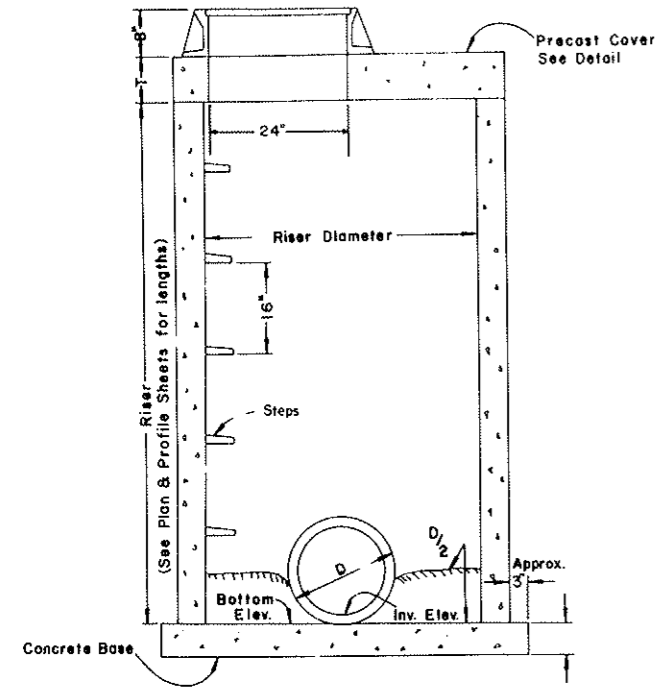
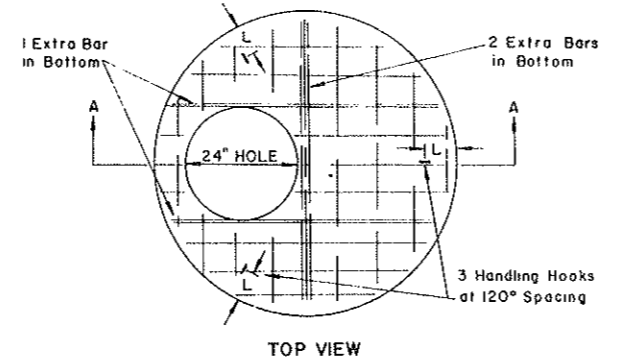


MANHOLE DETAILS

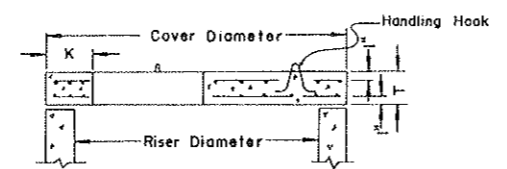
8	N.D.	M-1-98A(07)	51
			D-714-2



MANHOLE



TOP VIEW



SECTION A-A
PRECAST COVER

PRECAST MANHOLE COVERS						
PIPE DIAMETER	COVER DIAMETER	WEIGHT OF SECTION	T	K	L	BOTTOM BARS
42"	51"	800#	6"	6"	7"	#4 AT 6"
48"	58"	1110#	6"	6"	8"	#4 AT 6"
54"	65"	1950#	8"	6"	8"	#4 AT 6"
60"	72"	2470#	8"	7"	9"	#4 AT 6"
66"	79"	3050#	8"	7"	9"	#4 AT 6"
72"	86"	3680#	8"	7"	10"	#4 AT 6"
78"	93"	4360#	8"	8"	10"	#4 AT 4"
84"	100"	5100#	8"	9"	11"	#4 AT 4"
90"	107"	5890#	8"	9"	11"	#4 AT 4"
96"	114"	6730#	8"	9"	11"	#4 AT 4"
102"	121"	7630#	8"	9"	12"	#4 AT 4"
108"	128"	12460#	12"	10"	12"	#4 AT 4"
120"	140"	15500#	12"	11"	13"	#4 AT 4"

