CHECK	
APPROVED BY CHIEF ENGINEER		DATE		DATE		DATE	
BRB		BY		BRB		BY	
BARRIER INFORMATION AND MINOR CORRECTIONS		REVISION OR CHANGE ORDER DESCRIPTION		4-3-24		DATE	
NO.		DATE		NO.		DATE	
TEMPORARY TRAFFIC CONTROL GENERAL NOTES SHEET		TTC-00 (A)		DOTD		LOUISIANA DEPARTMENT OF TRANSPORTATION & DEVELOPMENT	
TRAFFIC ENGINEERING							

- All signs used for temporary traffic control shall follow the plans, the LADOTD TTC Standards and the MUTCD.
- Signs shown in the TTC illustrations are typical and may vary with each specific condition.
- One Type B High Intensity light shall be used to supplement the first sign (or pair of signs) that gives warning about a lane closure during nighttime operations (See AML).
- Mesh rollup signs shall not be allowed on any project.
- Contractor shall use caution not to damage existing signs which remain in place. Any LADOTD signs damaged by work operations shall be replaced by the contractor under item 713-01-00100.
- All signs (permanent and temporary) shall be removed or completely covered with a strong, lightweight, opaque material when no longer applicable. (Burlap is not an acceptable material to cover signs).
- At no time shall signs warning against a particular operation be left in place once the operation has been completed or where the condition has been removed.
- Warning signs used for temporary traffic controls shall meet the following guidelines unless otherwise noted in the plans:
 - (A) size shall be 48 inches by 48 inches.
 - (B) see the Louisiana Standard Specifications for Roads and Bridges and the AML for sheeting information.
 - (C) lateral distance of signs shall be a minimum of 6 feet from the edge of shoulder or edge of pavement if no shoulder exists and 2 feet from the back of curb in urban areas (see diagram).
- When portable sign frames are not in use, they shall be moved to an area inaccessible to traffic and not visible to the driver.
- Left side mounted signs will not be required for roadways with a center left turn lane and for undivided roadways.
- Vinyl rollup signs and 1 foot portable sign stands may be used if work zone is in place for 3 days or less. Signs or stands may not be used if there are more than 2 lanes in each direction and if signs do not meet all size, color, retroreflectivity and NCHRP 350 Report or MASH requirements.
- All signs shall be visible to the drivers (i.e. no obstructions such as on street parking or other traffic control devices shall block the sign).
- On divided highways, signs shall be placed on the right and the left as shown on the TTC standards.
- Sign posts:
 - Signs measuring 10 square feet or less shall be mounted on 1 rigid post
 - Signs over 10 square feet shall be mounted on 2 rigid posts
 - Signs over 20 square feet shall be mounted on at least 3 rigid posts
- Rigid sign supports shall be driven to a minimum depth of 3 feet. (If splicing is required, see Allowable Lap Splice U-channel Post.)
- For sign height, see the Rural and Urban diagrams:



- All proposed lane, road or shoulder closures shall be reviewed by the DTOE and approved by the Engineer.
- Two lane, two-way highways shall have a maximum work area of two miles; all other roadways shall have a four mile maximum work area.
- A queue analysis shall be performed prior to approval of lane closures on all Interstates according to Section 6A.1 of the Traffic Engineering Manual.
- Closure plans and times shall be turned in to the Engineer for review according to the following:
 - (A) 5 working days minimum if traffic control plan has been approved or is contained in the plans.
 - (B) 10 working days minimum and a traffic control plan must be submitted for lane closures not addressed in the plans.
- Weekly updates to the DTOE, Project Engineer, the LADOTD TMC operator and the regional TMC operator (if applicable) will be required for all ongoing lane closures to update the closure status.
- Daily updates to the DTOE, Project Engineer and TMC operator (if applicable) will be required for all projects where active closures are in place.

- All flaggers shall be qualified.
- The contractor shall be responsible for training or assuring that all flaggers are qualified to perform flagging duties.
- A Qualified Flagger is one that has completed courses such as those offered by ATSSA or other courses approved by the LADOTD Work Zone Task Force. The contractor shall be responsible for getting the flagger course approved.
- When utilized, a flagger shall use a minimum 18 inch octagonal shape sign on a minimum 6 foot stop/slow paddle and wear ANSI Class 2 Lime Green vest during day time operations and ANSI Class 3 Lime Green ensemble during night operations.
- In all flagging operations, the flagger must be visible from the flagger advance warning sign.
- Flaggers shall not be used on the Interstate.



- If the TTC zone affects the movement of pedestrians, adequate pedestrian access and walkways shall be provided either through the TTC zone or a designated alternate route.
- Pedestrians should be provided with a convenient and accessible path that replicates as nearly as practical the most desirable characteristics of the existing sidewalk(s) or footpath(s).
- Advance notification of sidewalk closures shall be provided by the maintaining agency.
- ☐ • No storage of construction materials, equipment, and/or vehicles will be permitted on permanent or temporary bicycle, pedestrian, or transit facilities for any duration of time.

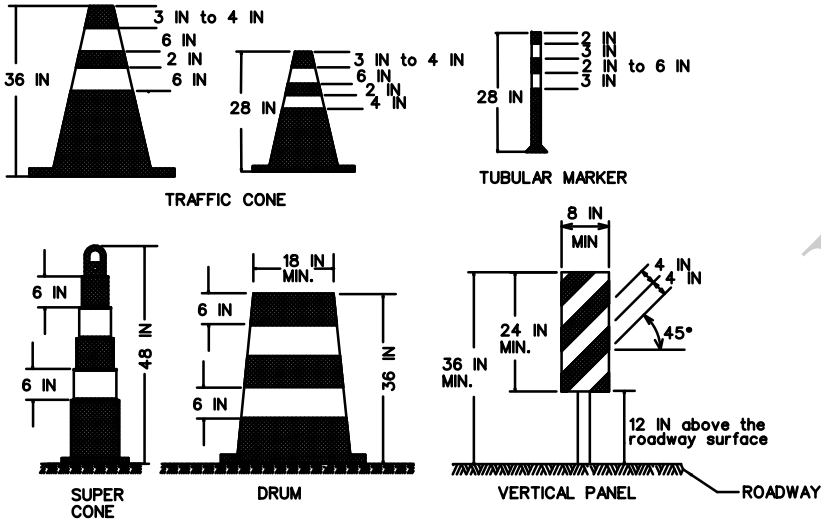
- The contractor shall be responsible for understanding all rules and requirements in the current edition of the following documents:

- 1) Louisiana Standard Specifications for Roads and Bridges. http://www.dotd.la.gov/Inside_LaDOTD/Divisions/Engineering/Standard_Specifications
- 2) Manual on Uniform Traffic Control Devices for Streets and Highways (MUTCD). <http://mutcd.fhwa.dot.gov/>
- 3) LADOTD Approved Materials List (AML) Manual. http://wwwsp.dotd.la.gov/Inside_LaDOTD/Divisions/Engineering/Materials_Lab/Pages/Menu_QPL.aspx
- 4) LADOTD Traffic Engineering Manual http://wwwsp.dotd.la.gov/Inside_LaDOTD/Divisions/Engineering/Traffic_Engineering/Misc%20Documents/Traffic%20Engineering%20Manual.pdf
- 5) National Cooperative Highway Research Program (NCHRP) Report 350: "Guidelines for Work Zones Traffic Control Devices". http://onlinepubs.trb.org/Onlinepubs/nchrp/nchrp_rpt_350-a.pdf
- 6) NCHRP Report 475: "A Procedure for Assessing and Planning Nighttime Highway Construction and Maintenance". http://onlinepubs.trb.org/Onlinepubs/nchrp/nchrp_rpt_475.pdf
- 7) NCHRP Report 476: "Guidelines for Design and Operation of Nighttime Traffic Control for Highway Maintenance". http://onlinepubs.trb.org/Onlinepubs/nchrp/nchrp_rpt_476.pdf
- 8) NCHRP Report 498: "Illumination Guidelines for Nighttime Highway Work". http://onlinepubs.trb.org/Onlinepubs/nchrp/nchrp_rpt_498.pdf
- 9) American Association of State Highway and Transportation Officials (AASHTO) Roadside Design Guide.
- 10) American Traffic Safety Services Association (ATSSA) Quality Guidelines for Work Zone Traffic Control Devices and Features.
- 11) U.S. Department of Transportation Federal Highway Administration Traffic Control Handbook for Mobile Operations at Night. <http://www.dot.state.il.us/blr/I023.pdf>

ALL TTC STANDARDS SHOW MINIMUM CONSTRUCTION SIGNING.
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CONTRACTORS ARE RESPONSIBLE FOR COMPLYING WITH ALL TTC STANDARDS.

CHANNELIZING DEVICES

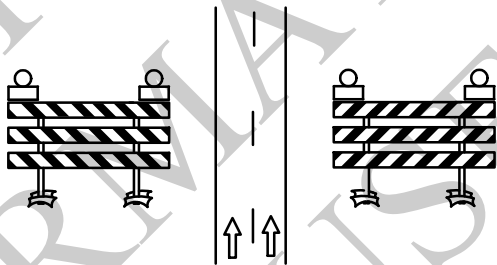
- The following devices may be used as channelizing devices:
Tubular Markers, Vertical Panels, Cones, Drums and Super Cones.
- 28 inch traffic cones are not allowed on:
 - Interstates
 - Highways with speeds greater than 40 mph.
- During nighttime operations, 28 inch and 36 inch cones are not allowed.
- Retroreflective material pattern used on super cones shall match that used on drums.
- Tangent Areas:**
 - Standard Spacing:** See Standard Device Spacing and Buffer Space table.
 - Daylight Operations:** Drums and super cones are spaced at standard spacing. All other devices are at 1/2 standard spacing.
 - Nighttime Operations:** Drums and supercones at standard spacing are the only devices allowed.
- Taper Areas:**
 - Standard Spacing:** See Standard Device Spacing and Buffer Space table.
 - Daylight Operations:** Drums are spaced at standard spacing. All other devices are 1/2 standard spacing.
 - Nighttime Operations:** Drums (at standard spacing) are the only devices allowed.
- Downstream Locations & Flaggers:** Drums or supercones at 20' max spacing. The length of taper shall be between 50' - 100' with a minimum of 6 devices.
- Type C steady burn lights shall be used on all channelizing devices in the taper as well as the first two devices in the tangent at night, (see the AML).
- Typical channelizing device lateral placement (do not include when it is used as a divider for opposing directions of traffic) shall be 2 feet off the lane line in the closed lane or shoulder.
- Devices may be adjusted laterally to accommodate ongoing work in the immediate vicinity but must be returned to the closed lane after the work activity has moved.
- Channelizing devices on the lane line shall be of the same type.
- Channelizing devices in each taper shall be of the same type.



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TYPE III BARRICADES

- Only Type III Barricades shall be used in the roadway or shoulder. All barricades shall use Type 3 High Intensity Sheeting on both sides of the barricade.
- All barricades shall be a minimum of 8 feet in length and must meet NCHRP Report 350 or MASH requirements.
- When used for overnight closures, two Type B High Intensity Lights shall supplement all barricades that are placed in a closed lane or that extend across a highway. Two Type A Low Intensity Lights may be used in urban areas if approved by the Engineer (See AML).
- When signs and lights are to be mounted to a barricade, they must meet NCHRP Report 350 or MASH requirements.
- A truck with a TMA may be substituted for a barricade when workers are present.
- Barricades shall be placed:
 - at the beginning of a closed lane or shoulder and at 1,000 foot intervals where no active work is ongoing and the lane must remain closed. A minimum of 2 barricades shall be placed if the lane or shoulder closure is less than 2,000 feet. (One barricade shall be placed at the beginning of the lane closure after the buffer space and one shall be placed in the middle of the lane closure.)
 - before each or group of unfilled holes or holes filled with temporary material.
 - before uncured concrete.
 - in the closed lane on each side of every intersection and crossover. (Do not block sight distance.)
 - in front of piles of material (dirt, aggregate, broken concrete), culverts and equipment which is near the work zone.



TTC for DROP-OFFS

Average Drop-off	Current Posted Speed (Prior to Construction)	
	> 45 MPH	≤ 45 MPH
≤ 3 IN	Low Shoulder Sign (Optional)	Low Shoulder Sign (Optional)
> 3 IN ≤ 6 IN	Shoulder Drop Off Sign & Edge Lines or Shoulder Drop Off Sign & Channelizing Device	Shoulder Drop Off Sign
> 6 IN ≤ 10 IN	No Shoulder Sign, Edge Lines & Vertical Panel	No Shoulder Sign & Channelizing Device
> 10 IN	Concrete Barrier (if drop off is < 12 FT from edge of travel lane) & Edge Lines	No Shoulder Sign & Vertical Panel

Average Drop-off	Current Posted Speed (Prior to Construction)	
	> 45 MPH	≤ 45 MPH
≤ 2 IN	Low Shoulder Sign (Optional)	Low Shoulder Sign (Optional)
> 2 IN ≤ 6 IN	Shoulder Drop Off Sign & Edge Lines or Shoulder Drop Off Sign & Channelizing Device	Shoulder Drop Off Sign
> 6 IN	Concrete Barrier (if drop off is < 12 FT from edge of travel lane), Shoulder Drop Off Sign, & Edge Lines	No Shoulder Sign & Vertical Panel

- If a portable concrete barrier will be required then the deflection shall be considered in the design.
- For Interstate ramps, refer to non-Interstate drop offs.

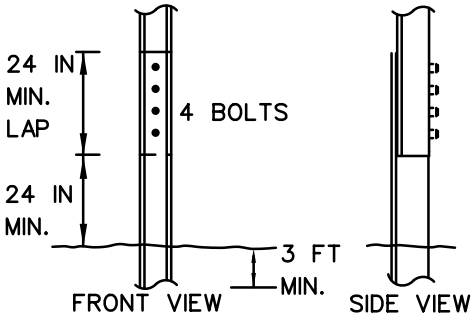
STANDARD DEVICE SPACING AND BUFFER SPACE

SPEED LIMIT (prior to construction)	MERGING TAPER LENGTH (L)				STANDARD DEVICE SPACING IN FEET		BUFFER SPACE
	Lane Width (FT)				Along Taper	Along Tangent	
MPH	9	10	11	12	Along Taper	Along Tangent	FT
25	94	105	115	125	20	40	155
30	135	150	165	180	30	60	200
35	184	205	225	245	35	70	250
40	240	267	294	320	40	80	305
45	405	450	495	540	40	80	360
50	450	500	550	600	40	80	425
55	495	550	605	660	40	80	495
60	540	600	660	720	40	80	570
65	585	650	715	780	40	80	645
70	630	700	770	840	40	80	730
75	675	750	825	900	40	80	820

SPEED LIMIT (prior to construction)	SHIFTING TAPER LENGTH (1/2)L						STANDARD DEVICE SPACING IN FEET		BUFFER SPACE
	Lane Shift (FT)						Along Taper	Along Tangent	
MPH	2	4	6	8	10	12	Along Taper	Along Tangent	FT
25	11	21	32	42	52	63	20	40	155
30	15	30	45	60	75	90	30	60	200
35	21	41	62	82	102	123	35	70	250
40	27	54	80	107	134	160	40	80	305
45	45	90	135	180	225	270	40	80	360
50	50	100	150	200	250	300	40	80	425
55	55	110	165	220	275	330	40	80	495
60	60	120	180	240	300	360	40	80	570
65	65	130	195	260	325	390	40	80	645
70	70	140	210	280	350	420	40	80	730
75	75	150	225	300	375	450	40	80	820

SPEED LIMIT (prior to construction)	SHOULDER TAPER LENGTH (1/3)L						STANDARD DEVICE SPACING IN FEET		BUFFER SPACE
	Shoulder Width (FT)						Along Taper	Along Tangent	
MPH	2	4	6	8	10	12	Along Taper	Along Tangent	FT
25	7	14	21	28	35	42	20	40	155
30	10	20	30	40	50	60	30	60	200
35	14	28	41	55	68	82	35	70	250
40	18	36	54	72	89	107	40	80	305
45	30	60	90	120	150	180	40	80	360
50	34	67	100	134	167	200	40	80	425
55	37	74	110	147	184	220	40	80	495
60	40	80	120	160	200	240	40	80	570
65	44	87	130	174	217	260	40	80	645
70	47	94	140	187	234	280	40	80	730
75	50	100	150	200	250	300	40	80	820

- See MUTCD for taper formulas.
- ALLOWABLE LAP SPLICE FOR U-CHANNEL POST**
U-Channel posts may be spliced where long lengths are required. The upper section shall overlap the lower section by at least 24 inches. The bottom edge of the upper section of the splice shall be a minimum of 24 inches above the ground. The spliced sections shall be secured with at least four 5/16 inch diameter hex bolts spaced equally along the splice.



