

GOVERNING SPECIFICATIONS:
Standard Specifications adopted by the North Dakota State Highway department July 1971, and approved as standard by the Federal Highway Admin. Sept. 29, 1971. Required Contract Provision (Form PR-1273) dated Apr. 1974 and others submitted herewith.



SCALES { LAYOUT SHEET: 1" = 5280 FT.
PLAN AND { HOR. 1" = 100 FT.
PROFILE DRAWINGS { VERT. 1" = 10 FT.
STRUCTURAL DRAWINGS: AS SHOWN
CROSS SECTION SHEETS: 1" = 10 FT.

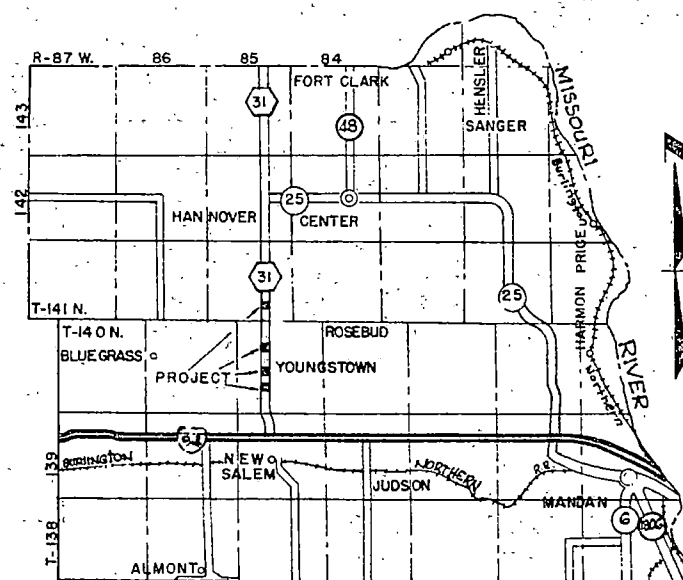
PLANS

FOR THE PROPOSED IMPROVEMENT OF A
STATE HIGHWAY
IN OLIVER & MORTON COUNTIES.

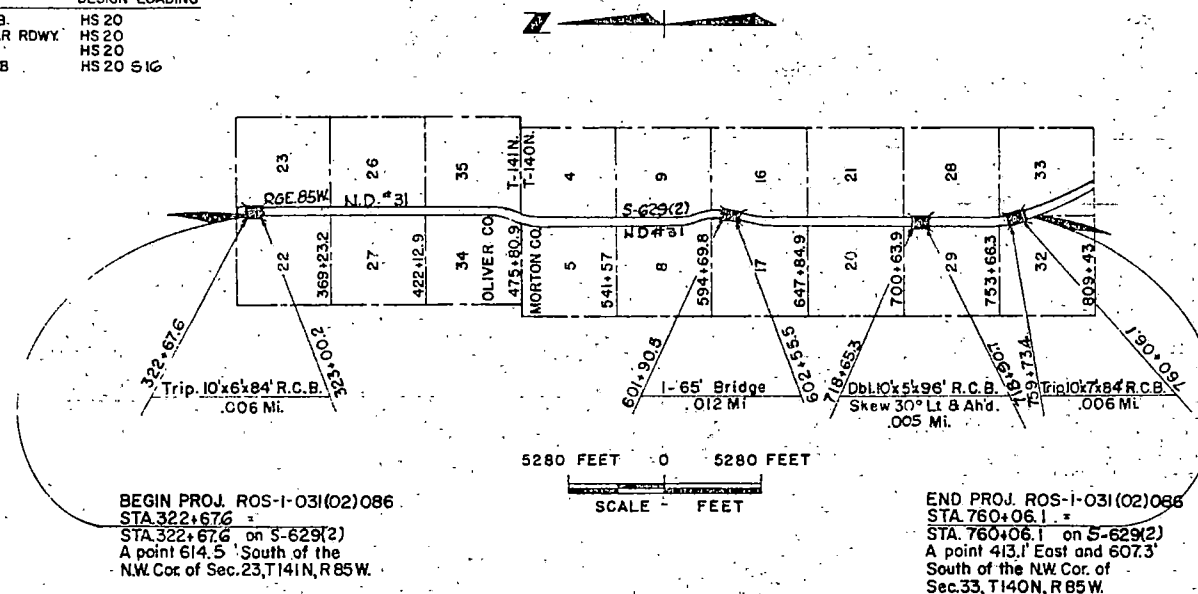
FEDERAL AID PROJECT NO. ROS-I-031(02)086
STRUCTURAL & INCIDENTALS

LENGTH OF PROJECT		
PROJECT	MILES-GROSS	MILES-NET
ROS-1-031(02)066	8.283	.029
TOTALS	8.283	.029

TRAFFIC	AVERAGE DAILY		EST. 30TH MAX. HR.
CURRENT TRAFFIC (1971)	450 PASS.	100 TRUCKS	550 TOTAL 75
TRAFFIC FORECAST (1991)	770 PASS.	180 TRUCKS	950 TOTAL 130
DESIGN SPEED	60		MPH
TRAFFIC CLASSIFICATION	M		
MINIMUM SIGHT DISTANCE (STOPPING)	475		
MINIMUM SIGHT DISTANCE (SAFE PASSING)	2300		
MINIMUM PASSING SIGHT DISTANCE FOR MARKING 1000			