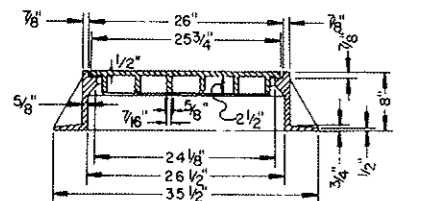
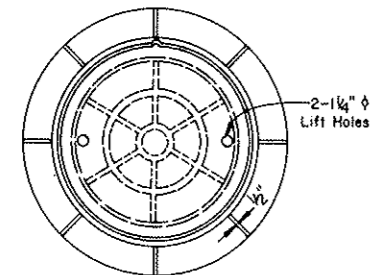
Top and Bottom Bars run in both directions

PRECAST MANHOLE BASES			
PIPE DIAMETER	BASE DIAMETER	WEIGHT OF SECTION	A BARS
42"	58"	1380#	6" #3 AT 6"
48"	66"	1780#	6" #3 AT 6"
54"	72"	2120#	6" #3 AT 6"
60"	79"	3410#	8" #3 AT 8"
66"	87"	4130#	8" #3 AT 8"
72"	94"	4820#	8" #3 AT 8"
78"	101"	5570#	8" #3 AT 8"
84"	108"	6370#	8" #3 AT 8"
90"	115"	7220#	8" #3 AT 8"
96"	122"	8130#	8" #3 AT 8"
102"	129"	9080#	8" #3 AT 8"
108"	136"	15130#	12" #3 AT 8"
120"	149"	18170#	12" #3 AT 8"

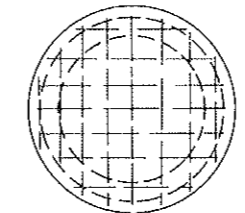
NOTE: METHOD OF MEASUREMENT FOR MANHOLES SHALL BE AS FOLLOWS: THE CONTRACT UNIT PRICE BID FOR MANHOLES SHALL INCLUDE THE FURNISHING AND INSTALLING THE FOLLOWING:

1. CAST IRON RING AND COVER.
2. PRECAST COVER.
3. CONCRETE BASE

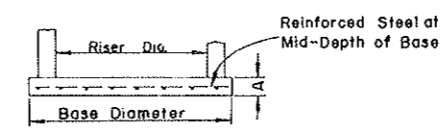
THE ITEM "MANHOLE RISER" SHALL INCLUDE THE FURNISHING & INSTALLING OF THE REQUIRED LENGTH OF RISER & CAST IRON STEPS.



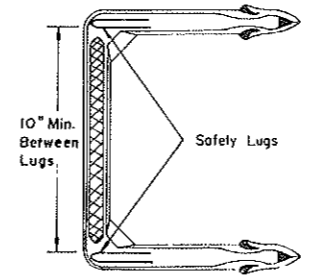
MANHOLE CAST IRON RING & COVER



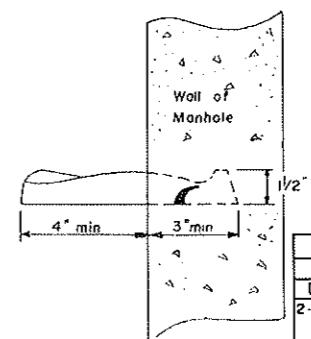
TOP VIEW



PRECAST MANHOLE BASE



STEP DETAIL



Notes:

Bottoms of manholes shall be cut or precast square to fit the base. Grout joint between base and wall with cement mortar.