SHEET NUMBER

PARISH

DESIGN

CHECK

DETAIL

CHECK

REVIEW

SERIES

B. BOUCHER

M. RILOVICH

CONTROL SECTION

STATE PROJECT

APPROVED BY CHIEF ENGINEER

DATE

Feb. 7, 2025

BRB

BY

DOWNSTREAM TAPERS AND MINOR CORRECTIONS

REVISION OR CHANGE ORDER DESCRIPTION

4-3-24

DATE

NO.

1

TEMPORARY TRAFFIC CONTROL GENERAL NOTES SHEET

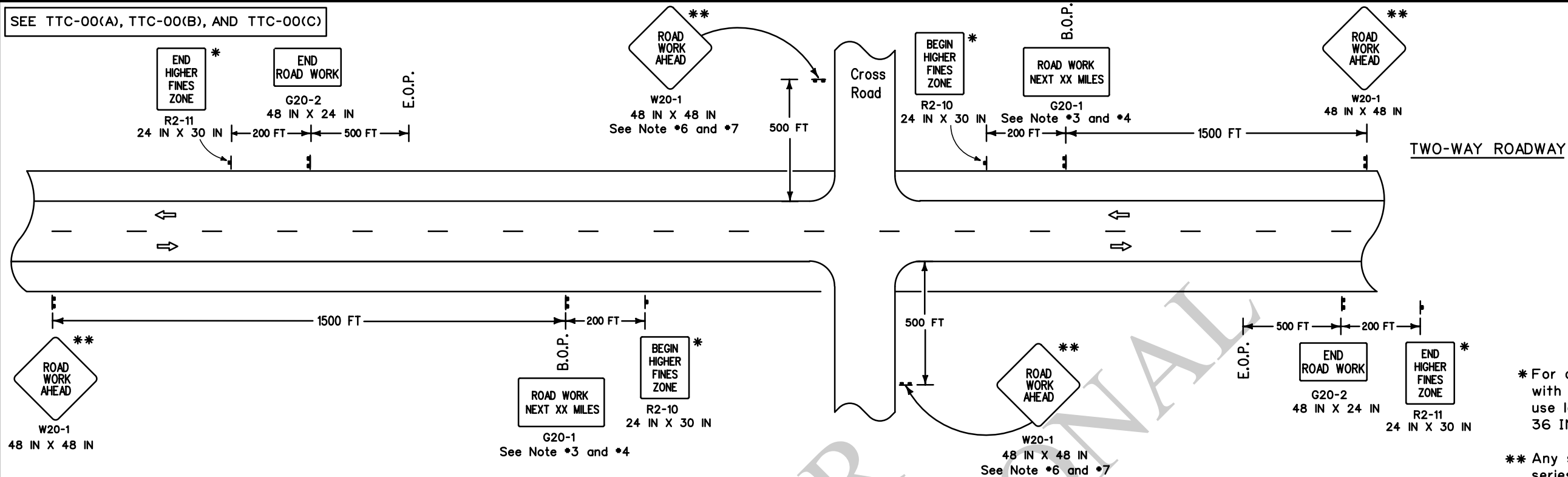
TTC-00 (C)

DOTD

LOUISIANA DEPARTMENT OF TRANSPORTATION & DEVELOPMENT

TRAFFIC ENGINEERING

SEE TTC-00(A), TTC-00(B), AND TTC-00(C)



* For divided roadways with speeds ≥ 50 mph use larger sign, 36 IN X 48 IN.

** Any sign of the W20-1 series may be used.

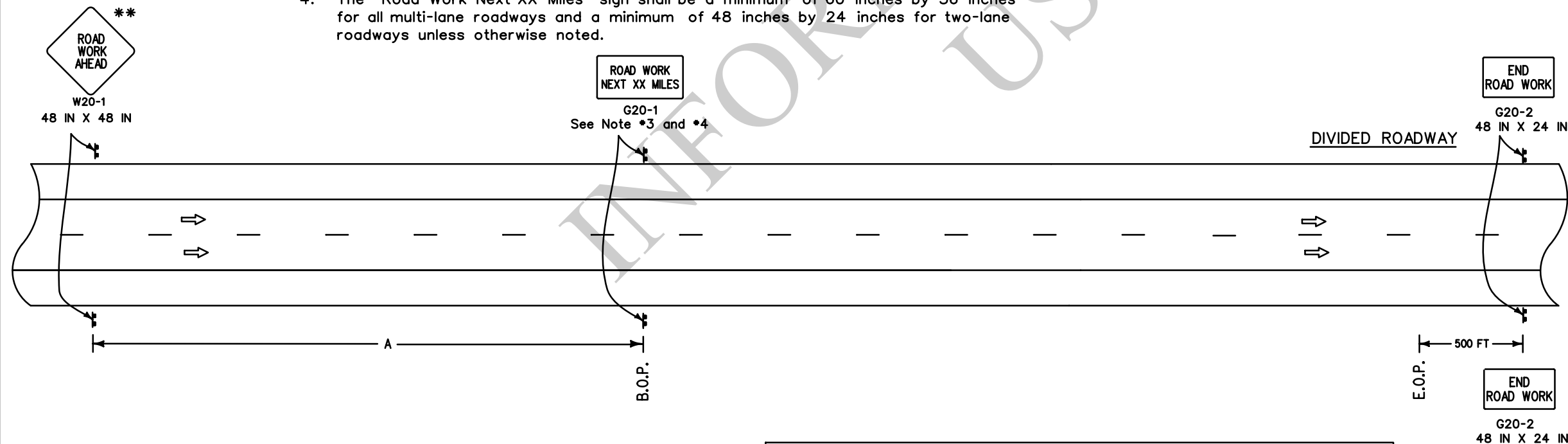
NOTES

This sheet shall be used with the Temporary Traffic Control General Notes Sheets TTC-00(A), TTC-00(B), TTC-00(C), and other Temporary Traffic Control Sheets as appropriate.

LEGEND

- ⏏ Traffic Sign
⇒ Direction of Travel

- This layout represents the minimum traffic controls required for placement of "Road Work Next XX Miles" and "End Road Work" signs.
- This layout does not replace other TTC Standard Sheets, but is intended as a supplement to the required signing.
- The distance on the "Road Work Next XX Miles" sign shall be rounded up to the nearest whole mile. This sign shall be placed at the Beginning of Project (B.O.P.) limits. This sign may be omitted if work zone is less than 0.5 miles.
- The "Road Work Next XX Miles" sign shall be a minimum of 60 inches by 36 inches for all multi-lane roadways and a minimum of 48 inches by 24 inches for two-lane roadways unless otherwise noted.
- The "End Road Work" sign shall be placed 500 feet past the End of Project (E.O.P.) limits.
- If "Road Work Ahead" sign is used on a cross road to warn of road work on another route, then "End Road Work" sign is not required.
- When projects are separated by less than 1 mile, they shall be signed as one project; this may require coordination.



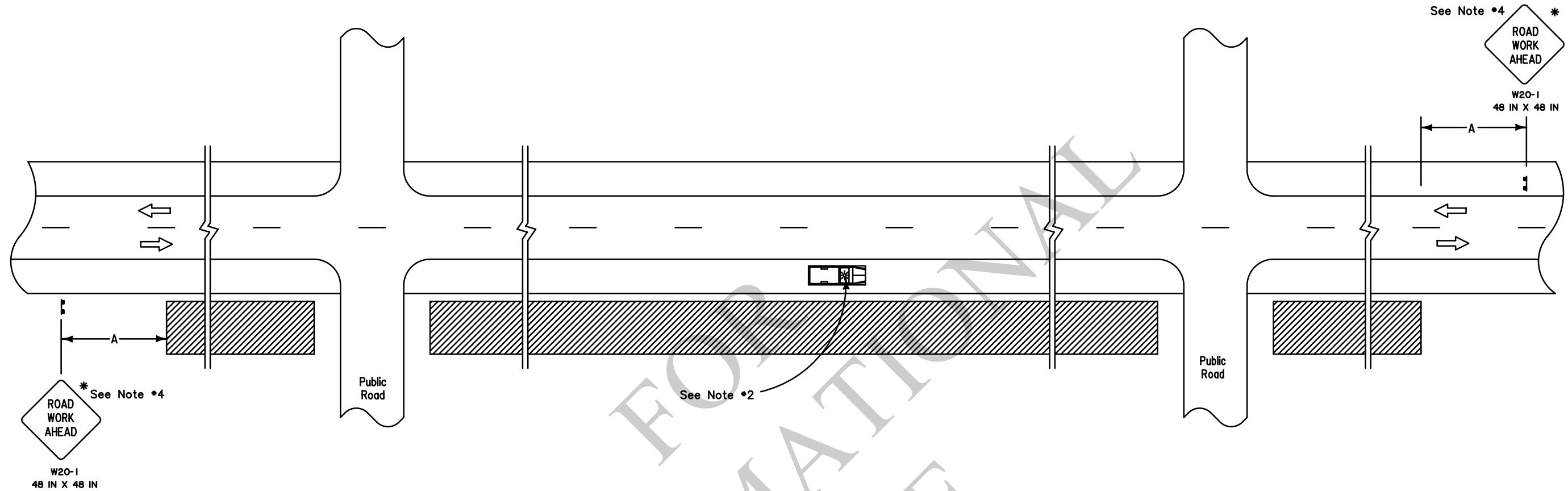
ALL TTC STANDARDS SHOW MINIMUM CONSTRUCTION SIGNING.
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CONTRACTORS ARE RESPONSIBLE FOR COMPLYING WITH ALL TTC STANDARDS.

SPEED LIMIT (prior to construction)	SPACING
	'A'
≤ 40 mph	1500 FT
45 mph	2640 FT
> 45 mph	5280 FT

- Sign spacing to be adjusted for Horizontal and Vertical curves.
- For work outside of the traveled way, see TTC-01 and TTC-02.

SHEET NUMBER	
DESIGN	PARISH
CHECK	CONTROL SECTION
DETAIL	STATE PROJECT
CHECK	REVIEW
REVIEW	SERIES *
APPROVED BY CHIEF ENGINEER	
DATE: Feb. 7, 2025	
BRB	BY
MINOR CORRECTIONS	
REVISION OR CHANGE ORDER DESCRIPTION	
4-3-24	DATE
1	NO.
LOUISIANA DEPARTMENT OF TRANSPORTATION & DEVELOPMENT	
TRAFFIC ENGINEERING	
TTC-00 (D)	

SEE TTC-00(A), TTC-00(B) AND TTC-00(C)



LEGEND

- | | |
|---|------------------------------|
|  | Traffic Sign |
|  | Work Area |
|  | Direction of Travel |
|  | Truck with Green/Amber Light |

SPEED LIMIT (prior to construction)	SPACING
	'A'
≤ 40 mph	500 FT
45-50 mph	1000 FT
≥ 55 mph	1500 FT

NOTES

This sheet shall be used with the Temporary Traffic Control General Notes Sheets TTC-00(A), TTC-00(B) and TTC-00(C).

1. This layout represents the minimum traffic controls required for workers and equipment operating more than 15 feet from the travel way.
2. If the operation results in equipment or other vehicles being parked closer than 15 feet to the travelway, but not within the roadway, each vehicle shall have an green/amber light.
3. When a work area has been established on one side of the roadway only, there shall be no parking on the opposite shoulder within 500 feet of the work area.
4. Other signs may be used in place of the "Road Work Ahead" sign, such as W21-8 (Mowing), W21-7 (Utility), or W21-6 (Survey) when applicable.

* Any sign of the W20-1 series may be used.

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TEMPORARY TRAFFIC CONTROL FOR WORK GREATER THAN 15 FEET FROM THE TRAVELED WAY											
DOTD LOUISIANA DEPARTMENT OF TRANSPORTATION & DEVELOPMENT								TTC-01			
							NO.		DATE		
							☒ 4-3-24				
							MINOR CORRECTIONS		BRB		
							REVISION OR CHANGE ORDER DESCRIPTION		BY		
									DATE:		
									Feb. 7, 2025		
									APPROVED BY CHIEF ENGINEER:		
						CHECK			B. BOUCHER		
						DRAWING			PARTISH		
						DETAIL			M. RILOVICH		
						CHECK			CONTROL SECTION		
						REVIEW			STATE PROJECT		
						SERIES #					
						SHEET NUMBER					

SEE TTC-00(A), TTC-00(B) AND TTC-00(C)

END ROAD WORK
G20-2
48 IN X 24 IN

ROAD WORK AHEAD
W20-1
48 IN X 48 IN

500 FT

Cross Road

ROAD WORK NEXT XX MILES
G20-1

SHOULDER WORK
W21-5
48 IN X 48 IN

ROAD WORK AHEAD
W20-1
48 IN X 48 IN

SHOULDER WORK
W21-5
48 IN X 48 IN

ROAD WORK AHEAD
W20-1
48 IN X 48 IN

SHOULDER DROP-OFF
W8-17P
24 IN X 24 IN

LOW SHOULDER
W8-9
48 IN X 48 IN

NO SHOULDER
W8-23
48 IN X 48 IN

ROAD WORK NEXT XX MILES
G20-1

ROAD WORK AHEAD
W20-1
48 IN X 48 IN

END ROAD WORK
G20-2
48 IN X 24 IN

LEGEND

- Traffic Sign
- Channelizing Devices
- Type III Barricades
- Work Area
- Direction of Travel
- Truck with Green/Amber Light

NOTES

- This layout represents the minimum traffic controls required for workers and equipment operating less than 15 feet from the traveled way for more than one hour. Less than one hour, see figure TA-4 of the MUTCD.
- No signs or barricades are required for equipment operating or work in progress greater than 15 feet from the traveled way. (See TTC-01).
- Work or equipment confined to a spot location (less than 200 feet) shall be marked by channelizing devices spaced at 25 feet or by a vehicle with a green/amber light visible to traffic. Work extending more than 200 feet of roadway length shall be marked with appropriate devices spaced as noted on TTC-00(C).
- Applicable drop-off sign options are defined on TTC-00(C).
- The distance on the "Road Work Next XX Miles" sign shall be rounded up to the nearest whole mile. This sign may be omitted if work zone is less than 0.5 miles.
- A vehicle with a flashing green/amber light and a truck mounted attenuator shall be used on all interstates, as well as all roadways with an ADT greater than 20,000 and a pre-construction speed greater than or equal to 40 mph. This vehicle shall move with work operations not to exceed the roll-ahead distance required by the manufacturer plus 100 feet.

SPEED LIMIT (prior to construction)

SPEED LIMIT (prior to construction)	SPACING	
	'A'	'B'
≤ 40 mph	500 FT	250 FT
45-50 mph	1000 FT	350 FT
≥ 55 mph	1500 FT	500 FT
Expressway/Interstate	2500 FT	1000 FT

See TTC-00(C) for minimum taper length and maximum device spacing for shoulder closure tapers.

If horizontal curve radius is less than 300 feet, device spacing shall be 25 feet.

ROAD WORK NEXT XX MILES
G20-1

DIVIDED ROADWAY

ROAD WORK NEXT XX MILES
G20-1

ROAD WORK AHEAD
W20-1
48 IN X 48 IN

END ROAD WORK
G20-2
48 IN X 24 IN

LEGEND

- Traffic Sign
- Channelizing Devices
- Type III Barricades
- Work Area
- Direction of Travel
- Truck with Green/Amber Light

NOTES

- This layout represents the minimum traffic controls required for workers and equipment operating less than 15 feet from the traveled way for more than one hour. Less than one hour, see figure TA-4 of the MUTCD.
- No signs or barricades are required for equipment operating or work in progress greater than 15 feet from the traveled way. (See TTC-01).
- Work or equipment confined to a spot location (less than 200 feet) shall be marked by channelizing devices spaced at 25 feet or by a vehicle with a green/amber light visible to traffic. Work extending more than 200 feet of roadway length shall be marked with appropriate devices spaced as noted on TTC-00(C).
- Applicable drop-off sign options are defined on TTC-00(C).
- The distance on the "Road Work Next XX Miles" sign shall be rounded up to the nearest whole mile. This sign may be omitted if work zone is less than 0.5 miles.
- A vehicle with a flashing green/amber light and a truck mounted attenuator shall be used on all interstates, as well as all roadways with an ADT greater than 20,000 and a pre-construction speed greater than or equal to 40 mph. This vehicle shall move with work operations not to exceed the roll-ahead distance required by the manufacturer plus 100 feet.