SKETCH MAP OF OLIVER AND MORTON COUNTIES



P.S. & E. Changes made
November 17, 1971

APPROVED DATE 3/1/76

CHIEF ENGINEER
NORTH DAKOTA STATE
HIGHWAY DEPARTMENT

APPROVED

DIVISION ENGINEER

DATE _____

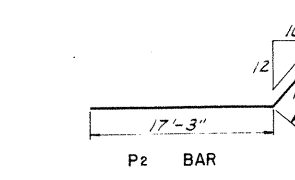
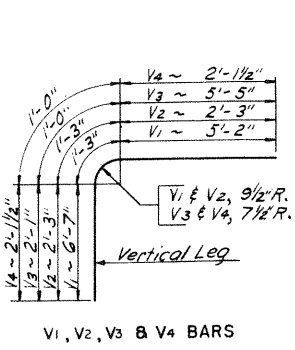
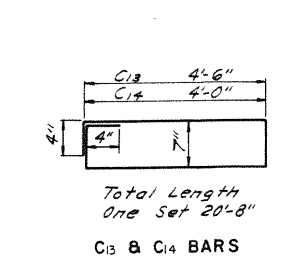
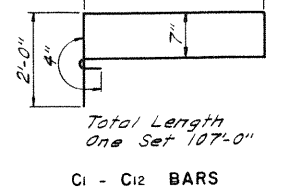
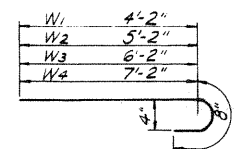
ROS-1-031(02)086

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
5	N. D.	R05-1-03107-100	1962	26	

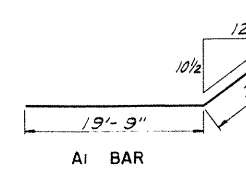
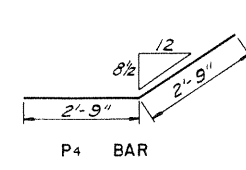
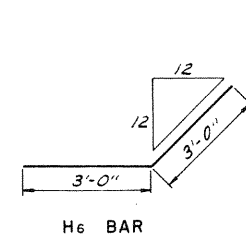
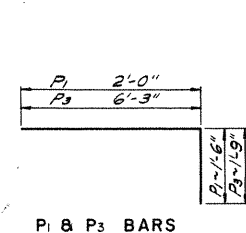
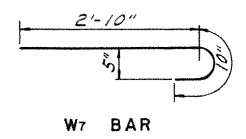
CONCRETE FORMULAS		DAMPPROOFING FORMULA
Entire Floor	$"L" \times 1.132 + 24.41 \text{ Cu. Yd.}$	$"L" \times .2963 + 4.5 \text{ Sq. Yd.}$
Inner Walls	$"L" \times .321 + 1.72 \text{ Cu. Yd.}$	
2 Side Walls & 4 Wings	$"L" \times .321 + 3.36 \text{ Cu. Yd.}$	
Entire Roof	$"L" \times .922 + 2.29 \text{ Cu. Yd.}$	
Total	$"L" \times 2.696 + 37.78 \text{ Cu. Yd.}$	

BAR LIST (CONSTANT)					
MARK	NO.	SIZE	LENGTH	SHAPE	
A1	8	6	22'-9"	Bent	
A2	16	4	17'-0"	Str.	
A3	4	6	10'-0"	"	
A4	4	4	21'-0"	"	
C1-C12	4 Sets	4	107'-0"	Bent	
C13-C14	8 Sets	"	20'-8"	"	
F5	16	5	34'-0"	Str.	
F6	16	6	12'-0"	"	
F7	16	"	5'-9"	"	
H1	16	6	15'-9"	Str.	
H2	8	4	3'-9"	"	
H3	8	"	8'-0"	"	
H4	8	"	12'-0"	"	
H5	16	"	15'-0"	"	
H6	108	"	6'-0"	Bent	
H7	8	6	6'-0"	Str.	
O1	8	4	3'-6"	Str.	
O2	8	"	4'-6"	"	
O3	8	"	5'-6"	"	
O4	8	"	6'-6"	"	
O5	8	"	7'-6"	"	
O6	4	"	8'-6"	"	
P1	66	4	3'-6"	Bent	
P2	8	6	13'-9"	"	
P3	42	4	8'-0"	"	
P4	8	6	5'-6"	"	
P5	8	"	8'-6"	Str.	
T2	50	4	6'-3"	Str.	
T3	8	"	5'-3"	"	
T4	8	"	4'-6"	"	
T5	8	"	3'-6"	"	
V6	8	4	5'-9"	Str.	
V7	8	"	4'-3"	"	
V8	8	"	2'-9"	"	
W1-W4	12 Sets	4	25'-4"	Bent	
W5	12	"	7'-9"	Str.	
W6	4	"	8'-6"	"	
W7	16	5	3'-8"	Bent	
Total Wt.			4,782		