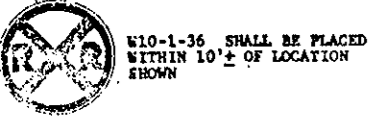
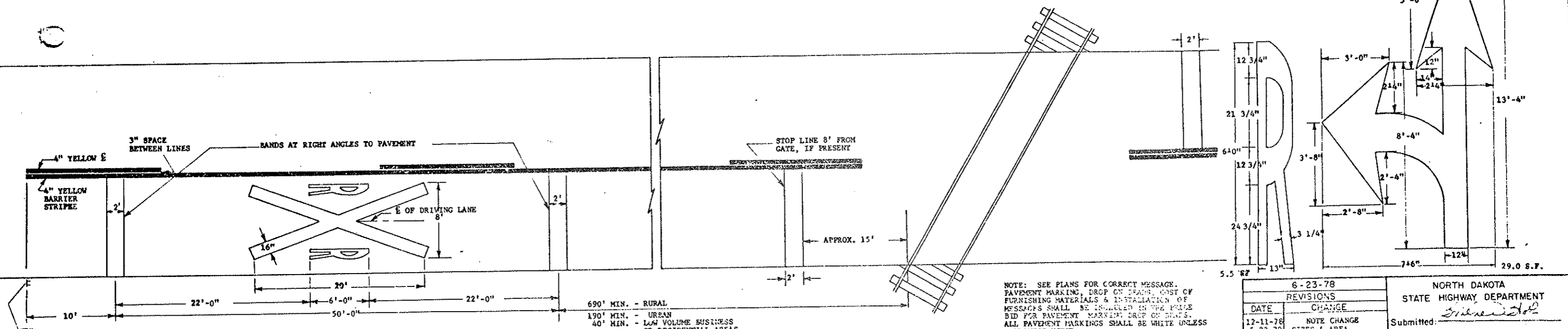
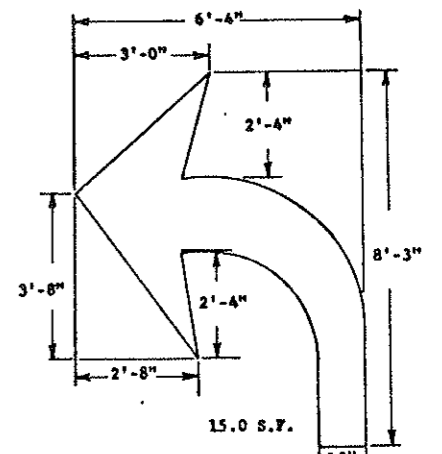
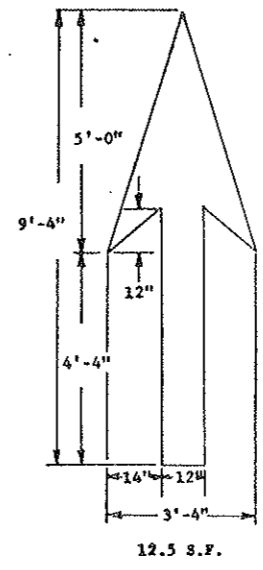
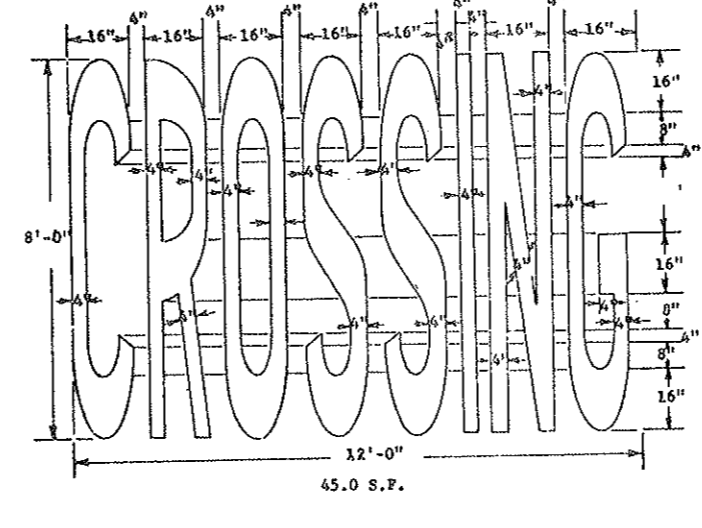
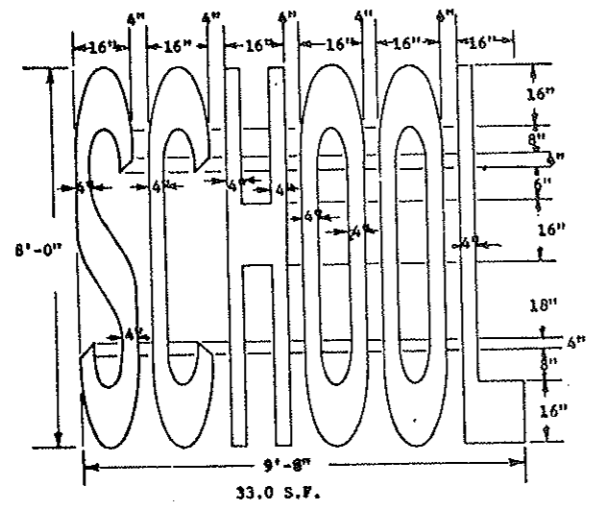
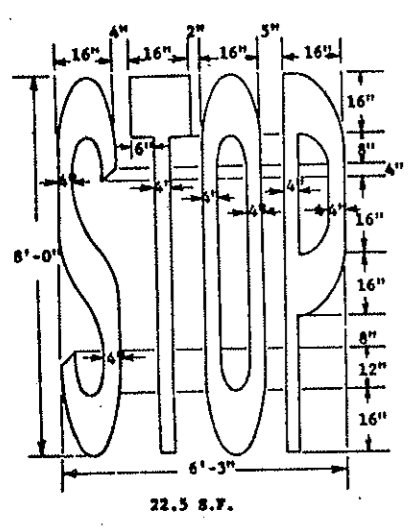
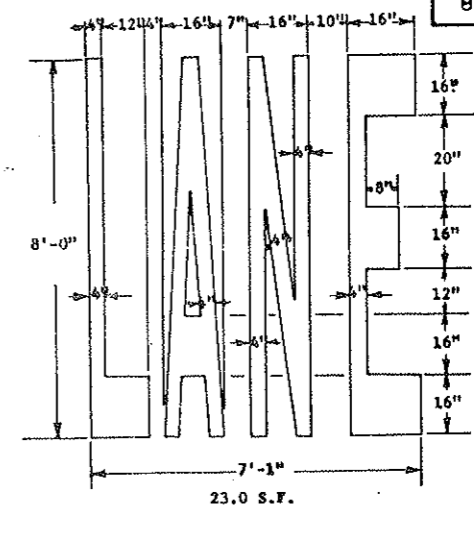