SPEED LIMIT (prior to construction)

SPEED LIMIT (prior to construction)	SPACING	
	'A'	'B'
≤ 40 mph	500 FT	250 FT
45-50 mph	1000 FT	350 FT
≥ 55 mph	1500 FT	500 FT
Expressway/Interstate	2500 FT	1000 FT

See TTC-00(C) for minimum taper length and maximum device spacing for shoulder closure tapers.

If horizontal curve radius is less than 300 feet, device spacing shall be 25 feet.

ROAD WORK NEXT XX MILES
G20-1

DIVIDED ROADWAY

ROAD WORK NEXT XX MILES
G20-1

ROAD WORK AHEAD
W20-1
48 IN X 48 IN

END ROAD WORK
G20-2
48 IN X 24 IN

LEGEND

- Traffic Sign
- Channelizing Devices
- Type III Barricades
- Work Area
- Direction of Travel
- Truck with Green/Amber Light

NOTES

- This layout represents the minimum traffic controls required for workers and equipment operating less than 15 feet from the traveled way for more than one hour. Less than one hour, see figure TA-4 of the MUTCD.
- No signs or barricades are required for equipment operating or work in progress greater than 15 feet from the traveled way. (See TTC-01).
- Work or equipment confined to a spot location (less than 200 feet) shall be marked by channelizing devices spaced at 25 feet or by a vehicle with a green/amber light visible to traffic. Work extending more than 200 feet of roadway length shall be marked with appropriate devices spaced as noted on TTC-00(C).
- Applicable drop-off sign options are defined on TTC-00(C).
- The distance on the "Road Work Next XX Miles" sign shall be rounded up to the nearest whole mile. This sign may be omitted if work zone is less than 0.5 miles.
- A vehicle with a flashing green/amber light and a truck mounted attenuator shall be used on all interstates, as well as all roadways with an ADT greater than 20,000 and a pre-construction speed greater than or equal to 40 mph. This vehicle shall move with work operations not to exceed the roll-ahead distance required by the manufacturer plus 100 feet.

SPEED LIMIT (prior to construction)

SPEED LIMIT (prior to construction)	SPACING	
	'A'	'B'
≤ 40 mph	500 FT	250 FT
45-50 mph	1000 FT	350 FT
≥ 55 mph	1500 FT	500 FT
Expressway/Interstate	2500 FT	1000 FT

See TTC-00(C) for minimum taper length and maximum device spacing for shoulder closure tapers.

If horizontal curve radius is less than 300 feet, device spacing shall be 25 feet.

ROAD WORK NEXT XX MILES
G20-1

DIVIDED ROADWAY

ROAD WORK NEXT XX MILES
G20-1

ROAD WORK AHEAD
W20-1
48 IN X 48 IN

END ROAD WORK
G20-2
48 IN X 24 IN

LEGEND

- Traffic Sign
- Channelizing Devices
- Type III Barricades
- Work Area
- Direction of Travel
- Truck with Green/Amber Light

NOTES

- This layout represents the minimum traffic controls required for workers and equipment operating less than 15 feet from the traveled way for more than one hour. Less than one hour, see figure TA-4 of the MUTCD.
- No signs or barricades are required for equipment operating or work in progress greater than 15 feet from the traveled way. (See TTC-01).
- Work or equipment confined to a spot location (less than 200 feet) shall be marked by channelizing devices spaced at 25 feet or by a vehicle with a green/amber light visible to traffic. Work extending more than 200 feet of roadway length shall be marked with appropriate devices spaced as noted on TTC-00(C).
- Applicable drop-off sign options are defined on TTC-00(C).
- The distance on the "Road Work Next XX Miles" sign shall be rounded up to the nearest whole mile. This sign may be omitted if work zone is less than 0.5 miles.
- A vehicle with a flashing green/amber light and a truck mounted attenuator shall be used on all interstates, as well as all roadways with an ADT greater than 20,000 and a pre-construction speed greater than or equal to 40 mph. This vehicle shall move with work operations not to exceed the roll-ahead distance required by the manufacturer plus 100 feet.

SPEED LIMIT (prior to construction)

SPEED LIMIT (prior to construction)	SPACING	
	'A'	'B'
≤ 40 mph	500 FT	250 FT
45-50 mph	1000 FT	350 FT
≥ 55 mph	1500 FT	500 FT
Expressway/Interstate	2500 FT	1000 FT

See TTC-00(C) for minimum taper length and maximum device spacing for shoulder closure tapers.

If horizontal curve radius is less than 300 feet, device spacing shall be 25 feet.

ROAD WORK NEXT XX MILES
G20-1

DIVIDED ROADWAY

ROAD WORK NEXT XX MILES
G20-1

ROAD WORK AHEAD
W20-1
48 IN X 48 IN

END ROAD WORK
G20-2
48 IN X 24 IN

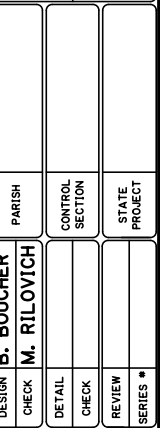
LEGEND

- Traffic Sign
- Channelizing Devices
- Type III Barricades
- Work Area
- Direction of Travel
- Truck with Green/Amber Light

NOTES

- This layout represents the minimum traffic controls required for workers and equipment operating less than 15 feet from the traveled way for more than one hour. Less than one hour, see figure TA-4 of the MUTCD.
- No signs or barricades are required for equipment operating or work in progress greater than 15 feet from the traveled way. (See TTC-01).
- Work or equipment confined to a spot location (less than 200 feet) shall be marked by channelizing devices spaced at 25 feet or by a vehicle with a green/amber light visible to traffic. Work extending more than 200 feet of roadway length shall be marked with appropriate devices spaced as noted on TTC-00(C).
- Applicable drop-off sign options are defined on TTC

TEMPORARY TRAFFIC CONTROL LAYOUT FOR WORK LESS THAN 15 FEET FROM THE TRAVELED WAY  TTC-02										APPROVED BY CHIEF ENGINEER		DESIGN CHECK DETAIL CHECK		B. BOUCHER M. RILOVICH		PARISH		SHEET NUMBER	
										DATE: Feb. 7, 2025						CONTROL SECTION			
										BRB BY						REVIEW SERIES *		STATE PROJECT	
										4-3-24 DATE		☒							
										MINOR CORRECTIONS REVISION OR CHANGE ORDER DESCRIPTION									



DATE: Feb. 7, 2025



SEE TTC-00(A), TTC-00(B), TTC-00(C), AND TTC-00(D)

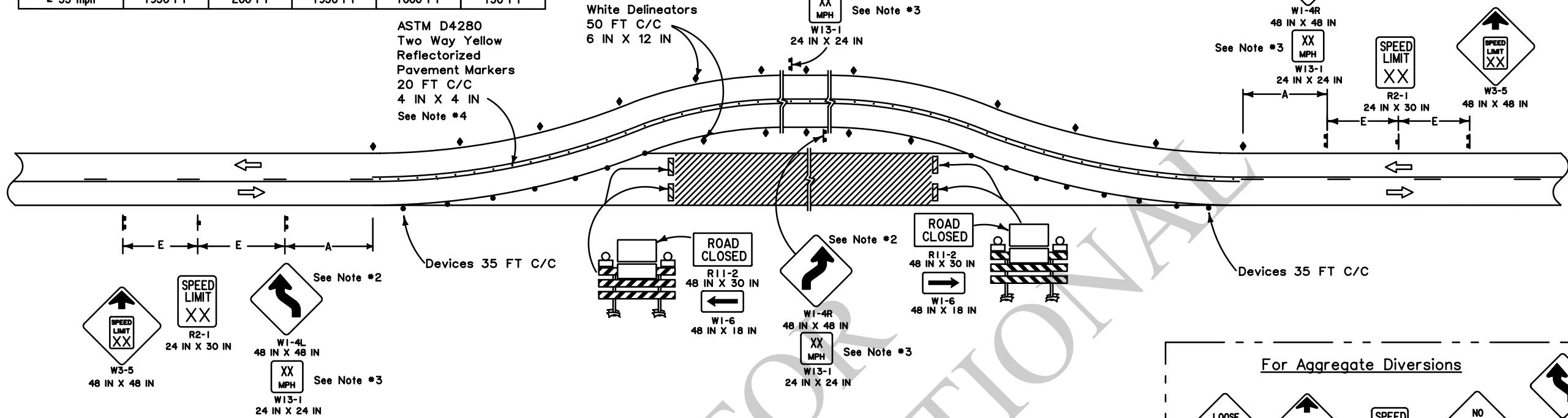
LEGEND

- Traffic Sign
- Channelizing Devices
- Type III Barricades
- Single White Delineators (6IN X 12 IN)
- ReflectORIZED Pavement Markers
- Type B Light
- Direction of Travel

SPEED LIMIT (prior to construction)	SPACING				
	'A'	'B'	'C'	'D'	'E'
≤ 40 mph	60 FT	60 FT	80 FT	100 FT	N/A
45-50 mph	425 FT	150 FT	425 FT	500 FT	100 FT
≥ 55 mph	1950 FT	200 FT	1950 FT	1000 FT	150 FT

ASTM D4280
Two Way Yellow
ReflectORIZED
Pavement Markers
20 FT C/C
4 IN X 4 IN
See Note #4

White Delineators
50 FT C/C
6 IN X 12 IN



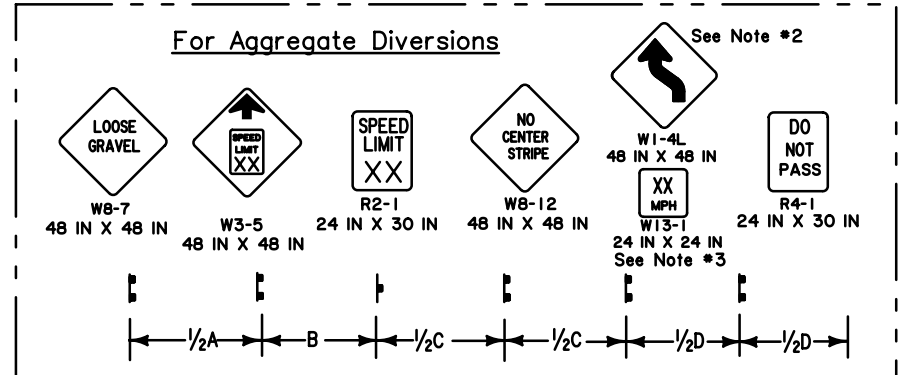
NOTES

This sheet shall be used with the Temporary Traffic Control General Notes Sheets TTC-00(A), TTC-00(B), TTC-00(C), and TTC-00(D).

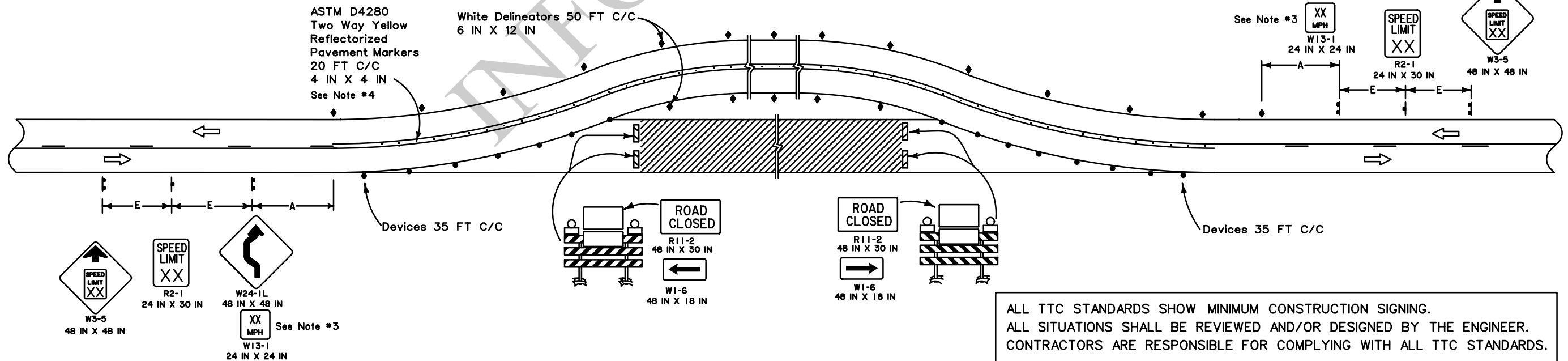
- This layout represents the minimum traffic controls required for a paved or aggregate diversion. For advance signing see TTC-00(D).
- If advisory speed is less than 35 mph, the reverse curve signs (W1-4L or W1-4R) will be changed to reverse turn sign (W1-3L or W1-3R).
- Advisory speed plaques (W13-1) shall be required if the difference between the speed limit prior to construction and the advisory speed (determined by an engineering study performed by the DTOE) is 10 mph or greater.

- Paved Diversions shall be striped with double yellow solid lines and raised pavement markings as per LADOTD Pavement Marking Standards.
- Aggregate Diversions shall include "Do Not Pass" (R4-1) signs, "Loose Gravel" (W8-7) signs, and "No Center Stripe" (W8-12) signs and either supercones or flex posts to delineate the centerline.

For Aggregate Diversions

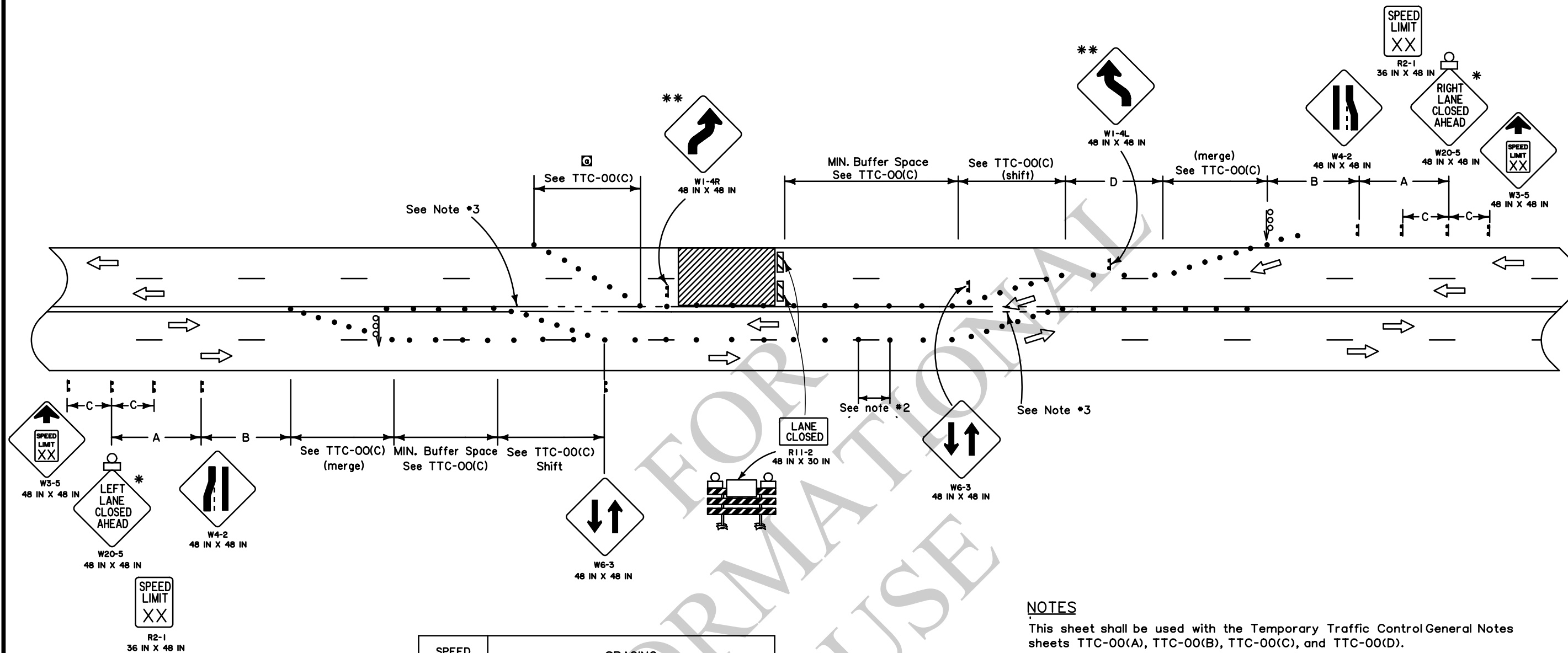


For tangent distances along the diversion less than or equal to 600 FT



ALL TTC STANDARDS SHOW MINIMUM CONSTRUCTION SIGNING.
ALL SITUATIONS SHALL BE REVIEWED AND/OR DESIGNED BY THE ENGINEER.
CONTRACTORS ARE RESPONSIBLE FOR COMPLYING WITH ALL TTC STANDARDS.