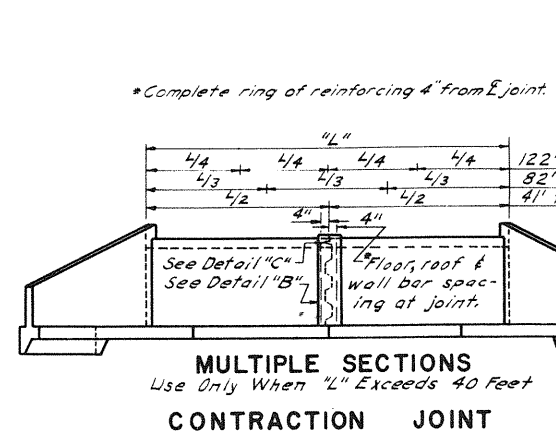
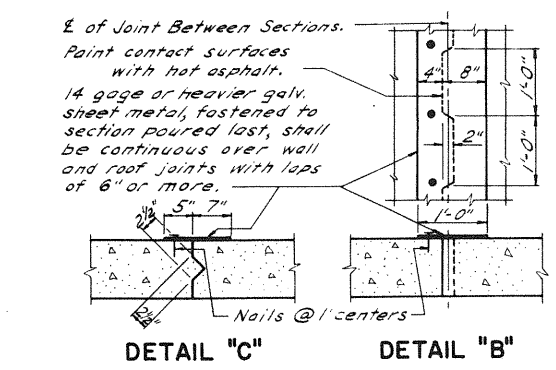
12'-11"	C12	5'-0"
10'-9"	C11	3'-11"
9'-11"	C10	3'-6"
9'-7"	C9	3'-4"
9'-3"	C8	3'-2"
8'-11"	C7	3'-0"
8'-6"	C6	2'-9 1/2"
8'-2"	C5	2'-7 1/2"
7'-9"	C4	2'-5"
7'-5"	C3	2'-3"
7'-1"	C2	2'-1"
6'-9"	C1	1'-11"



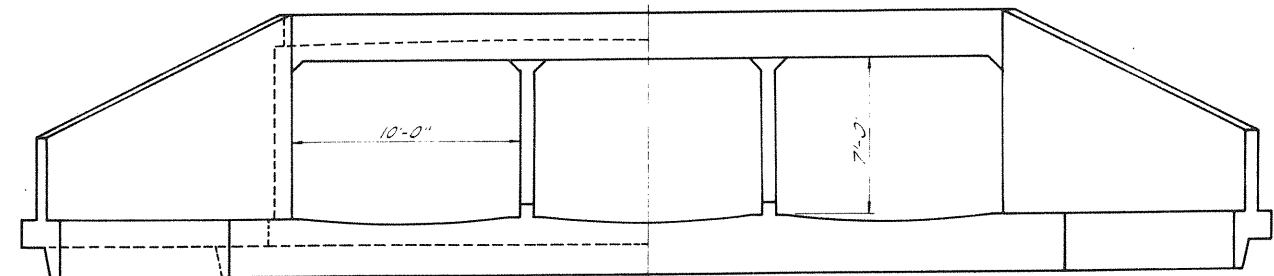
BENT BAR DETAILS



CONTRACTION JOINT

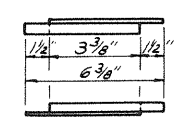
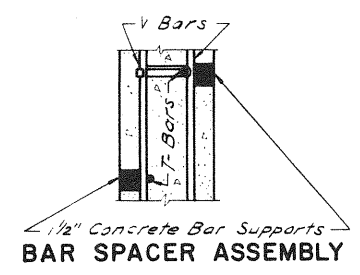


CONTRACTION JOINT



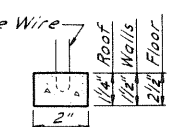
END VIEW

DAMPPROOFING
Two coats of dampproofing shall be applied over the entire length of the construction joints at the top and bottom of walls (outside surfaces only) as shown on the details.
"Dampproofing Two Coats" will be applied measured and paid for in accordance with Section 736 of the Standard Specifications.

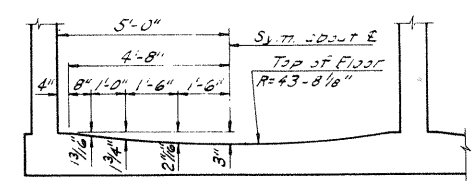


3/4" x 3/4" L-14 Ga. or heavier sheet metal. Bend ends around T & V bars so bar will bear against leg of angle. Space about 4'-0" c.c.

BAR SPACER BAR SUPPORT DETAILS



Concrete in bar supports to be 1:2 mortar. Blocks may be either round or square in section.



CURVED FLOOR OFF-SETS

CONSTRUCTION NOTES
REINFORCEMENT:
The transverse and vertical bars shall always be placed nearest the surface. The longitudinal, temperature or tie bars shall be placed immediately inside of the vertical and transverse bars and the intersections wired.
When the distance between end bars is not evenly divisible by the bar spacing, the odd distance should be adjusted by a few irregular spaces near the center, not at the ends of the culvert or section of culvert.
The clear distance from the nearest bar to the surface of the concrete shall be as follows:
Bottom of floor slab 2 1/2" Clear.
Bottom of wing footing 2 1/2" Clear.
Top of floor slab 2" Clear.
Top of wing footing 2 1/2" Clear.
All walls 1 1/2" Clear.
Bottom of roof slab 1 1/4" Clear.
Top of roof slab 1 1/4" Clear.
CONCRETE:
All concrete shall be class AE-3 and shall be compacted by vibration.
The following elements of each section shall be poured in one continuous run:
1. Floor slab and wing footings.
2. Each intermediate wall up to bottom of fillets.
3. Each side wall up to bottom of fillet with its adjacent wings complete to top.
4. Roof slab and parapets.
All exposed edges of concrete shall be beveled with 3/4" triangular mauling.
The concrete in the walls shall be allowed to set at least two (2) hours before the roof slab is poured.
Unsuitable foundation material shall be removed and replaced with suitable backfill. This backfill will be paid for at the contract price bid for "Foundation Fill".

