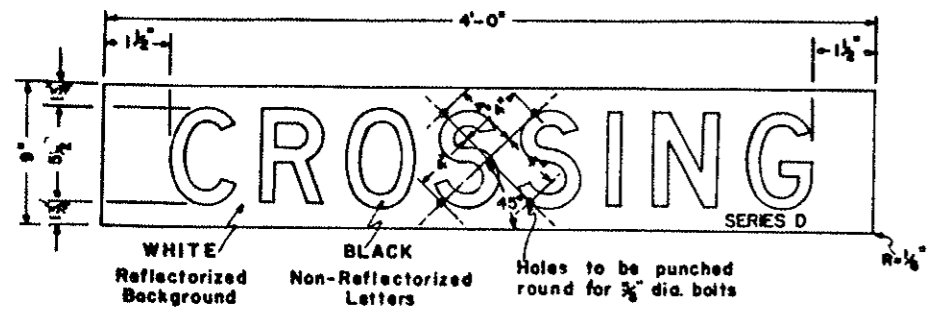
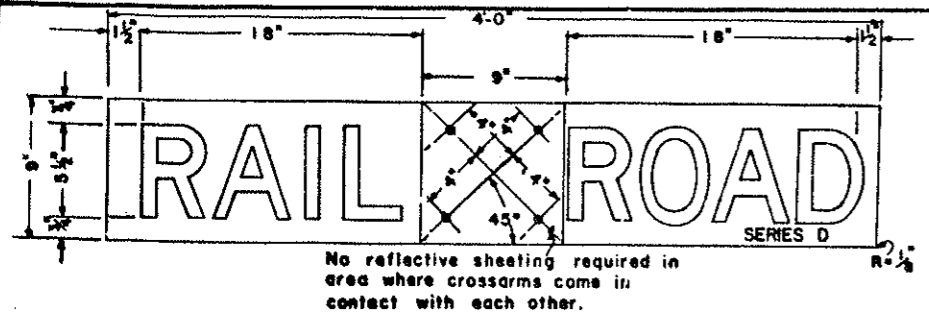
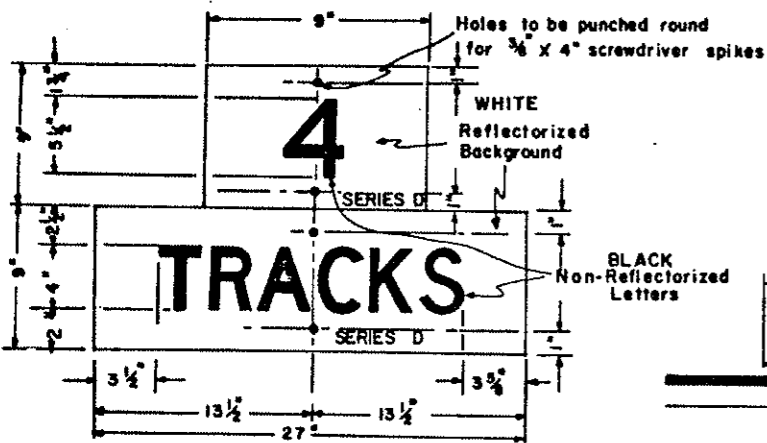