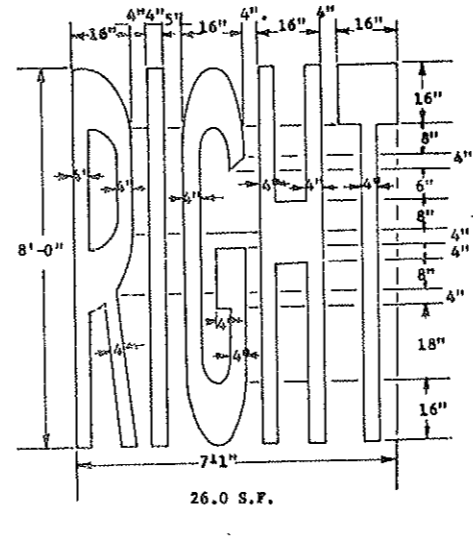
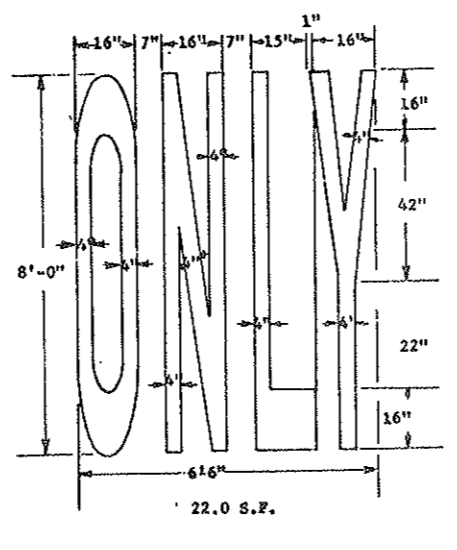
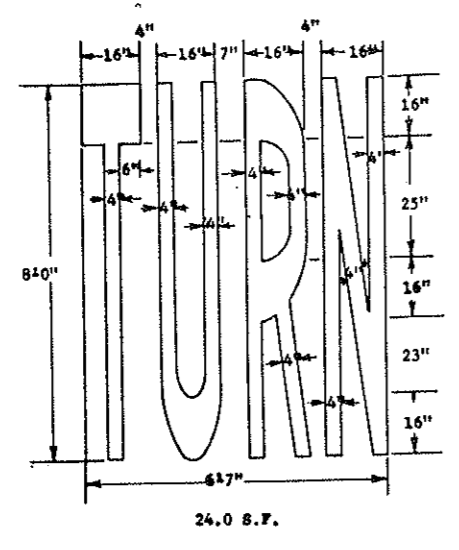
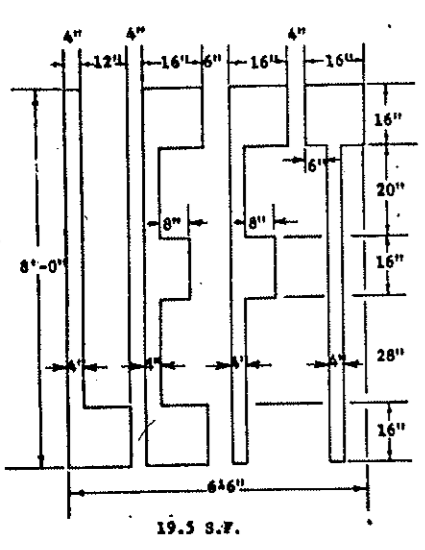
The Contractor may, if he so desires, construct the manholes lower than plan grade and bring the casting to grade using precast adjusting rings in a manner satisfactory to the Engineer in the field.