DESIGN LOADING H20 S16 (1949)				SERIES OF 1951			
QUANTITIES FOR ONE CULVERT							
LENGTH FEET	CONC. AE-3 CU. YD.	REINF. STEEL LBS.	DAMPPROOFING TWO COATS SQ. YDS.	LENGTH FEET	CONC. AE-3 CU. YDS.	REINF. STEEL LBS.	DAMPPROOFING TWO COATS SQ. YDS.
46'	161.80	23,288		81	256.16	36,806	29.4
				84	264.24	37,568	

NORTH DAKOTA
STATE HIGHWAY DEPARTMENT

STANDARD
REINFORCED CONCRETE
TRIPLE BOX CULVERT

CLEAR SPAN 3X10' CLEAR HEIGHT 7'

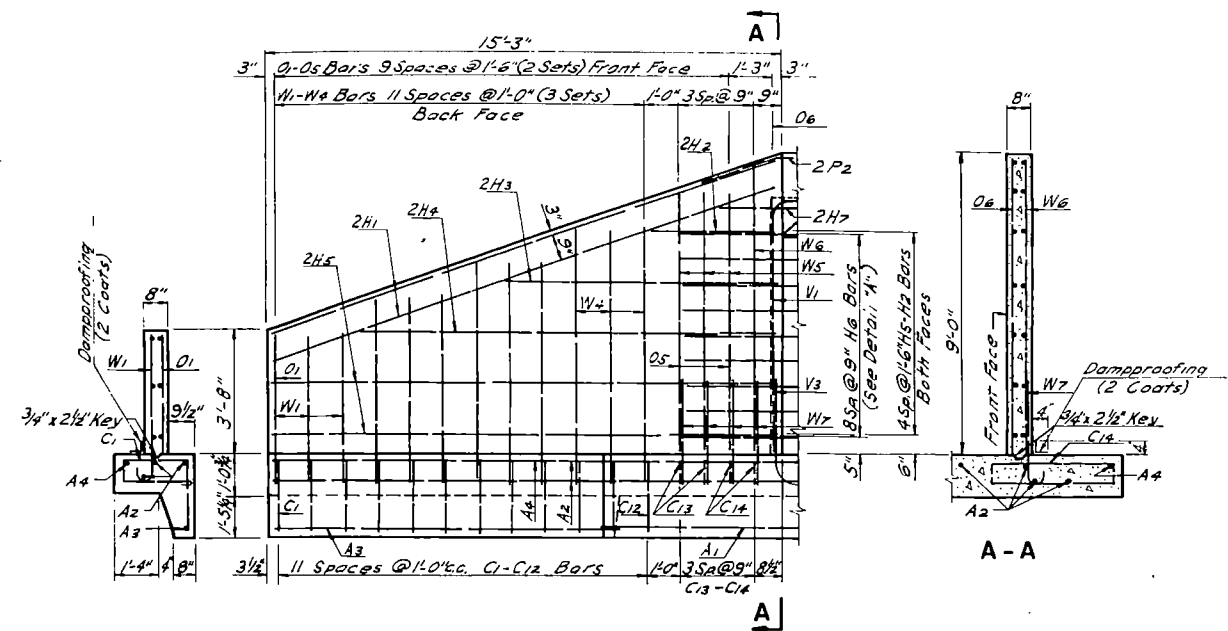
MAXIMUM FILL 5'