SHEET NUMBER		PARISH		CONTROL SECTION		STATE PROJECT	
DESIGN	CHECK	DETAIL	CHECK	REVIEW	SERIES		
APPROVED BY CHIEF ENGINEER		DATE		BY			
REVISION OR CHANGE ORDER DESCRIPTION		DATE		NO.			
TEMPORARY TRAFFIC CONTROL FOR ON SITE DIVERSION WITH TWO-WAY TRAFFIC		TTC-05		LOUISIANA DEPARTMENT OF TRANSPORTATION & DEVELOPMENT		TRAFFIC ENGINEERING	



LEGEND

- Traffic Sign
- Channelizing Devices
- Type III Barricades
- Flashing Arrow Board (Type 'C')
- Work Area
- Type B Light
- Direction of Travel

SPEED LIMIT (prior to construction)	SPACING			
	'A'	'B'	'C'	'D'
25 mph	250 FT	250 FT	N/A	65 FT
30 mph	250 FT	250 FT	N/A	90 FT
35 mph	500 FT	350 FT	N/A	125 FT
40 mph	500 FT	350 FT	N/A	160 FT
45 mph	1000 FT	500 FT	500 FT	270 FT
50 mph	1640 FT	1000 FT	800 FT	300 FT
55 mph	1640 FT	1000 FT	800 FT	330 FT

* Any sign of the W20-5 series may be used.

** In order to give road users advance notice of a lane shift, a Reverse Curve (W1-4, W1-4b or W1-4c) sign should be used when a lane (or lanes) is being shifted to the left or right. If a Reverse Curve sign is used and design speed of the curves is 30 mph or less, a Reverse Turn (W1-3) sign shall be used.

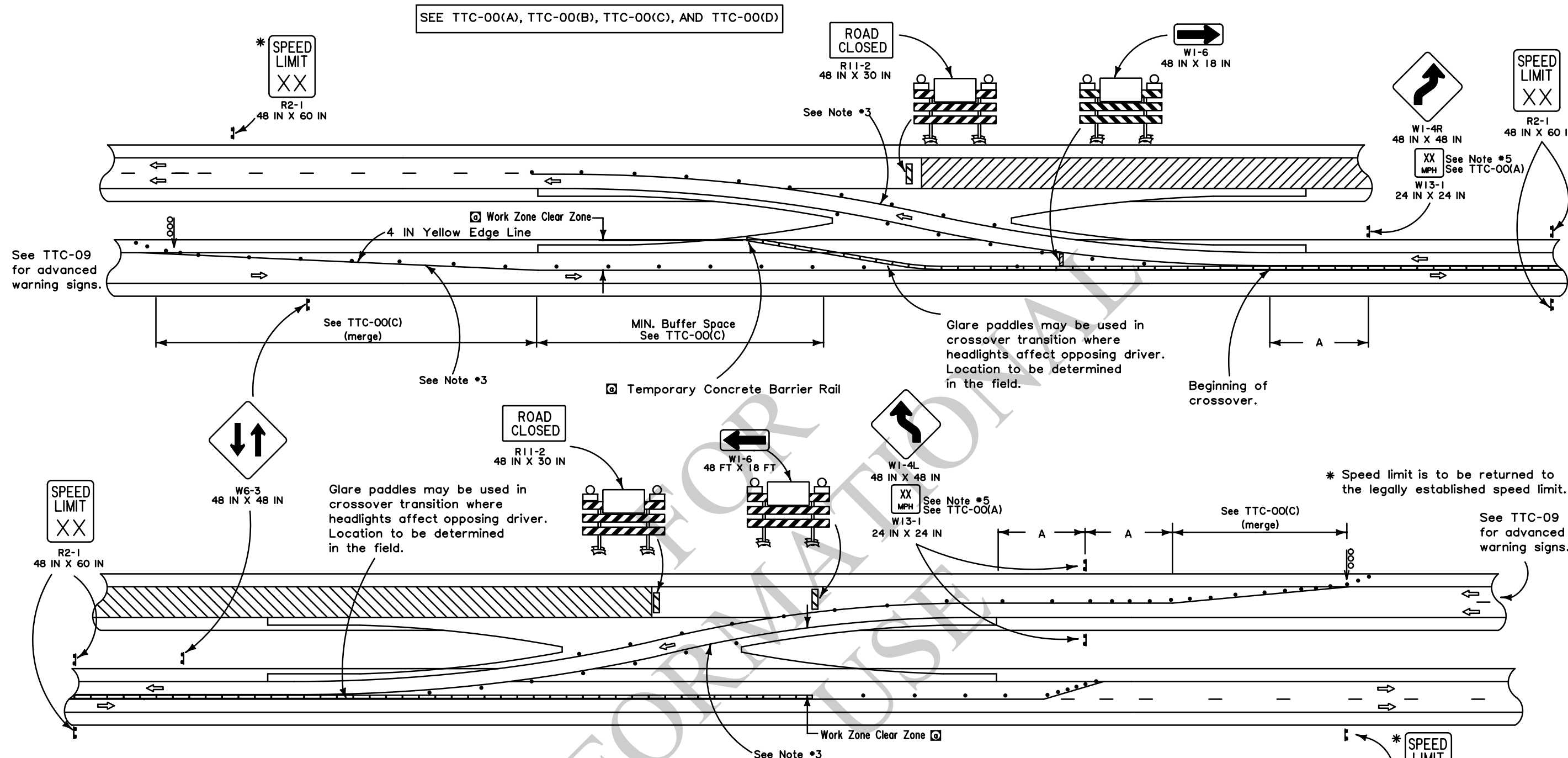
NOTES

This sheet shall be used with the Temporary Traffic Control General Notes sheets TTC-00(A), TTC-00(B), TTC-00(C), and TTC-00(D).

- This layout represents the minimum traffic controls required for closure of two adjacent lanes on a four-lane undivided highway. For advance signing see TTC-00(D).
- During daytime operations, traffic cones may be used to separate traffic lanes. When this layout is authorized to be used during nighttime hours or if the width of the traffic lanes are less than 11 feet, the contractor shall be required to use flex posts or super cones to separate head-to-head (two-lane two way traffic) spaced at 20 feet in tangent and 10 feet in taper.
- When traffic control is planned to be in place for more than 3 days, conflicting pavement markings shall be removed and temporary markings added.
- A flagger shall be used to alert motorists when equipment or workers encroach within 2 feet of an open lane. The flagger shall be posted inside the work zone, adjacent to the open travel lane, and immediately upstream of each operation to facilitate ingress/egress of construction equipment and vehicles. Encroachment shall be held to a minimum.

ALL TTC STANDARDS SHOW MINIMUM CONSTRUCTION SIGNING.
ALL SITUATIONS SHALL BE REVIEWED AND/OR DESIGNED BY THE ENGINEER.
CONTRACTORS ARE RESPONSIBLE FOR COMPLYING WITH ALL TTC STANDARDS.

SHEET NUMBER		PARISH		STATE PROJECT	
DESIGN		CHECK		REVIEW	
DETAIL		CHECK		SERIES *	
APPROVED BY CHIEF ENGINEER		DATE		BY	
CLARIFY TAPER LENGTHS		REVISION OR CHANGE ORDER DESCRIPTION		DATE	
NO.		4-3-24		DATE	
TEMPORARY TRAFFIC CONTROL FOR CLOSURE OF TWO ADJACENT LANES ON FOUR-LANE UNDIVIDED HIGHWAYS		TTC-07			
DOTD		LOUISIANA DEPARTMENT OF TRANSPORTATION & DEVELOPMENT		TRAFFIC ENGINEERING	



NOTES

This sheet shall be used with Temporary Traffic Control General Notes Sheets TTC-00(A), TTC-00(B), TTC-00(C), and TTC-00(D).

1. This layout represents the minimum traffic controls required for median crossovers on divided highways. For advance signing see TTC-00(D) and TTC-09.
2. For posted speed limits prior to construction that are greater than 45 mph, concrete barriers shall be required to separate the lanes of travel. For posted speed limits prior to construction that are 45 mph or less, concrete barriers may be substituted by tubular markers or flexposts.
3. Temporary raised pavement markers spaced at 15 FT C/C shall be used to supplement the white and yellow temporary edge lines through the reverse curves of the crossover. All temporary edge lines between the barrier rail and the beginning of the lane reduction taper shall have temporary raised pavement markers spaced at 15 FT C/C.
4. When traffic control is planned to be in place for more than 3 days, conflicting pavement markings shall be removed and temporary markings added.
5. Advisory speed plaques (W13-1) shall be required if the difference between the speed limit prior to construction and the advisory speed (determined by an engineering study performed by the DTOE) is 10 mph or greater.

SPEED LIMIT (prior to construction)	SPACING 'A'
25 mph	63 FT
30 mph	90 FT
35 mph	123 FT
40 mph	160 FT
45 mph	270 FT
50 mph	300 FT
55 mph	330 FT

ALL TTC STANDARDS SHOW MINIMUM CONSTRUCTION SIGNING.
ALL SITUATIONS SHALL BE REVIEWED AND/OR DESIGNED BY THE ENGINEER.
CONTRACTORS ARE RESPONSIBLE FOR COMPLYING WITH ALL TTC STANDARDS.

- LEGEND**
- Traffic Sign
 - Channelizing Devices
 - Type III Barricades
 - Flashing Arrow Board (Type 'C')
 - Work Area
 - Temporary Concrete Barrier
 - Type B Light
 - Direction of Travel

SHEET NUMBER

PARISH

DESIGN

CHECK

DETAIL

REVIEW

SERIES

STATE PROJECT

CONTROL SECTION

DATE

BRB

BY

BOUCHER

M. RILOVICH

APPROVED BY CHIEF ENGINEER

Feb 7, 2025

CLARIFY WORK ZONE CLEAR ZONE AND MINOR CORRECTIONS

4-5-24

DATE

NO.

DATE

LOUISIANA DEPARTMENT OF TRANSPORTATION & DEVELOPMENT

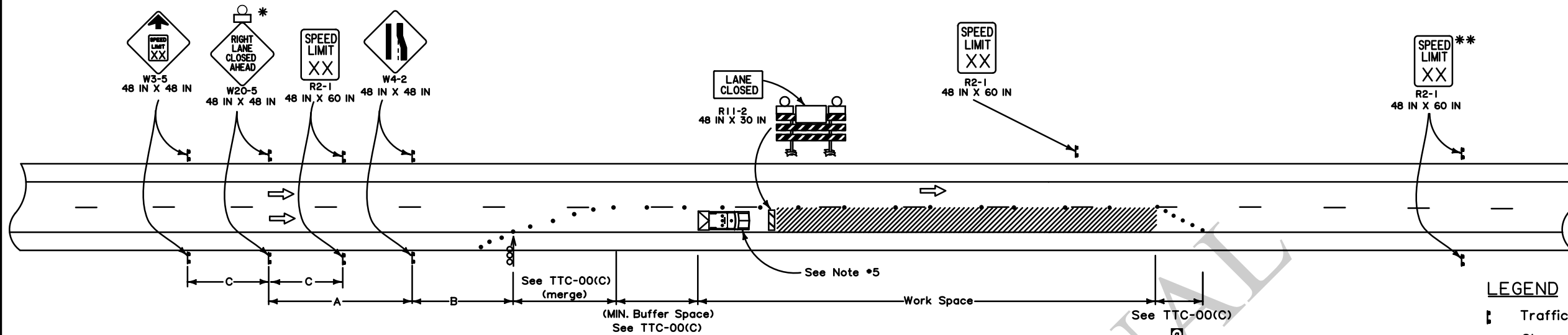
TRAFFIC ENGINEERING

TEMPORARY TRAFFIC CONTROL FOR MEDIAN CROSSOVER FOR DIVIDED HIGHWAYS

TTC-08

RIGHT LANE CLOSURE

SEE TTC-00(A), TTC-00(B), TTC-00(C), AND TTC-00(D)



SPEED LIMIT (prior to construction)	SPACING		
	'A'	'B'	'C'
45 mph	1000 FT	500 FT	500 FT
50 mph	1000 FT	500 FT	500 FT
≥ 55 mph	1640 FT	1000 FT	800 FT

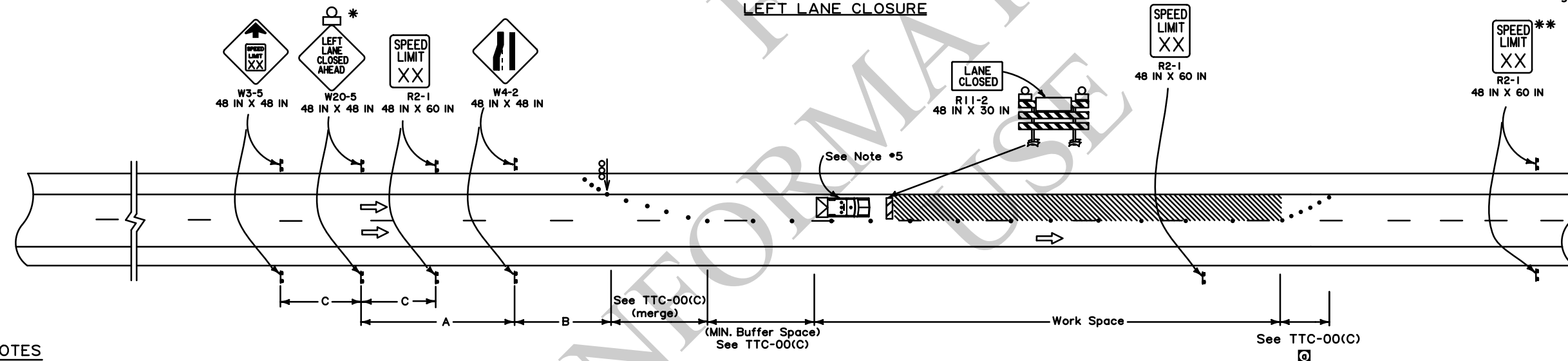
LEGEND

- Traffic Sign
- Channelizing Devices
- Type III Barricades
- Flashing Arrow Board (Type 'C')
- Work Area
- Type B Light
- Direction of Travel
- Truck with Green/Amber Light and TMA

* Any sign of the W20-5 series may be used.

** Speed limit is to be returned to legally established speed limit.

LEFT LANE CLOSURE



NOTES

This sheet shall be used with the Temporary Traffic Control General Notes Sheets TTC-00(A), TTC-00(B), TTC-00(C), and TTC-00(D).