# RAILROAD CROSSING AND ADVANCE WARNING SIGNS

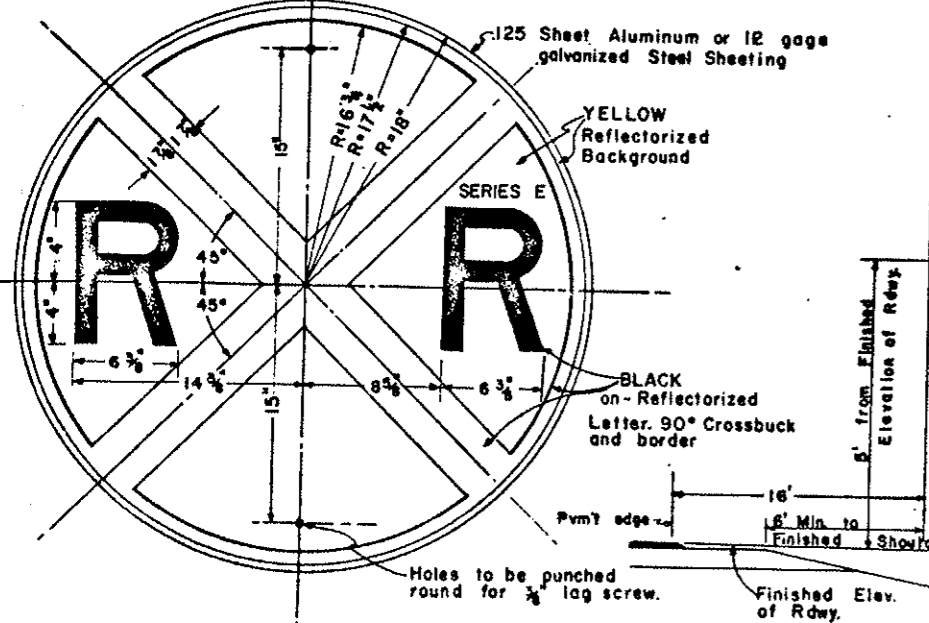


90° REFLECTORIZED CROSSING SIGN LAYOUT

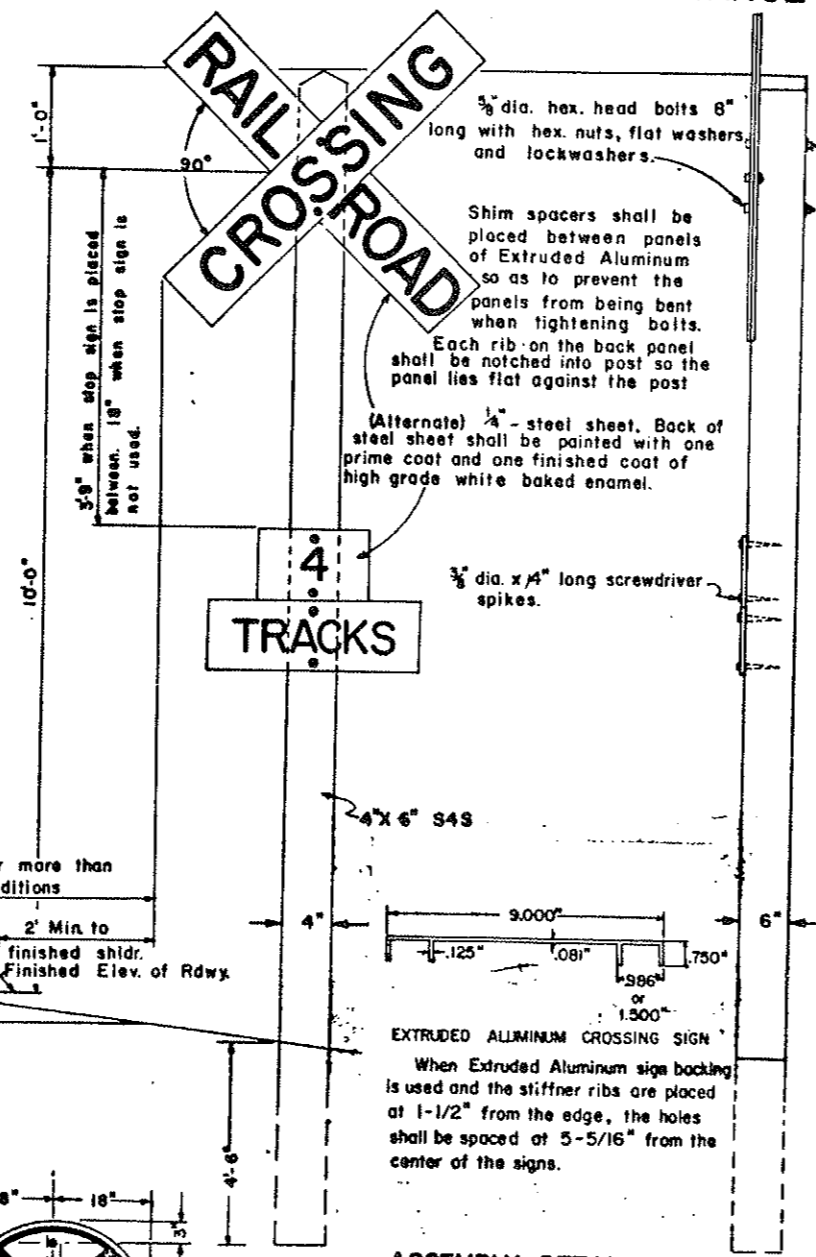


CK NUMBER SIGN LAYOUT

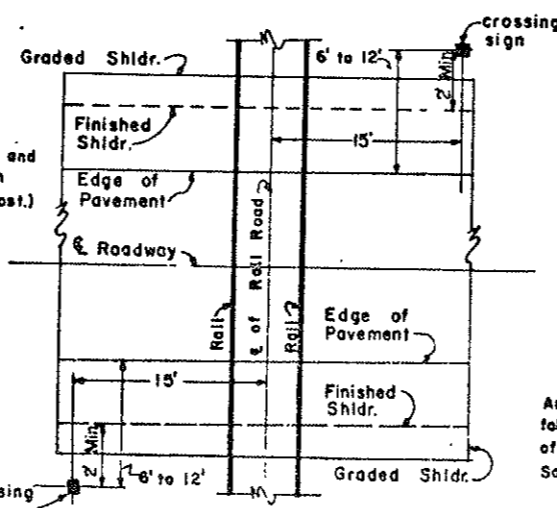
Note: Track number sign to be made from .081 Aluminum Sheeting or 15 gage galvanized steel sheeting



REFLECTORIZED ADVANCE WARNING SIGN  
 Message to be screened on reflective sheeting