APPROVED Aug 6, 1962 *Joseph R. Kelly*
CIVIL ENGINEER

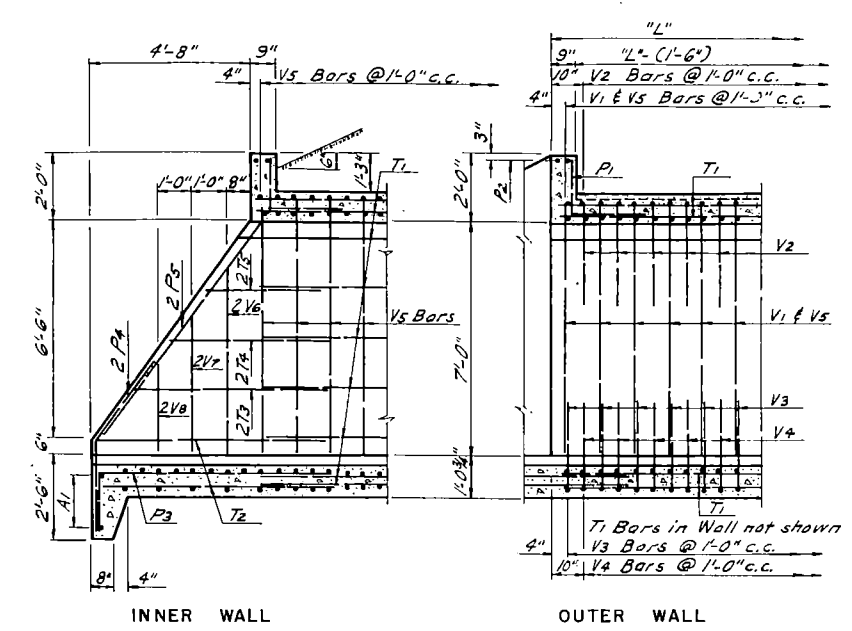
330107-1

BAR LIST (VARIABLE)					
MARK	SIZE	SHAPE	LENGTH	WT / BAR	
F1	6	Str.	32'-9"	49.19	
F2	4	"	11'-6"	7.68	
F3	5	"	22'-0"	22.95	
F4	6	"	6'-4"	9.57	
S1	6	Str.	32'-0"	48.07	
S2	4	"	32'-0"	21.86	
S3	5	"	22'-0"	22.95	
S4	6	"	6'-4"	9.57	
V1	5	Bent	13'-0"	13.56	
V2	5	"	5'-9"	6.00	
V3	4	"	8'-6"	5.67	
V4	4	"	5'-3"	3.50	
V5	4	Str.	7'-6"	5.01	
T1	4	Str.	WT / BAR NO. LENGTH	15.02	
				272	
				39'-9"	

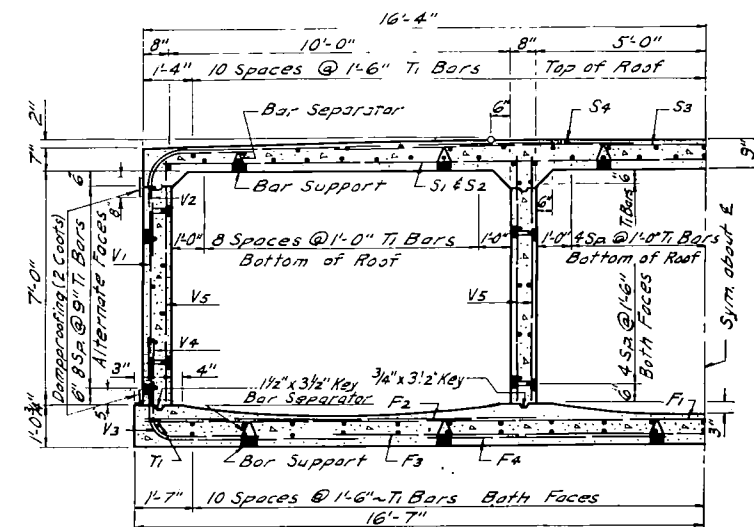
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
5	N.D.	RDS-1-03	(02)086	27	