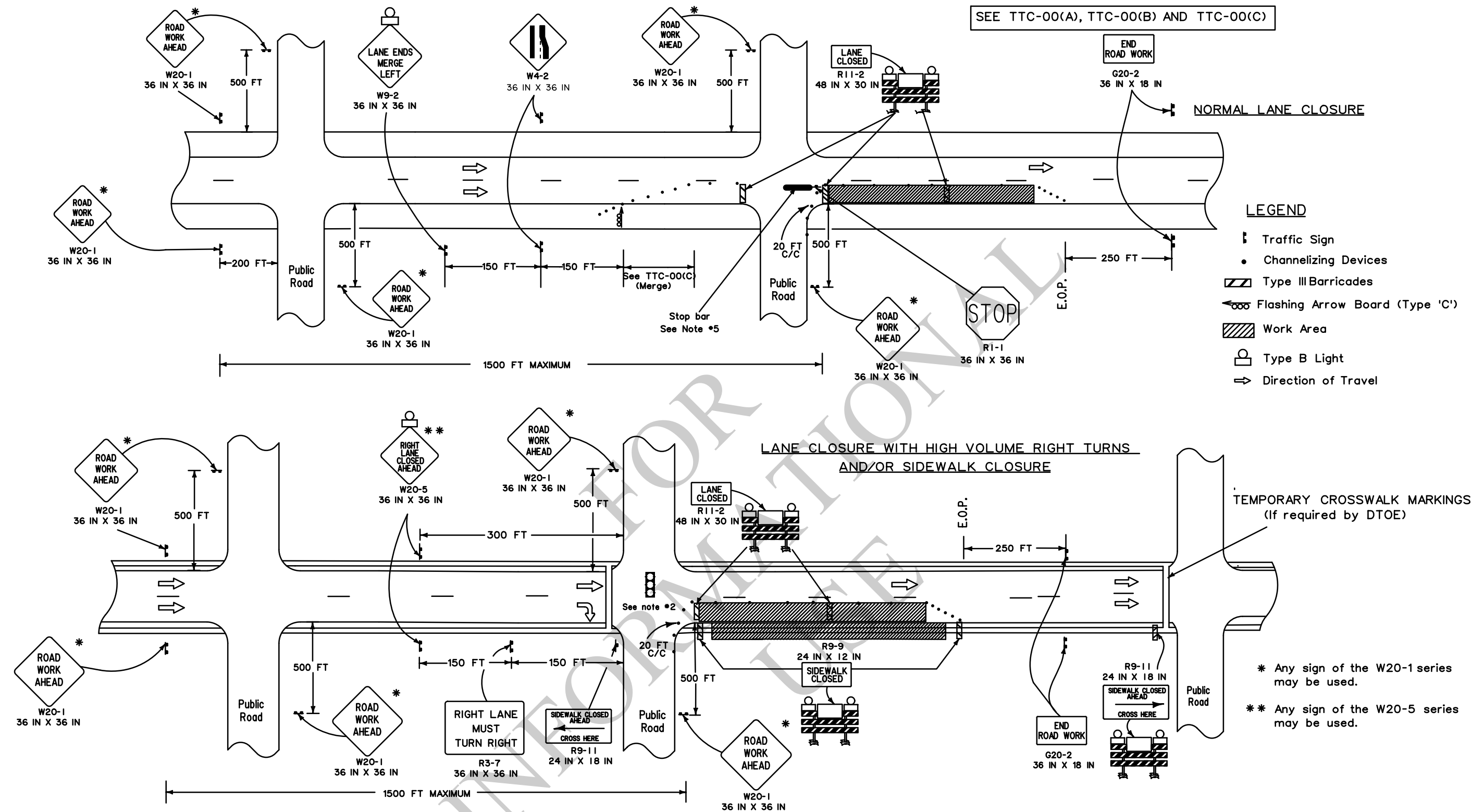
- This layout represents the minimum traffic controls required for lane closures on divided highways with speed limits greater than 40 mph. This layout does not cover roadwork where a ramp entrance or an exit taper falls within the work area. For advance signing see TTC-00(D).
- This layout does not illustrate roadwork near a signal or a major intersection.
- Sign spacing may be adjusted due to access conditions of the corridor.
- If speed limit is less than 45 mph, see TTC-10.

- A vehicle with a flashing green/amber light and a truck mounted attenuator shall be used on all interstate projects or on all roadways with an ADT greater than 20,000 and a pre-construction speed greater than or equal to 40 mph. This vehicle shall move with work operations not to exceed the roll-ahead distance required by the manufacturer plus 100 feet.
- A flagger shall be used to alert motorists when equipment or workers encroach within 2 feet of an open lane. The flagger shall be posted inside the work zone, adjacent to the open travel lane, and immediately upstream of each operation to facilitate ingress/egress of construction equipment and vehicles. Encroachment shall be held to a minimum.

- A "Road Work Ahead" sign shall be placed within 1000 feet ahead of the entrance ramp nose for any ramp within the area of traffic control signing.

ALL TTC STANDARDS SHOW MINIMUM CONSTRUCTION SIGNING.
ALL SITUATIONS SHALL BE REVIEWED AND/OR DESIGNED BY THE ENGINEER.
CONTRACTORS ARE RESPONSIBLE FOR COMPLYING WITH ALL TTC STANDARDS.

SHEET NUMBER	PARISH	CONTROL SECTION	STATE PROJECT
DESIGN	BY B. BOUCHER	CHECK	DATE
DETAIL	BY M. RILOVICH	CHECK	DATE
REVIEW	BY	CHECK	DATE
SERIES	BY	CHECK	DATE
APPROVED BY CHIEF ENGINEER	DATE	BY	DATE
CLARIFY TAPER LENGTHS AND MINOR CORRECTIONS	DATE	BY	DATE
REVISION OR CHANGE ORDER DESCRIPTION	DATE	BY	DATE
NO.	DATE	BY	DATE
TEMPORARY TRAFFIC CONTROL FOR LANE CLOSURES ON DIVIDED HIGHWAYS (Does not include ramp entrance or exit tapers)			
TTC-09			
DOTD LOUISIANA DEPARTMENT OF TRANSPORTATION & DEVELOPMENT			
TRAFFIC ENGINEERING			



NOTES

This sheet shall be used with the Temporary Traffic Control General Notes Sheets TTC-00(A), TTC-00(B) and TTC-00(C).

- This layout represents the minimum traffic controls required for lane closures in areas with a grid layout and with speed limits of 40 mph and below. This layout illustrates roadwork near a signal or a major intersection with or without sidewalks.
- If a signal is involved in the construction zone, a specific temporary traffic signal timing and phasing plan for each phase of construction shall be developed.

- Bicyclists and pedestrians, including those with disabilities, should be provided with access and reasonably safe passage through the TTC zone.
- The sign height shall be at least 7 feet in business, commercial, and residential areas and also near parking, pedestrians, bicyclists, or other obstructions.
- Place stop bars if work duration is greater than 3 days.

- Place "Road Work Ahead" sign prior to an intersecting alternate route, no more than 1500 feet from the work area.
- When crosswalks or other pedestrian facilities are closed or relocated, temporary facilities shall be detectable and shall include accessibility features consistent with the features in the existing pedestrian facility as defined in the MUTCD.

ALL TTC STANDARDS SHOW MINIMUM CONSTRUCTION SIGNING.
ALL SITUATIONS SHALL BE REVIEWED AND/OR DESIGNED BY THE ENGINEER.
CONTRACTORS ARE RESPONSIBLE FOR COMPLYING WITH ALL TTC STANDARDS.

SHEET NUMBER		PARISH		CONTROL SECTION		STATE PROJECT	
DESIGN		CHECK		DETAIL		CHECK	
APPROVED BY CHIEF ENGINEER		DATE		BY		REVISION OR CHANGE ORDER DESCRIPTION	
B. BOUCHER		M. RILOVICH		DATE		Feb. 7, 2025	
LOUISIANA DEPARTMENT OF TRANSPORTATION & DEVELOPMENT		TRAFFIC ENGINEERING		TTC-10			

NOTES

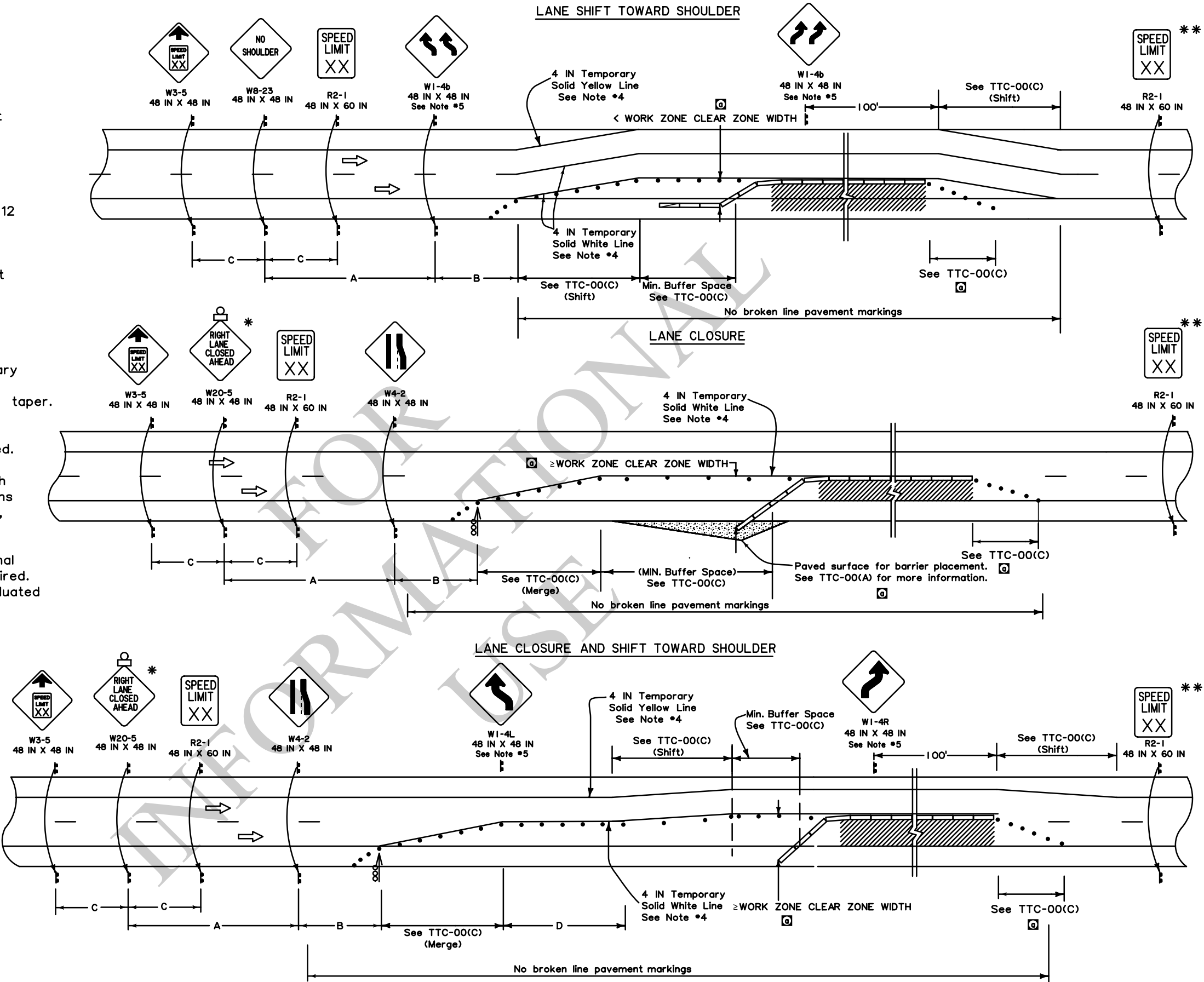
This sheet shall be used with the Temporary Traffic Control General Notes Sheets TTC-00(A), TTC-00(B), TTC-00(C), and TTC-00(D).

1. This layout represents the minimum traffic controls required for lane closures and lane shift using temporary barrier rail on divided highways. This includes freeways. For advance signing see TTC-00(D).
2. If a ramp entrance or exit taper falls within the work area, refer to standard road plan TTC-12 for traffic control details.
3. When traffic controls planned to be in place for more than 3 days, conflicting pavement markings shall be removed and temporary markings added. Existing broken line pavement marking shall be removed from the W4-2 sign through the work area.
4. For work lasting more than 3 days, a temporary edgeline shall be installed from the start of the merging taper to the far end of the downstream taper.
5. If the lane shift occurs on new pavement or existing shoulder, then W1-4R or W1-4L is required.
6. If a shoulder which is not at full pavement depth is used as a temporary travel lane, advanced signs should direct trucks to use the existing roadway, not the shoulder.
7. When traffic is diverted onto shoulder, additional shoulder work and/or soil stabilizers may be required. Shoulder and embankment stability should be evaluated beforehand.
8. Extra paved surface may be needed to maintain crashworthiness of concrete barriers. These drawings only intend to show a few scenarios/options for handling concrete barriers/attenuators that could be used.

SPEED LIMIT (prior to construction)	SPACING			
	'A'	'B'	'C'	'D'
45 mph	1000 FT	500 FT	500 FT	300 FT
50 mph	1000 FT	500 FT	500 FT	300 FT
≥ 55 mph	1640 FT	1000 FT	800 FT	450 FT

- LEGEND
- Traffic Sign
- Channelizing Devices
- Flashing Arrow Board (Type 'C')
- Work Area
- Type B Light
- Concrete Barrier
- Direction of Travel
- Attenuator

SEE TTC-00(A), TTC-00(B), TTC-00(C), AND TTC-00(D)



ALL TTC STANDARDS SHOW MINIMUM CONSTRUCTION SIGNING.
ALL SITUATIONS SHALL BE REVIEWED AND/OR DESIGNED BY THE ENGINEER.
CONTRACTORS ARE RESPONSIBLE FOR COMPLYING WITH ALL TTC STANDARDS.

- * Any sign of the W20-5 series may be used.
- ** Speed limit is to be returned to legally established speed limit.

SHEET NUMBER

PARISH

CONTROL SECTION

STATE PROJECT

DESIGN

CHECK

DETAIL

CHECK

REVIEW

SERIES

APPROVED BY CHIEF ENGINEER

DATE

BRB

BY

CLARIFY BARRIER USE AND MINOR CORRECTIONS

REVISION OR CHANGE ORDER DESCRIPTION

4-3-24

DATE

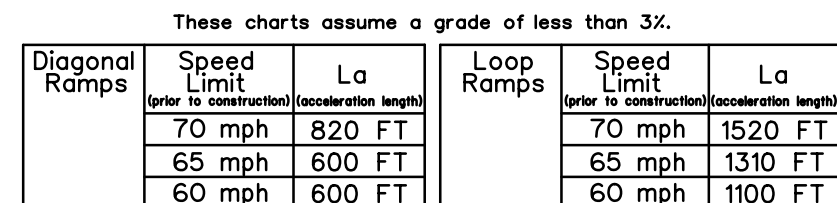
NO.

TEMPORARY TRAFFIC CONTROL FOR LANE CLOSURE USING TEMPORARY BARRIER RAIL ON DIVIDED HIGHWAYS (INCLUDES FREEWAYS)

TTC-11

DOTD
LOUISIANA DEPARTMENT OF TRANSPORTATION & DEVELOPMENT
TRAFFIC ENGINEERING

SEE TTC-00(A), TTC-00(B), TTC-00(C), AND TTC-00(D)



For more information, see Chapter 10 of the AASHTO Green Book.

*Any sign of the W20-1 series may be used.

For more information, see Chapter 10 of the AASHTO Green Book.

****The temporary green and white "Exit" sign (E5-1) shall be 48 IN X 48 IN.**

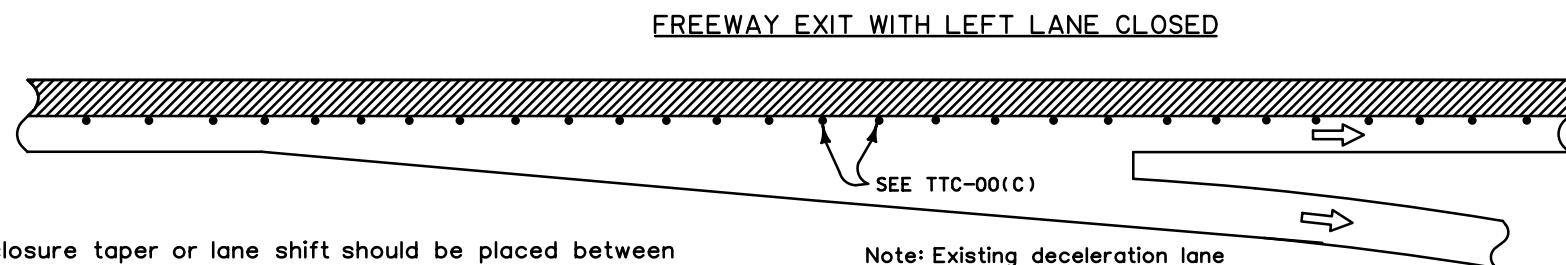
This sheet shall be used with the Temporary Traffic Control General Notes Sheets TTC-00(A), TTC-00(B), TTC-00(C), and TTC-00(D).