The Contractor shall have the option of using precast or poured in place bases.

Precast bases shall be reinforced as shown in listing for each size base. The class of concrete used in poured bases shall be class AE. The aggregate size shall be approved by the engineer.

Precast barrels shall be constructed in accordance with ASTM 478. Other castings, similar in dimension, may be used if accepted by the engineer in writing. Manhole steps shall be made of non-corrosive materials. The steps shall be certified capable of withstanding a minimum static load of 1500 pounds. Configuration of the steps shall be approved by the engineer. Manhole riser shall be produced in accordance with ASTM 478.

12-22-75		NORTH DAKOTA STATE HIGHWAY DEPARTMENT	
DATE	REVISIONS	Submitted:	Design Engineer
2-24-76	Step Dimensions	<i>[Signature]</i>	
		Recommended:	Asst. Chief Engineer Pre-Construction
		Approved:	<i>[Signature]</i> Chief Engineer



W10-1-36 SHALL BE PLACED WITHIN 10'± OF LOCATION SHOWN

A THREE LANE ROADWAY SHOULD BE MARKED WITH A CENTERLINE FOR TWO-LANE APPROACH OPERATION ON THE APPROACH TO A CROSSING. ON MULTI-LANE ROADS THE TRANSVERSE BANDS SHOULD EXTEND ACROSS ALL APPROACH LANES, AND INDIVIDUAL R & R SYMBOLS SHOULD BE USED IN EACH APPROACH LANE.

RAILROAD CROSS & 2 R'S 65.0 S.F.
3 BANDS 72.0 S.F.

690' MIN. - RURAL
190' MIN. - URBAN
40' MIN. - LOW VOLUME BUSINESS OR RESIDENTIAL AREAS

NOTE: SEE PLANS FOR CORRECT MESSAGE. PAVEMENT MARKING, DROP OF GRADE, COST OF FURNISHING MATERIALS & INSTALLATION OF MESSAGE SHALL BE INCLUDED IN THE PRICE BID FOR PAVEMENT MARKING, DROP OF GRADE. ALL PAVEMENT MARKINGS SHALL BE WHITE UNLESS OTHERWISE NOTED.

REVISIONS	
DATE	CHANGE
12-11-78	NOTE CHANGE
5-23-79	SIZES & AREA
6-20-79	Note Added
6-29-79	DIMENSIONS

NORTH DAKOTA STATE HIGHWAY DEPARTMENT

Submitted: *[Signature]*

Recommended: *[Signature]*
Asst. Chief Engineer, Pre-Const.

Approved: *[Signature]*
Chief Engineer