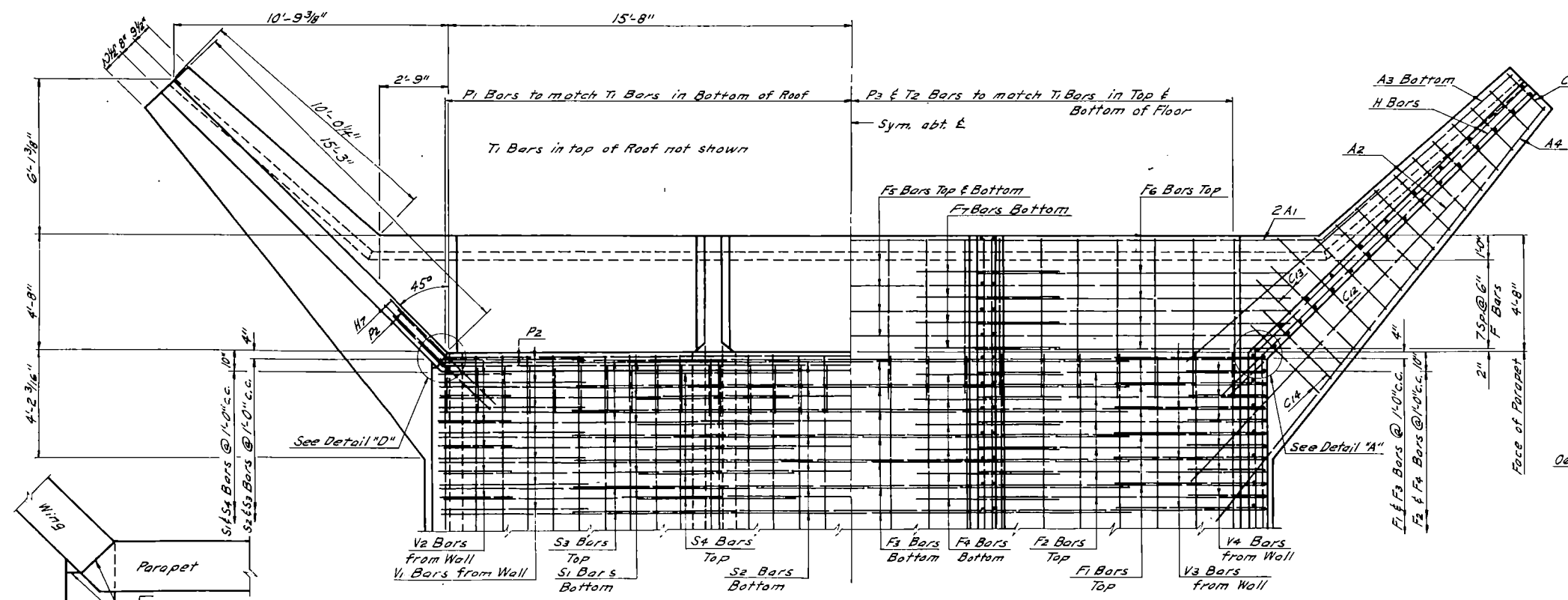
WING ELEVATION



INNER WALL
LONGITUDINAL SECTIONS
OUTER WALL

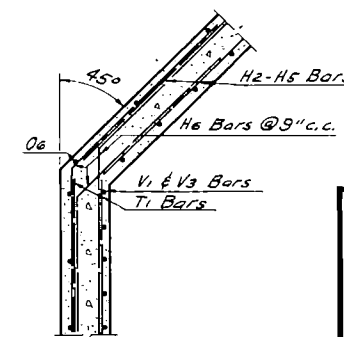


SECTION OF BARREL

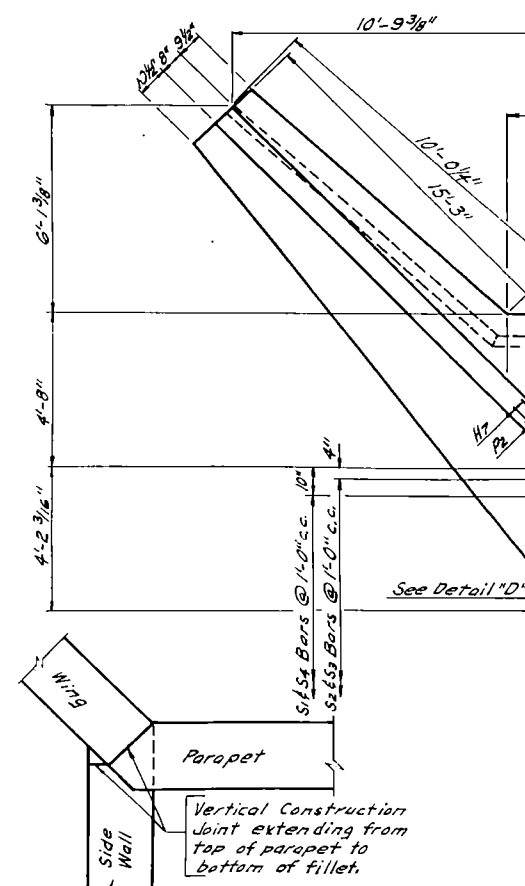


PART PLAN OF ROOF

PART PLAN OF FLOOR



DETAIL "A"



DETAIL "D"

NORTH DAKOTA
STATE HIGHWAY DEPARTMENT
STANDARD
REINFORCED CONCRETE
TRIPLE BOX CULVERT

CLEAR SPAN 3X10' CLEAR HEIGHT 7'
MAXIMUM FILL 5'

APPROVED Aug. 6, 1962 [Signature]
BRIDGE ENGINEER

SHEET 2 OF 2

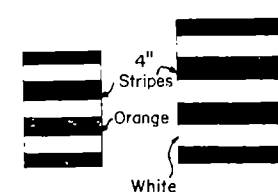
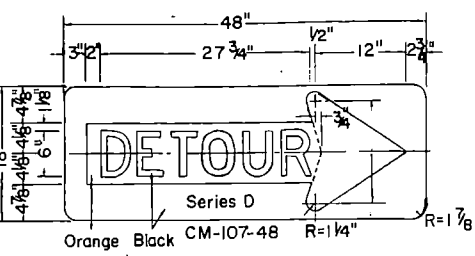
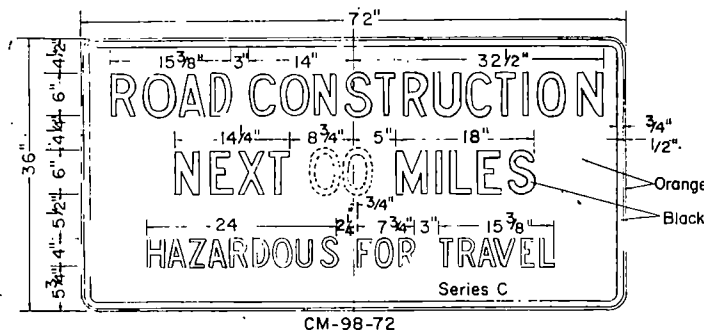
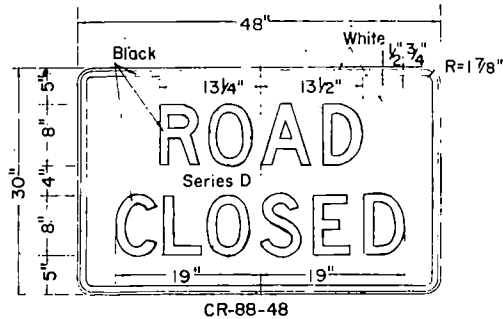
31-7 31-81.25 330107-2