1. This layout represents the minimum traffic controls required for a temporary work area with lane closures through ramp entrances and exit tapers on a freeway. For advance signing see TTC-00(D).
2. For mainline lane closures see TTC-09, TTC-10 or TTC-11.
3. The mounting height of the temporary "Exit" sign (E5-1) shall be a minimum of 7 feet from the pavement surface to the bottom of the sign. The existing green and white "Exit" sign shall be covered.
4. If acceleration distance (L_a) and/or gap acceptance (L_g) of 300 feet cannot be achieved, the ramp shall be closed.

5. No lane closure taper or lane shift should be placed between a point 1000 feet in advance of an exit taper and a point 100 feet past the striped gore point of an exit ramp. The Engineer can reduce the 1000 feet distance requirement if field conditions justify the reduction.
6. No lane closure taper or lane shift should be placed between a point 100 feet in advance of the striped gore point of an on ramp and a point that is a distance of 2L from the end of the acceleration lane taper. See TTC-00(C) for taper lengths.

ALL TTC STANDARDS SHOW MINIMUM CONSTRUCTION SIGNING.
ALL SITUATIONS SHALL BE REVIEWED AND/OR DESIGNED BY THE ENGINEER.
CONTRACTORS ARE RESPONSIBLE FOR COMPLYING WITH ALL TTC STANDARDS.

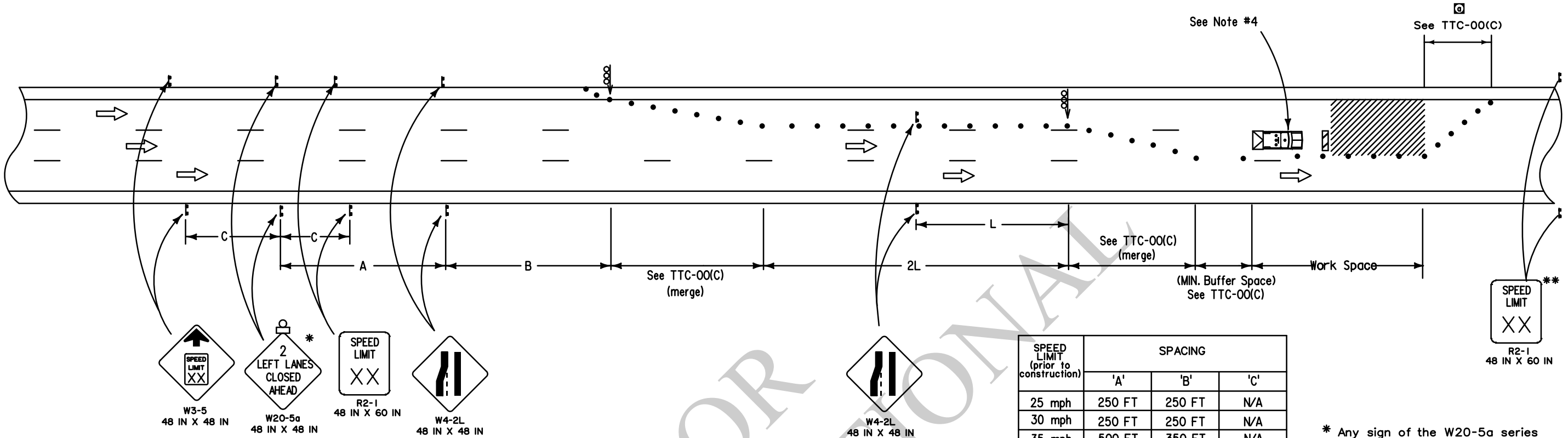
Note: Existing acceleration lane
is not affected by work
zone or lane closure.



Note: Existing deceleration lane is not affected by work zone or lane closure.

LEGEND

-  Traffic Sign
-  Channelizing Devices
-  Type III Barricades
-  Work Area
-  Type B Light
-  Direction of Travel



SPEED LIMIT (prior to construction)	SPACING		
	'A'	'B'	'C'
25 mph	250 FT	250 FT	N/A
30 mph	250 FT	250 FT	N/A
35 mph	500 FT	350 FT	N/A
40 mph	500 FT	350 FT	N/A
45 mph	1000 FT	500 FT	500 FT
50 mph	1000 FT	500 FT	500 FT
≥ 55 mph	1640 FT	1000 FT	800 FT

* Any sign of the W20-5a series may be used.

** Speed limit is to be returned to legally established speed limit.

LEGEND

- Traffic Sign
- Channelizing Devices
- Type III Barricades
- Flashing Arrow Board (Type 'C')
- Work Area
- Type B Light
- Truck with Green/Amber Light and TMA

NOTES

This sheet shall be used with the Temporary Traffic Control General Notes Sheets TTC-00(A), TTC-00(B), TTC-00(C), and TTC-00(D).

- This layout represents the minimum traffic controls required for two lanes closed on a divided 6 lane or more highway. This road work does not cover road work where a ramp entrance or exit taper falls within the work area. For advance signing see TTC-00(D).
- This layout does not illustrate road work near a signal or a major intersection.
- A "Road Work Ahead" sign shall be placed 1000 feet ahead of the entrance ramp nose for any ramp within the area of traffic control signing.
- A vehicle with a flashing green/amber light and a truck mounted attenuator shall be used on all interstate projects or on all roadways with an ADT greater than 20,000 and a pre-construction speed greater than or equal to 40 mph. This vehicle shall move with work operations not to exceed the rolldistance required by the manufacturer plus 100 feet.

ALL TTC STANDARDS SHOW MINIMUM CONSTRUCTION SIGNING.
ALL SITUATIONS SHALL BE REVIEWED AND/OR DESIGNED BY THE ENGINEER.
CONTRACTORS ARE RESPONSIBLE FOR COMPLYING WITH ALL TTC STANDARDS.

SHEET NUMBER

PARISH

DESIGN

CHECK

DETAIL

CHECK

REVIEW

SERIES

B. BOUCHER

M. RILOVICH

APPROVED BY CHIEF ENGINEER

DATE

Feb. 7, 2025

BRB

BY

4-3-24

DATE

NO.

CLARIFY TAPER LENGTH AND MINOR CORRECTIONS
REVISION OR CHANGE ORDER DESCRIPTION

STATE PROJECT

CONTROL SECTION

TRAFFIC ENGINEERING

TEMPORARY TRAFFIC CONTROL
FOR CLOSURE OF TWO LANES
ON A MULTI-LANE HIGHWAY

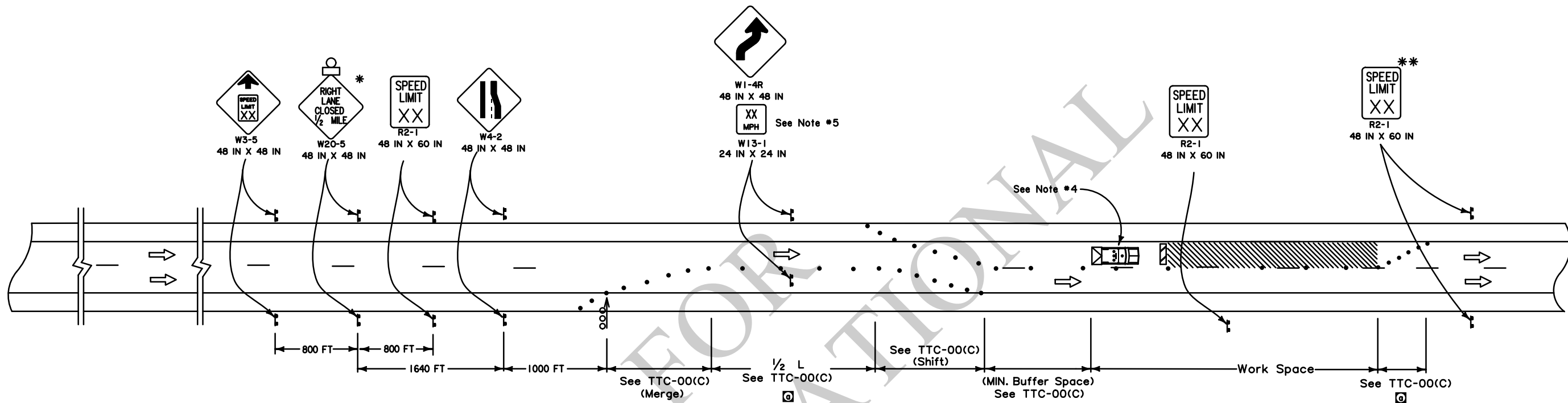
TTC-13

DOTD

LOUISIANA DEPARTMENT OF
TRANSPORTATION & DEVELOPMENT

* Any sign of the W20-5 series may be used.

** Speed limit is to be returned to legally established speed limit.



NOTES

This sheet shall be used with the Temporary Traffic Control General Notes Sheets TTC-00(A), TTC-00(B), TTC-00(C) and TTC-00(D).

1. This layout represents the minimum traffic controls required for work in the left lane that would require the left lane to be closed on rural multi-lane divided highways and all interstates where left exit and entrance ramps do not exist. For advance signing see TTC-00(D).
2. This layout does not illustrate road work where a ramp entrance or an exit taper falls within the work area.
3. This layout does not illustrate road work near a signal or a major intersection.
4. A vehicle with a flashing green/amber light and a truck mounted attenuator shall be used on all interstate projects or on all roadways with an ADT greater than 20,000 and a pre-construction speed greater than or equal to 40 mph. This vehicle shall move with work operations not to exceed the roll-ahead distance required by the manufacturer plus 100 feet.
5. Advisory speed plaques (W13-1) shall be required if the difference between the speed limit prior to construction and the advisory speed (determined by an engineering study performed by the DTOE) is 10 mph or greater.

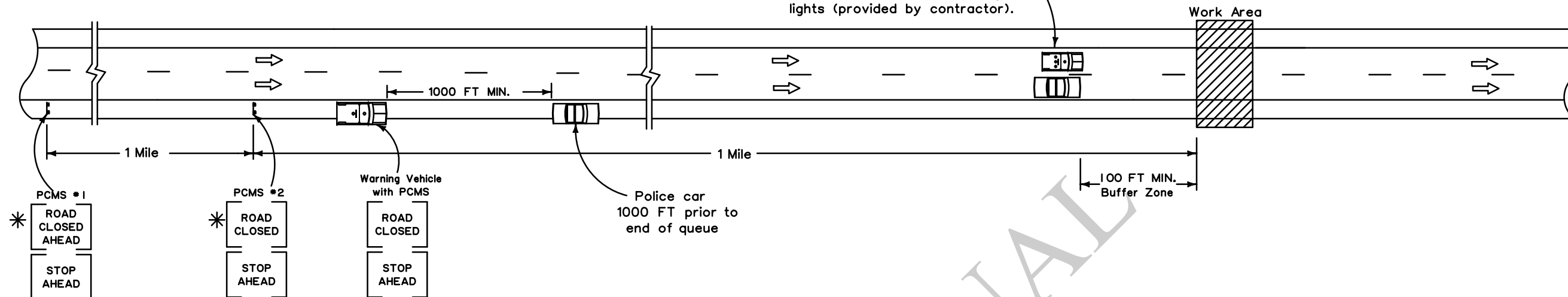
ALL TTC STANDARDS SHOW MINIMUM CONSTRUCTION SIGNING.
ALL SITUATIONS SHALL BE REVIEWED AND/OR DESIGNED BY THE ENGINEER.
CONTRACTORS ARE RESPONSIBLE FOR COMPLYING WITH ALL TTC STANDARDS.

LEGEND

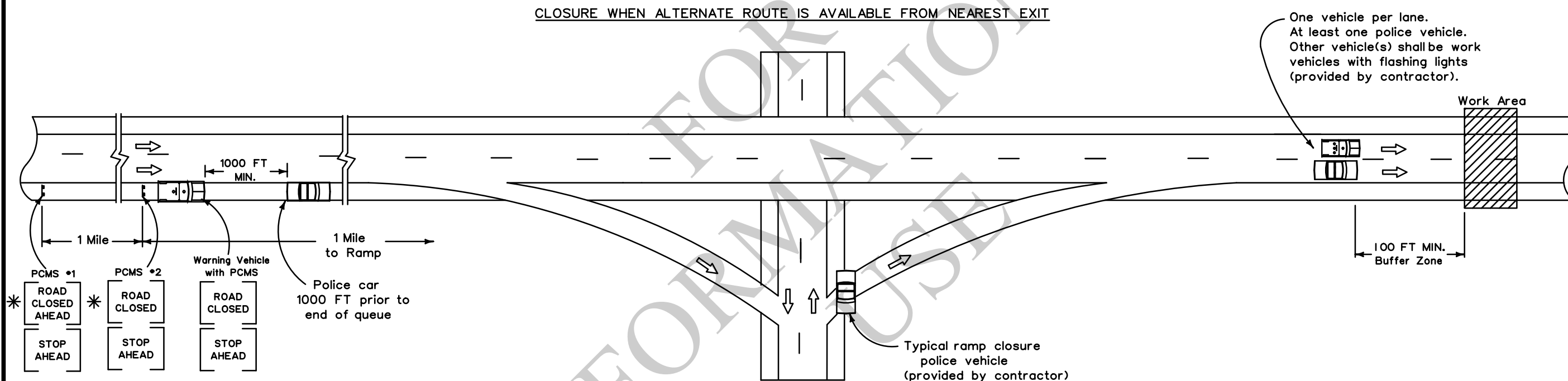
- Traffic Sign
- Channelizing Devices
- Type III Barricades
- Flashing Arrow Board (Type 'C')
- Work Area
- Type B Light
- Direction of Travel
- Truck with Green/Amber Light and TMA

SHEET NUMBER		PARISH		CONTROL SECTION		STATE PROJECT	
DESIGN		CHECK		DETAIL		REVIEW	
B. BOUCHER		M. RILOVICH					
APPROVED BY CHIEF ENGINEER				DATE		Feb. 7, 2025	
BRB		BY		CLARIFY TAPER LENGTHS AND MINOR CORRECTIONS		REVISION OR CHANGE ORDER DESCRIPTION	
4-3-24		DATE					
No.							
LOUISIANA DEPARTMENT OF TRANSPORTATION & DEVELOPMENT							
TRAFFIC ENGINEERING							

One vehicle per lane. At least one shall be a police vehicle. Other vehicle(s) shall be work vehicles with flashing lights (provided by contractor).



CLOSURE WHEN ALTERNATE ROUTE IS AVAILABLE FROM NEAREST EXIT



NOTES

This sheet shall be used with the Temporary Traffic Control General Notes Sheets TTC-00(A), TTC-00(B) and TTC-00(C).

1. This layout represents the minimum traffic controls required for short duration closure of divided highways.
2. This type of highway closure shall only be used for emergencies or for construction operations approved by the Engineer and when the duration of closure will not exceed 15 minutes. After the divided highway has been closed and reopened via this procedure a minimum period of 30 minutes or queue dissipation shall elapse before another short duration closure, except with the approval of the Engineer.

3. A minimum of two police officers and two police cars shall be provided on each approach to the closure. Each police car shall have a roof mounted rotation blue light or blue bar.
4. All workers involved in the closure shall maintain radio communications at all times.