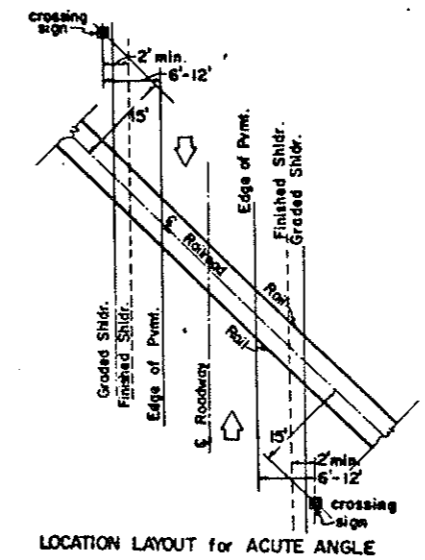


ASSEMBLY DETAIL OF 90° REFLECTORIZED CROSSING SIGN

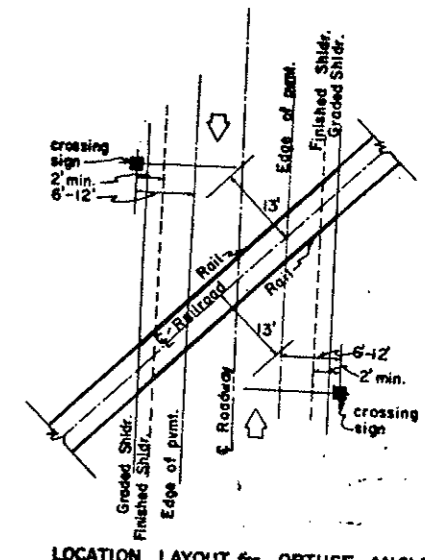


PLAN LOCATION LAYOUT

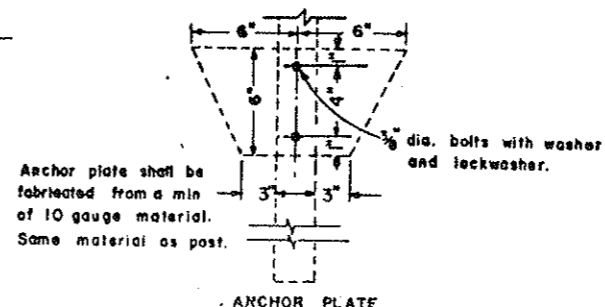
**NOTES:**  
**LOCATION:** The advance warning sign in rural areas shall normally be placed about 750 feet in advance of the crossing sign. On high speed roads, and particularly on expressways or freeways, the distance may have to be as great as 1500 feet or more. Where speeds are relatively low in urban areas, the distance should be only about 250 feet.  
**TRACK NUMBER SIGN:** Signs indicating the number of tracks shall be used where there are two or more tracks. The number displayed shall be the number crossed. Sign backing shall be aluminum alloy as specified for Advance Warning Sign.  
**ADDITIONAL CROSSING SIGNS:** The distance that shall be assumed to separate tracks before an additional sign is considered necessary shall be 100 feet.  
**ADVANCE WARNING SIGN:** This sign backing shall conform to the requirements of Section 894-2.2 of the Standard Specifications.  
**CROSSING SIGN:** This sign backing shall be steel sheeting conforming to A.S.T.M. Designation A-366 or Extruded aluminum with stiffener ribs as placed as to provide resistance to bending under an assumed wind load of 40 pounds per square foot, .081 thick through the face, and shall conform to A.S.T.M. Designation B 221 (AA 6063-T6)  
**SIGN SUPPORTS:** 90° ReflectORIZED crossing sign support shall be No. 1 pine, fir spruce, cedar, western larch, aspen, American elm, or oak surfaced on four sides and shall comply with the Standard Grading Rules of the American Lumber Standards, and shall be free of heart centers. Paint by dipping, spraying, or brushing two (2) coats of white or aluminum paint. Bolt holes should be drilled before painting. ReflectORIZED Advance Warning Sign support shall be perforated telescoping tubing conforming to section 894-6.6 of the Standard Specifications.  
**PAINTING:** All painting on all signs and posts shall conform to the applicable provisions of Section 718 and Section 870 of the Standard Specification.  
**SIGN FABRICATION:** Sign backing material shall conform to the requirements of Section 894-1 of the Standard Specifications. Sign faces shall be fabricated in conformance to the requirements of Section 894-2 of the Standard Specifications. The reflective sheeting shall be encapsulated lens conforming to the requirements of Section 894-3.4.2 of the Standards Specifications.  
**SCREENED SIGN:** Message and border shall be screened on reflective sheeting in a manner specified by the manufacturer of the reflective material and followed by a full glossy coat of finishing clear.  
**LETTERS:** The contractor may choose either to screen the message on the Crossing and Track No. Sign or apply non-reflective plastic film letters.  
**PIGMENTED PLASTIC FILM, PRESSURE SENSITIVE ADHESIVE:** The plastic film shall conform to the requirements of Section 894-3.5. INSTALLATION: Sign supports shall be installed in accordance with Section 754 of the Standard Specifications.  
**TREATMENT OF POSTS:** Posts shall be treated. Treatment shall conform to Section 866 of the Standard Specifications. Treated wood shall be paintable within 14 days after treatment. If pentachlorophenol treatment is used, a light petroleum solvent as specified in A.A.S.H.O. Designation 133 shall be used with pentachlorophenol.



LOCATION LAYOUT for ACUTE ANGLE



LOCATION LAYOUT for OBTUSE ANGLE



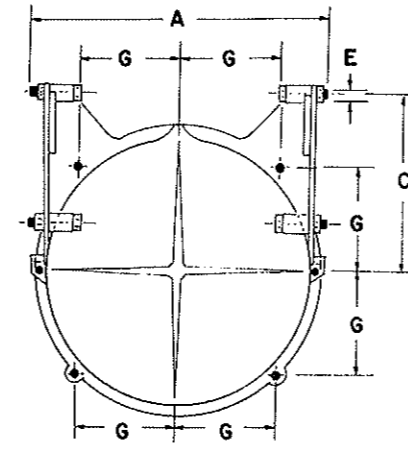
ANCHOR PLATE

1-1-75		NORTH DAKOTA STATE HIGHWAY DEPARTMENT	
REVISIONS		Submitted: <i>[Signature]</i>	
DATE	CHANGES	Recommended: <i>[Signature]</i>	
7-16-76	Specification Change	Asst. Chief Engineer	
5-3-77	Section No. Change	Pl. Const.	
1-18-79	Change Post Size		
1-30-79	Location Layouts Added		
4-17-79	Note Change		
6-20-79	Anchor Sleeve		