330107-2

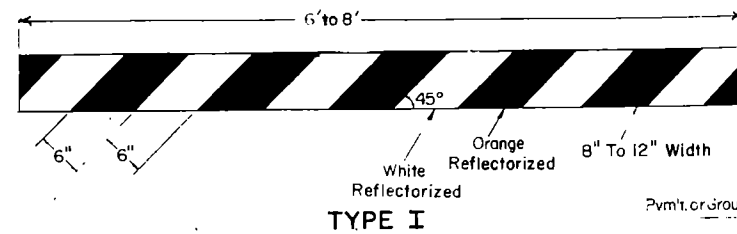
CONSTRUCTION SIGNS AND BARRICADE DETAILS

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
8	N.D.	205-1-031(02)	28		

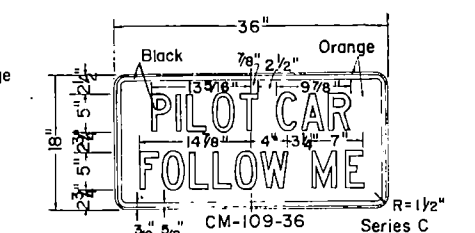
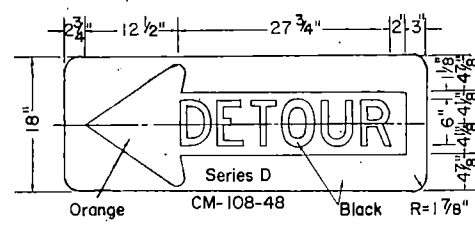
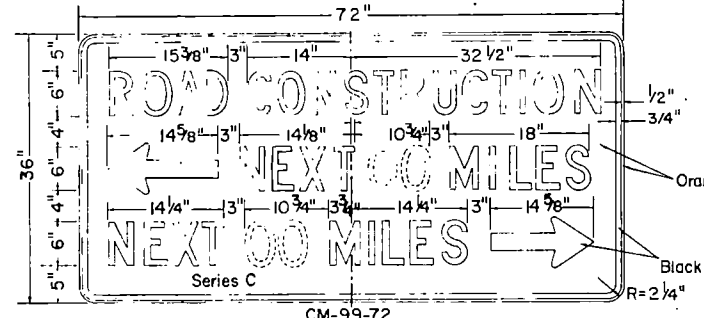
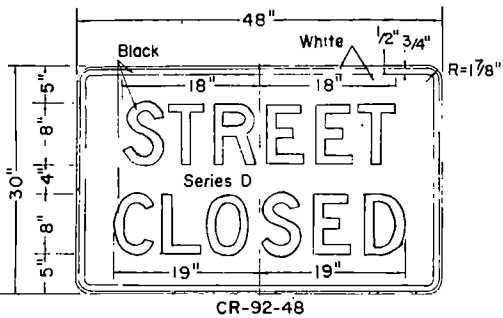
D-754-71-1



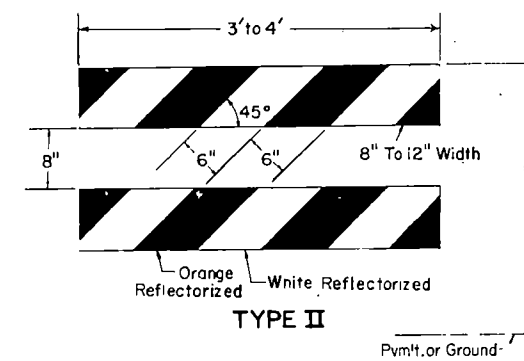
Adjustment due to odd size drums should be divided between the upper and lower stripes.
Reflectorized delineator drum shall be an oil drum striped as shown. The entire drum shall be given 2 coats of orange paint in accordance with Section 870 of the Std. Specs. Reflective sheeting shall be applied after painting.



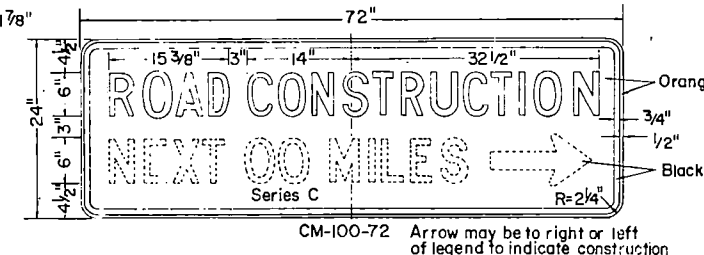
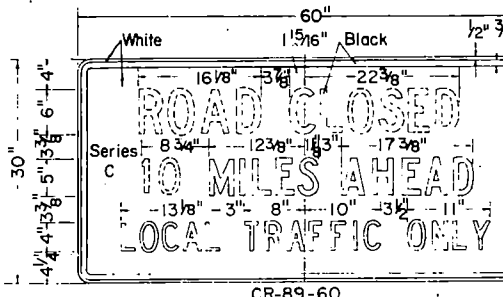
Approx. Wt./Ft. In Lbs. = 1.277
Extruded Aluminum Barricade Bar Detail