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LEGEND

- | | |
|---|-------------------------------------|
|  | Direction of Travel |
|  | Police Car |
|  | Work Vehicle with Green/Amber Light |
|  | Warning Vehicle with PCMS |

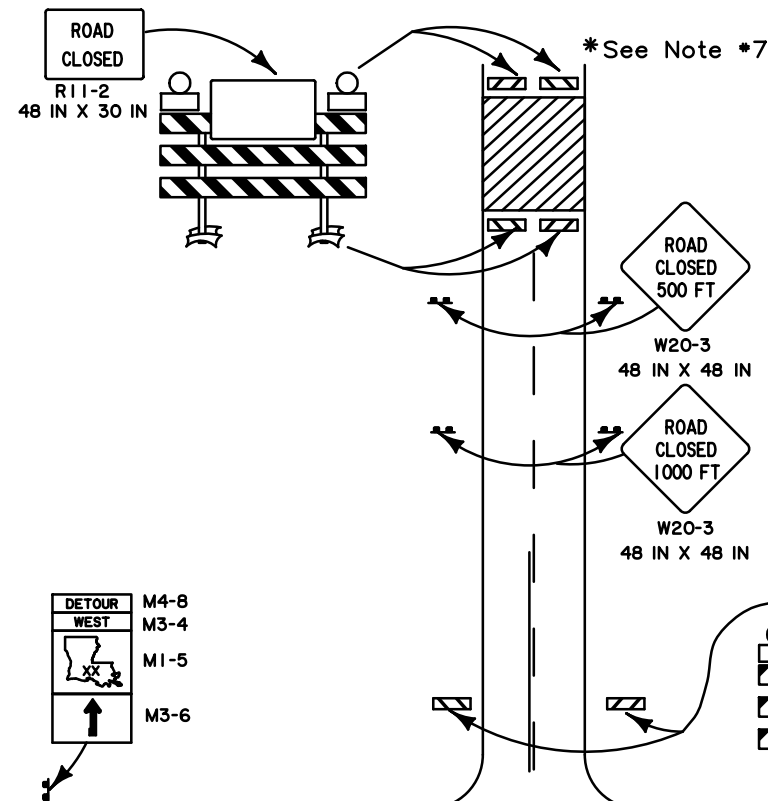
7 DAYS PRIOR TO ROAD CLOSURE

See Note #4 and #8

DURATION OF ROAD CLOSURE

See Note #4 and #8

ADVANCE WARNING SIGN DURING ROAD CLOSURE

BRIDGE
TO BE CLOSED
//_ TO _/_/_

OR

LA XX
TO BE CLOSED
//_ TO _/_/_Closure Message Sign
Black/Orange ColorBRIDGE
TO BE
CLOSED

OR

//_
TO
//_

PCMS

LA XX
TO BE
CLOSED_/_/_
TO
//_BRIDGE
CLOSED
DETOUR LA XX

OR

LA XX
CLOSED
DETOUR LA XXClosure Message Sign
Black/White ColorBRIDGE
CLOSED

OR

DETOUR
LA XX

PCMS

LA XX
CLOSEDDETOUR
LA XX

NOTES

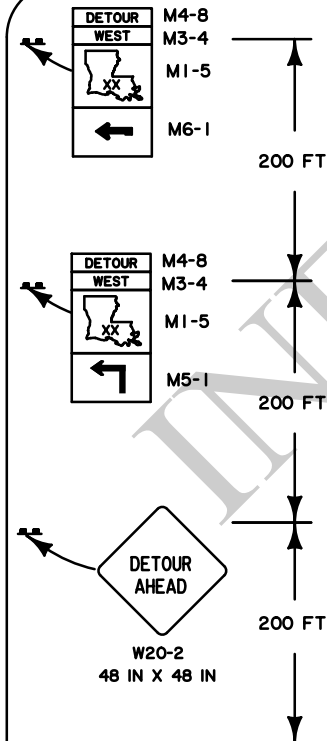
This sheet shall be used with the Temporary Traffic Control General Notes Sheets TTC-00(A), TTC-00(B) and TTC-00(C).

1. This layout represents the generic traffic controls required for road closure on a two-lane roadway. A specific detour plan with all required signs and routes is required for all detours.
2. Any signs in conflict with detour signing shall be removed or covered.
3. Closure Message Sign or PCMS shall be placed 7 days prior to road closure on all approaches to the closure. This sign shall be placed no farther than 50 FT from the work area to be closed.
4. Closure Message Sign or PCMS shall be placed on all approaches to the closure for the duration of the road closure. Minimum letter size on static signs shall be 8 inches.
5. Detour routes shall only be state-maintained routes, unless the project manager has made an agreement with the road owner.
6. Not all detour signs are shown. The DTOE shall approve all detours. The contractor shall be responsible for placing and maintaining all detour signs. There should be a sign at every decision point.
7. The signing is to be mirrored in the opposite direction.
8. PCMS shall be used in addition to the closure message sign on all highways with an ADT greater than 20,000. Place at a location approved by the Engineer.
9. A complete detour map shall be included with the set of plans. If there are changes in the routing, including changes that only affect truck traffic, then the contractor will need to submit them to the Engineer for approval.

(Place no more than 50 FT
from intersecting roadway.)

PCMS
(See
Note #8)

Closure
Message
Sign



EXAMPLE TRUCK DETOUR SIGN

(Use as Needed)

TRUCK
DETOUR
WEST
M4-4
M4-8
M3-4
M1-5
M5-1

LEGEND

⇒ Direction of Travel

⚡ Traffic Sign

Closure
Message
Sign

PCMS (See Note #8)

ALL TTC STANDARDS SHOW MINIMUM CONSTRUCTION SIGNING.
ALL SITUATIONS SHALL BE REVIEWED AND/OR DESIGNED BY THE ENGINEER.
CONTRACTORS ARE RESPONSIBLE FOR COMPLYING WITH ALL TTC STANDARDS.

SHEET NUMBER			
DESIGN	BY	PARISH	
CHECK	BY		
B. BOUCHER			
M. RILOVICH			
DETAIL	BY	CONTROL SECTION	
CHECK	BY		
REVIEW	BY	STATE PROJECT	
SERIES #	BY		

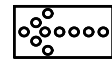
APPROVED BY CHIEF ENGINEER



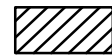
DATE:

Feb. 7, 2025

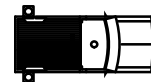
LEGEND



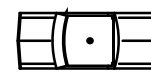
Flashing Arrow
Board (Type 'C')



Direction of Travel



Work Vehicle



Police Vehicle
with Flashing Lights

Work Vehicle
with flashing light mounted on top
and on outriggers and with
Type C96" X 48" arrow board

Second Protection Vehicle
Type C96" X 48" arrow board

Work Vehicle
with flashing light mounted on top
and on outriggers and with
Type C96" X 48" arrow board

Second Protection Vehicle
Type C96" X 48" arrow board

Police Vehicle
with flashing lights
for presence

First Protection Vehicle
Type C96" X 48" arrow board

Place on back
of truck so not
to obscure arrow

LANE
CLOSED

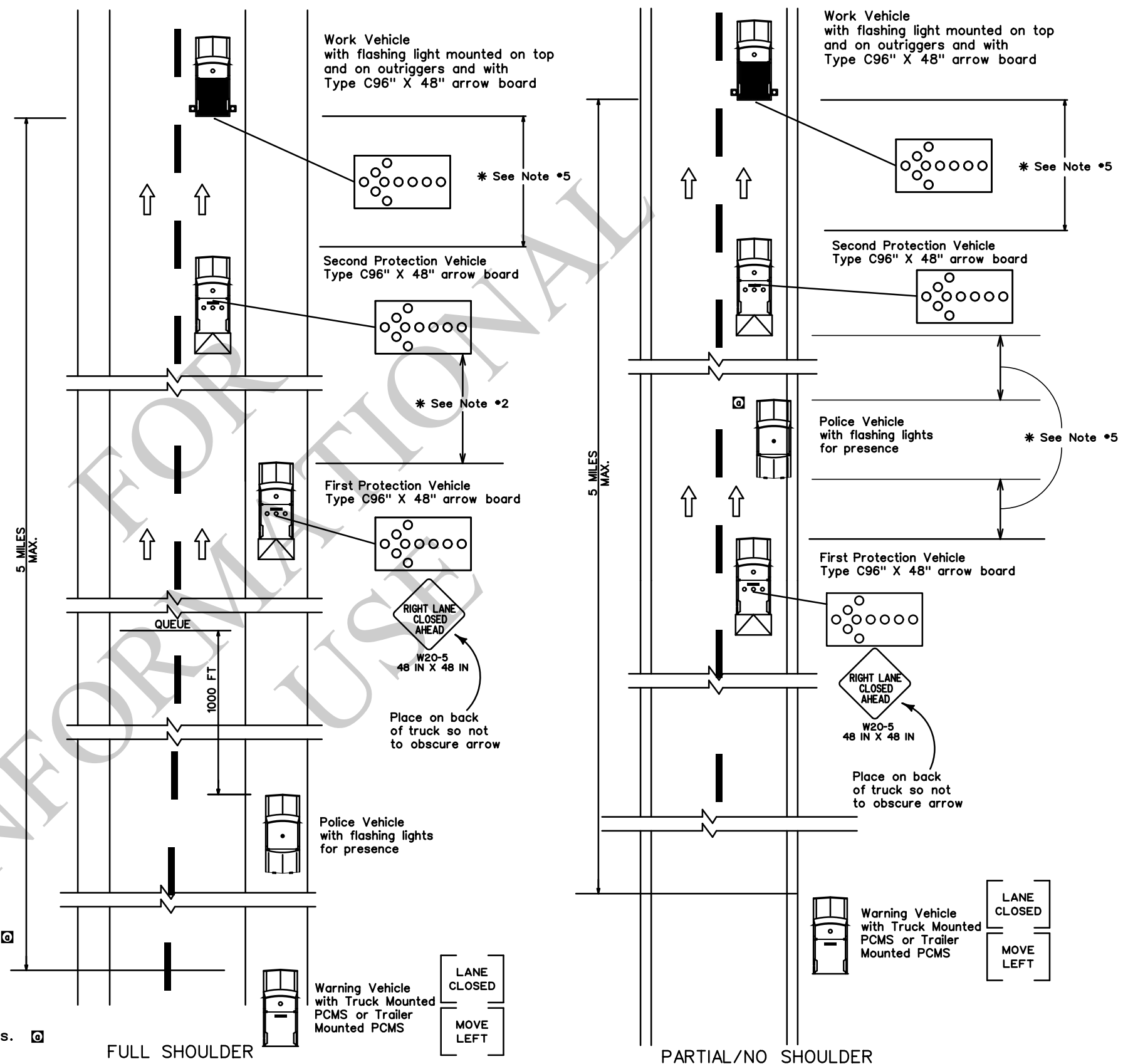
MOVE
LEFT

NOTES

This sheet shall be used with the Temporary Traffic Control General Notes Sheets TTC-00(A), TTC-00(B) and TTC-00(C).

1. This layout represents the minimum traffic controls required for moving operations, such as striping, street sweeping, etc., on interstates and multi-lane roadways. This layout shall not be used for placing signs or pavement legends along the roadway.
2. Distances between vehicles shall vary and should be adjusted due to drying time and sign obstructions such as overpasses and hills.
3. Striping operation is shown for the right lane. Left lane operation is the same, but opposite. If the roadway is greater than 2 lanes, a traffic control plan will be designed.
4. If a queue greater than 30 minutes (about 2 miles) exists, the contractor shall cease operations and pull over to the shoulder until the queue dissipates.
5. The protection vehicles shall be equipped with a flashing green/amber light and a truck mounted attenuator. This vehicle shall move with work operations not to exceed the roll-ahead distance required by the manufacturer plus 100 feet.
6. All construction vehicles with flashing lights shall use green/amber colors.

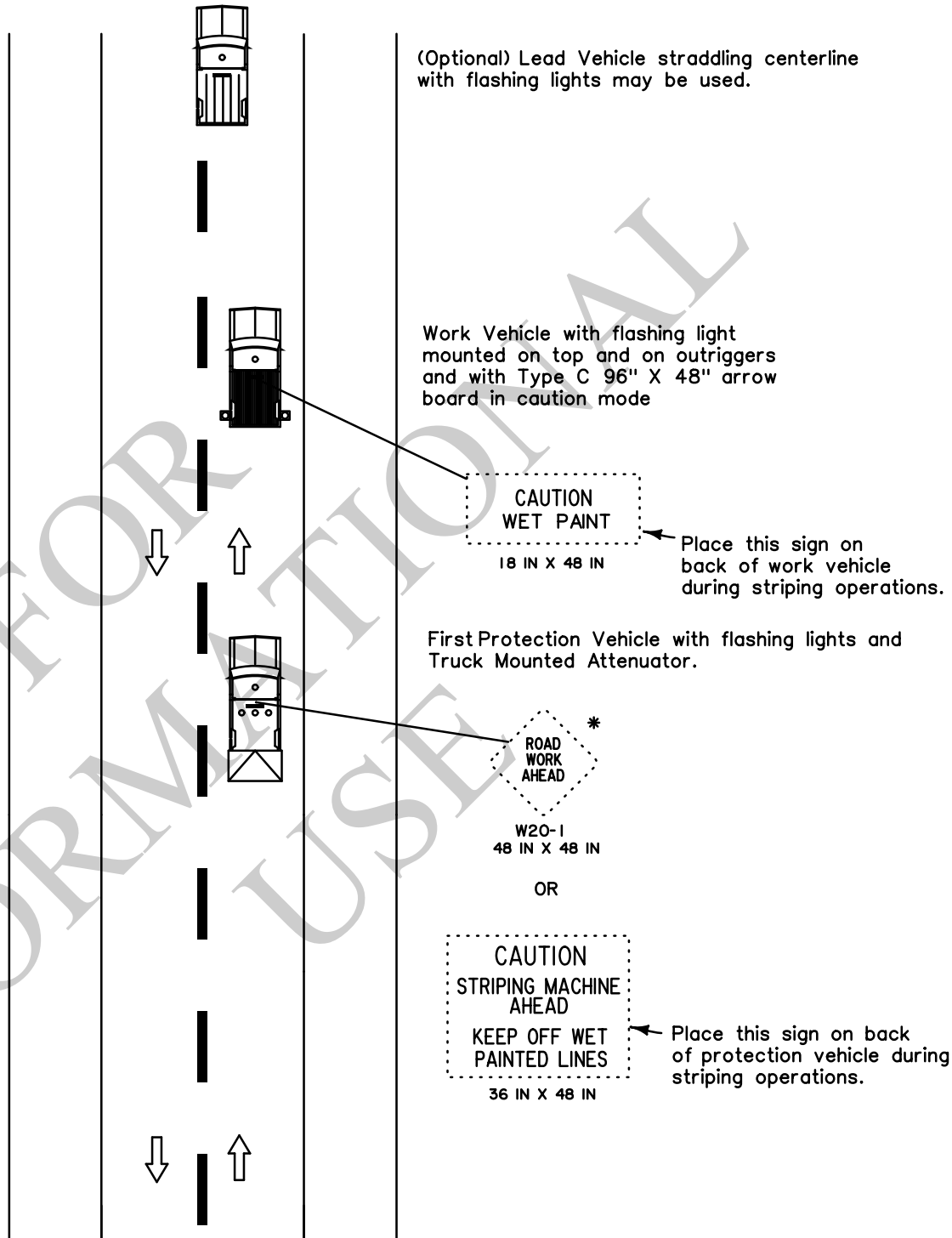
ALL TTC STANDARDS SHOW MINIMUM CONSTRUCTION SIGNING.
ALL SITUATIONS SHALL BE REVIEWED AND/OR DESIGNED BY THE ENGINEER.
CONTRACTORS ARE RESPONSIBLE FOR COMPLYING WITH ALL TTC STANDARDS.



NOTES

This sheet shall be used with the Temporary Traffic Control General Notes Sheets TTC-00(A), TTC-00(B), and TTC-00(C).

1. This layout represents the minimum traffic controls required for moving operations on two-lane roads with two-way traffic, such as striping, street sweeping, and placement of raised pavement markers.
2. Distances between vehicles may vary and should be adjusted due to drying time and sight obstructions such as overpasses and hills. Vehicles with attenuators shall move with work operations. Buffer space shall not exceed rollahead distance required by the manufacturer plus 100 feet.
3. If a queue greater than 5 minutes (about 1000 feet) exists, the contractor shall cease operations and pull over to the shoulder until the queue dissipates.
4. Flaggers may be used with this layout, if needed. See TTC-00(B).
5. All construction vehicles with flashing lights shall use green/amber colors. 