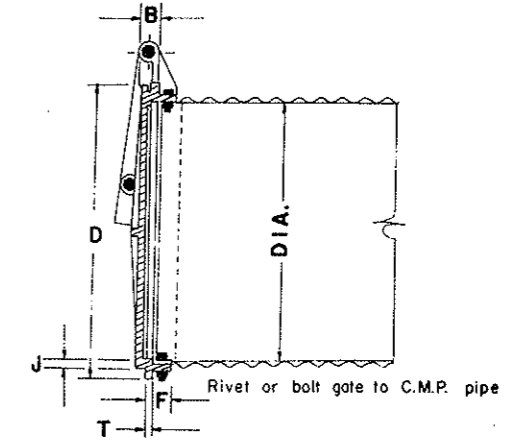
# FLAP GATE DETAILS

FED. ROAD DIV. NO.	STATE	FED. AID PROJECT NO.	SHEET NO.
8	N.D.	M-1-988(02)	66

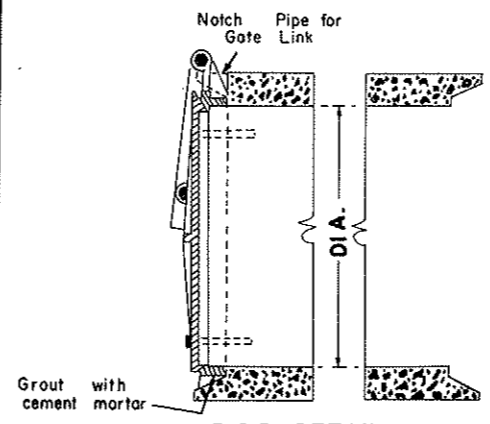
D-900-16



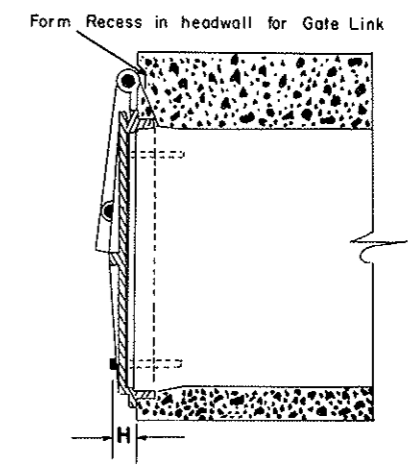
FRONT VIEW



C.M.P. DETAIL



R.C.P. DETAIL



CONC. HEADWALL DETAIL

### NOTES

- BASIS OF PAYMENT:** Flap gates can be bid at a price per gate or can be included in the price bid for culverts or headwalls. (See plans.)
- FLAP GATES:** Where head of water does not exceed 10', flap gates shall be grey iron in accordance with Sec. 848-3 of the standard specifications for heads over 10' and up to 50' flap gates shall be of steel casting in accordance with Sec. 848-2 of the standard specifications.
- FITTINGS:** Bushing, bolts, and hinge pins shall be of bronze or brass in accordance with Sec. 848-6 of the standard specifications.
- ANCHOR BOLTS:** Anchor bolts shall be 6" minimum in length with nut and lockwasher and pre-set in concrete headwall or reinforced concrete pipe culvert. Diameter of bolt shall correspond to bolt holes in the flap gate frames.

All Dimensions shown in Inches

DIA.	A	B	C	D	E	F	G	H	J	T
18	22 1/4	2	12 1/8	21	3/4	1 1/8	7 7/16	1 3/4	5/16	9/16
21	25 1/4	2	14 1/8	24 1/4	3/4	1 3/8	8 3/16	1 3/4	5/16	9/16
24	28 1/4	2	17	27 1/2	3/4	1 1/2	9 3/4	1 3/4	5/16	9/16
30	35 1/4	2 1/2	20 1/2	34	1	1 1/2	12	2	1 1/16	5/8
36	41 1/2	2 1/2	25	40 1/2	1	2 1/8	14 7/16	2 1/4	1 1/8	5/8
42	47 1/2	2 1/2	29 3/4	47	1	2 3/16	16 3/8	2 1/4	1 1/8	5/8
48	53 1/2	2 1/2	34	54	1	2 3/8	19 1/16	2 1/4	1 3/8	5/8
54	60 3/4	2 1/2	38	62 1/4	1 1/4	2 3/4	22	3	1 1/2	5/8
60	67	2 1/2	42	68 1/2	1 1/4	2 3/4	24 1/2	3	1 1/2	5/8
66	73 3/8	2 1/2	47	75	1 1/4	2 3/4	26 1/2	3	1 1/2	1
72	79	2 1/2	51	82	1 1/4	3	29	3	1 1/2	1
78	86	2 1/2	55 1/4	88 3/4	1 1/4	3 1/2	31 3/4	3	1 3/8	1 1/8
84	92 1/2	3 1/2	59 1/4	95 1/2	1 1/2	3 1/2	33 3/4	3	1 3/4	1 1/4
90	99	3 1/2	64	102 1/4	1 3/4	4	36 3/4	3 1/4	1 3/8	1 1/4

4.21

1-1-75		NORTH DAKOTA STATE HIGHWAY DEPARTMENT
REVISIONS		
DATE	CHANGE	Submitted: <i>[Signature]</i> Design Engineer
		Recommended: _____ Asst. Chief Engineer Pre-Construction
		Approved: <i>[Signature]</i> Chief Engineer