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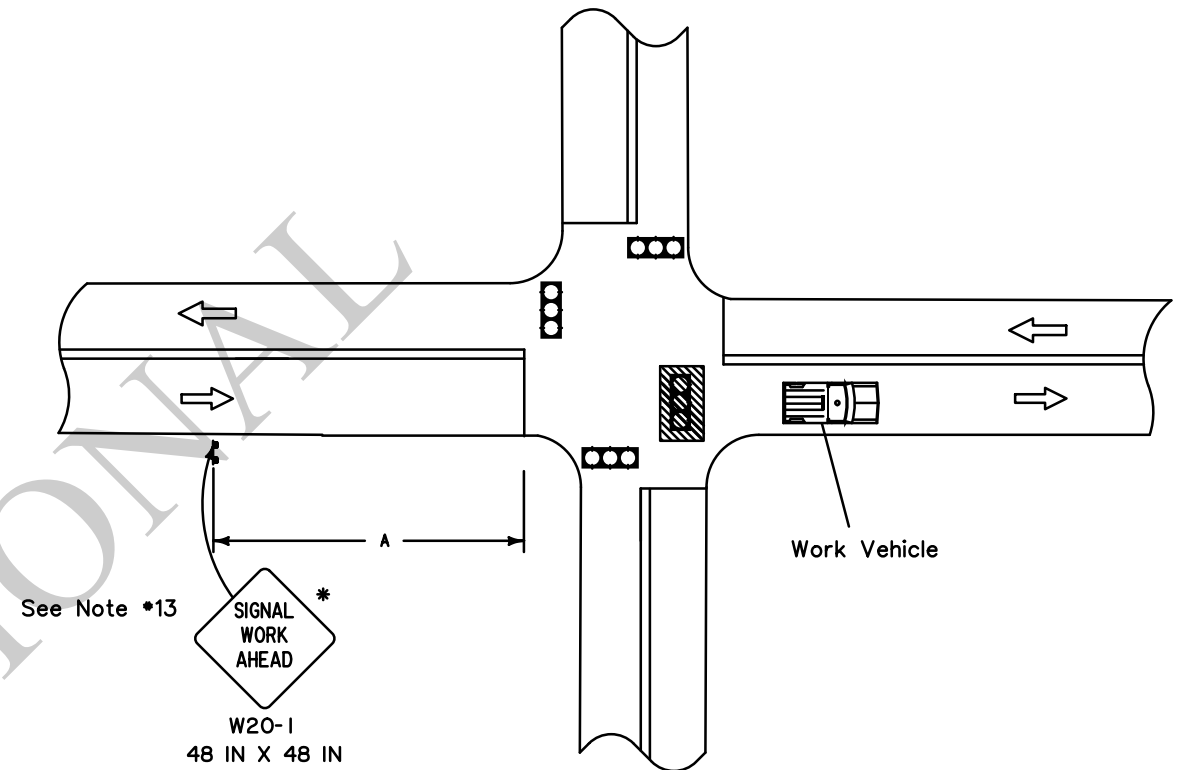
* Any sign of the W20-1 series may be used.

LEGEND

-  Direction of Travel
-  Work Vehicle
-  Lead Vehicle
-  Protection Vehicle

SHEET NUMBER		PARISH		CONTROL SECTION		STATE PROJECT					
DESIGN		CHECK		DETAIL		CHECK		REVIEW		SERIES *	
B. BOUCHER		M. RILOVICH									
APPROVED BY CHIEF ENGINEER											
										DATE: Feb. 7, 2025	
MINOR CORRECTIONS											
REVISION OR CHANGE ORDER DESCRIPTION											
4-3-24											
DATE											
NO.											
											
TEMPORARY TRAFFIC CONTROL FOR MOVING OPERATIONS ON TWO-WAY TWO-LANE ROADWAYS											
TTC-18											
											
LOUISIANA DEPARTMENT OF TRANSPORTATION & DEVELOPMENT											
TRAFFIC ENGINEERING											

SIGNAL WORK ON A TWO-LANE TWO-WAY ROADWAY



**** For posted speed over 45 mph, use TMA.**

SPEED LIMIT (prior to construction)	SPACING
	'A'
≤ 40 mph	125 FT
45-50 mph	350 FT
> 50 mph	500 FT

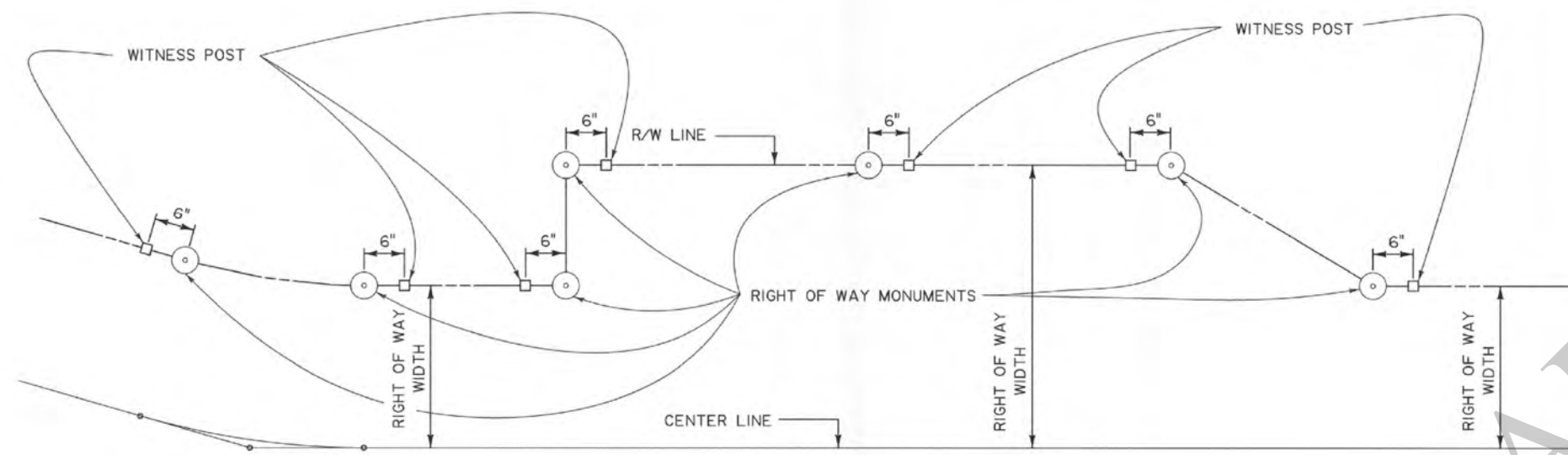
LEGEND

-  Traffic Sign
-  Work Vehicle
-  Truck with Flashing Arrow Panel
-  Work Area
-  Direction of Travel
-  Traffic Signal

This sheet shall be used with the Temporary Traffic Control General Notes Sheets TTC-00(A), TTC-00(B), and TTC-00(C).

1. This layout represents the minimum traffic controls required during signal construction and maintenance.
2. For projects with multiple signals, the contractor shall construct only one signal at a time.
3. If the signal at an intersection is turned off, the intersection may operate as a 4-way stop with approval by the Engineer and the DTOE. The contractor shall be responsible for installing and removing all stop signs at the intersection.
4. A detour plan is required if the road will be closed to through traffic at all approaches.
5. A uniformed police officer shall direct traffic for short duration lane closures and signal turn-ons.
6. The turn lane may be used as a through lane if a minimum 10-foot lateral clearance can be maintained and opposing traffic is not impeded.
7. A signal timing and phasing plan shall be developed for each phase of construction.
8. Place "Road Work Ahead" sign prior to an intersecting alternate route, no more than 1500 feet from the work area.
9. The sign height shall be at least 7 feet in business, commercial, and residential areas and also near parking, pedestrians, bicyclists, or other obstructions.
10. All work must be done during off-peak hours.
11. The contractor shall not work on both through lanes at the same time.
12. For signal work on a multi-lane roadway greater than 1 hour, see TTC-09 or TTC-10.
13. If the expected or actual queue length exceeds the distance in Table 2C-4 in the MUTCD, place an additional "Signal Work Ahead" sign (W20-1) at the end of the queue.
14. For two-lane two-way roadways, a police car with flashing lights and 2 police officers will be required for intersection traffic control.
15. Left turn lanes shall be closed whenever work is being performed in path of left hand turner.
16. Position of work vehicle may vary according to work required.

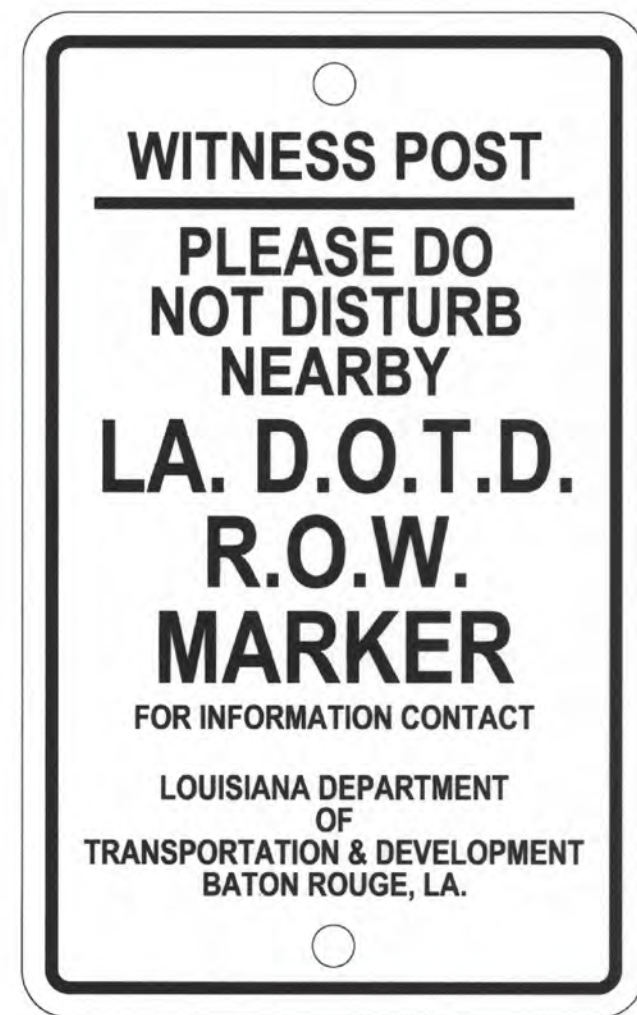
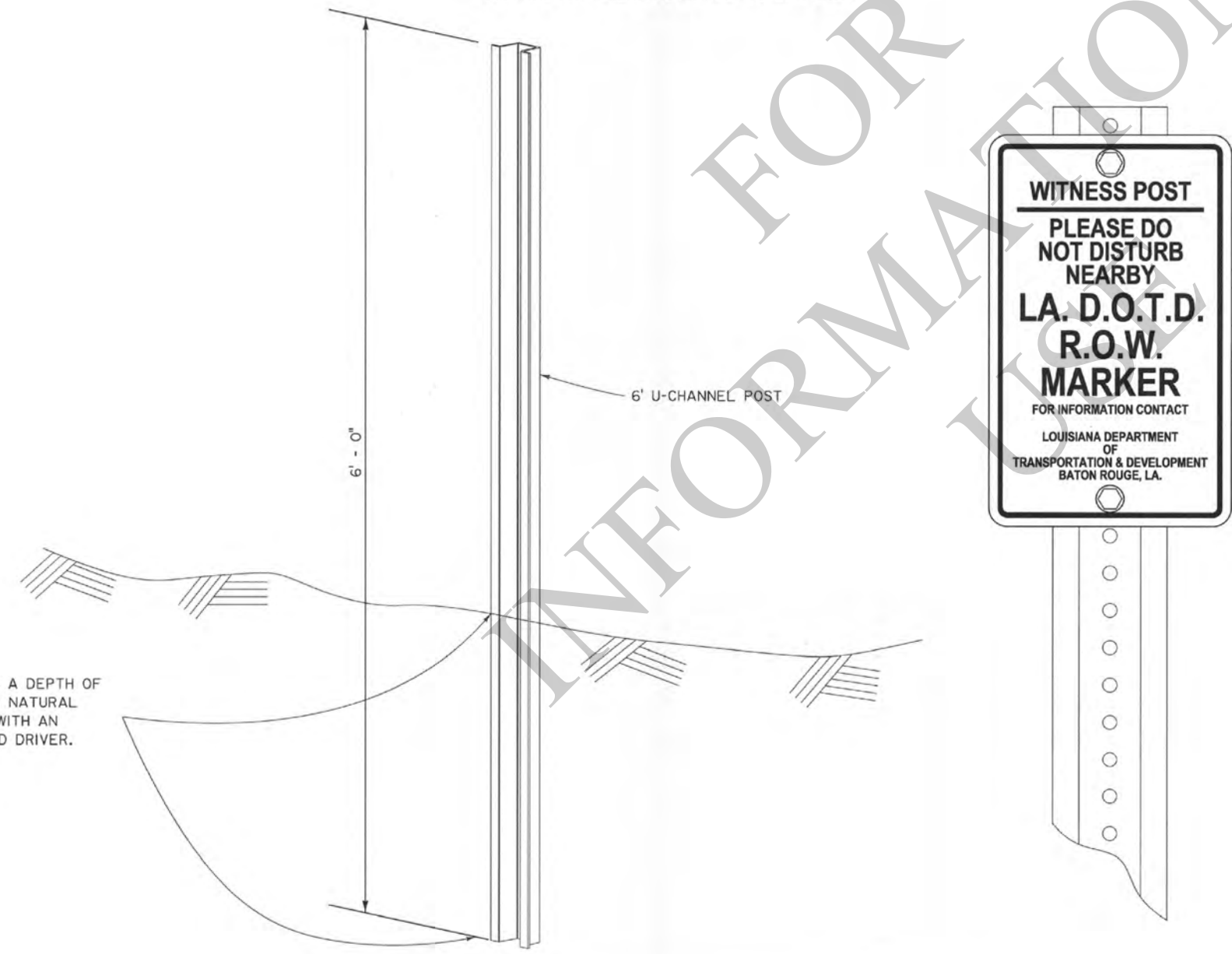
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STANDARD RIGHT OF WAY MONUMENT
WITNESS POST
PLAN SHOWING WHERE POSTS ARE TO BE PLACED

WITNESS POST SHALL CONSIST OF A U-CHANNEL POST AND RIGHT OF WAY MARKER SIGN DESCRIBED FURTHER AS A HEAVY DUTY GALVANIZED U-CHANNEL POST WEIGHING APPROXIMATELY 2 POUNDS PER FOOT, BEING 6 FOOT IN LENGTH, WITH 3/8 INCH BOLT HOLES SPACED 1 INCH APART ALONG THE LENGTH OF THE POST. THE SIGN SHALL BE MADE OF ALUMINUM WITH A THICKNESS OF 1/16 INCH, MEASURING 6 1/2 INCHES BY 10 1/2 INCHES WITH A DURABLE DECAL AND HAVING 2 BOLT HOLES, SPACED 9 INCHES APART, TO ACCOMMODATE A 3/8 INCH BOLT. THE POST AND SIGN MUST MEET THE STANDARDS AS SHOWN ON THE PLANS OR AN APPROVED EQUAL. SUBSTITUTIONS MUST BE APPROVED BY THE LOCATION AND SURVEY SECTION ADMINISTRATOR, BATON ROUGE, LOUISIANA.

THE SIGN SHALL BE FASTENED TO THE POST USING EITHER GALVANIZED OR STAINLESS STEEL BOLTS, NUTS AND WASHERS, WITH SAID BOLT BEING 3/8 INCH DIAMETER AND LONG ENOUGH TO PROTRUDE 1/2 INCH OR LONGER BEYOND THE REAR OF THE POST.



SHEET NUMBER	
PARISH	CONTROL SECTION
DESIGN	CHECK
DATE	2/1/2021
APPROVED BY CHIEF ENGINEER	
Christy P. Harts	
DATE: 2/1/2021	
RIGHT OF WAY MONUMENT WITNESS POST	
WP-01	
DOTD	
LOUISIANA DEPARTMENT OF TRANSPORTATION & DEVELOPMENT	
LOCATION AND SURVEY	