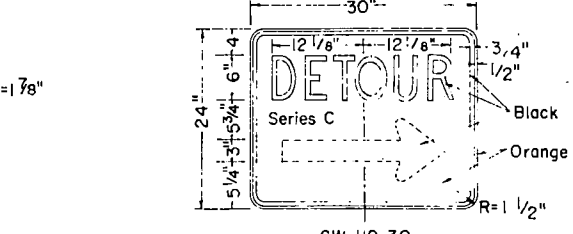
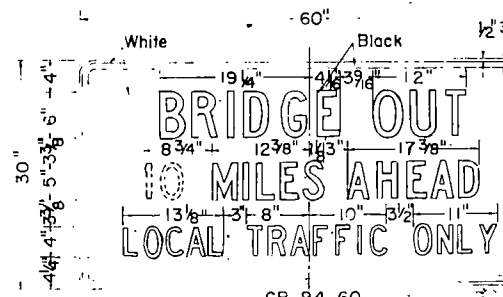
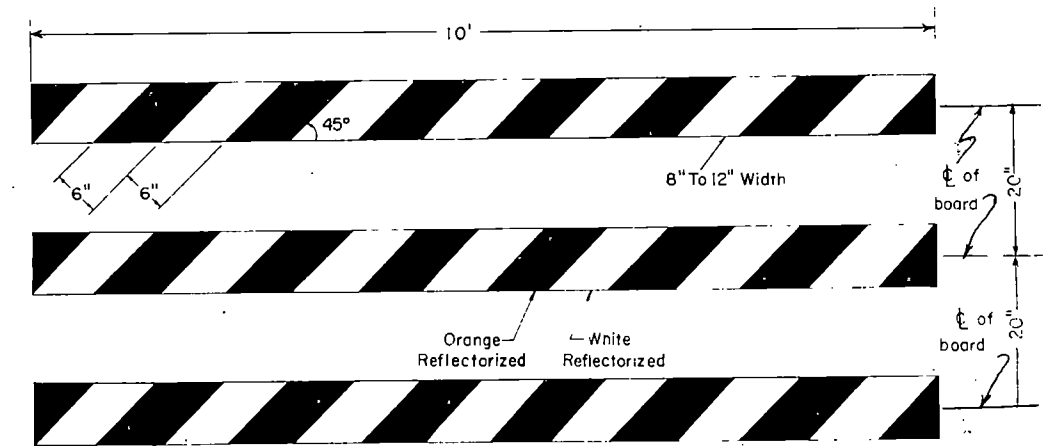
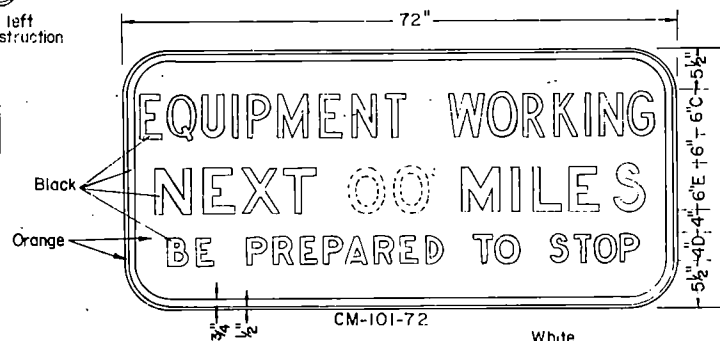
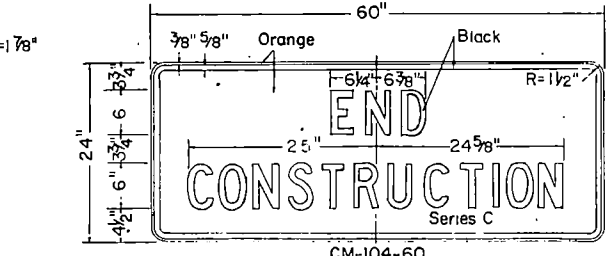
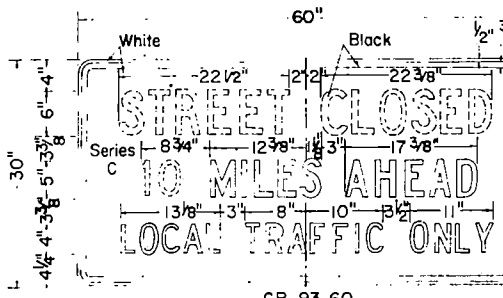
Pilot Car sign shall be mounted on rear of a vehicle used for guiding controlled one-way traffic through a construction area.



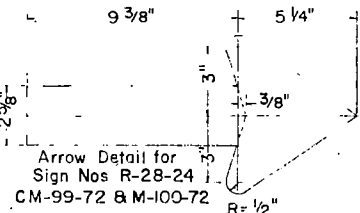
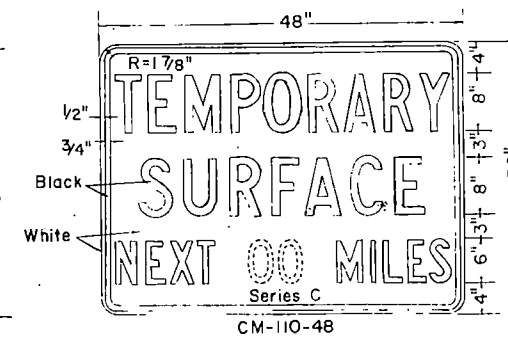
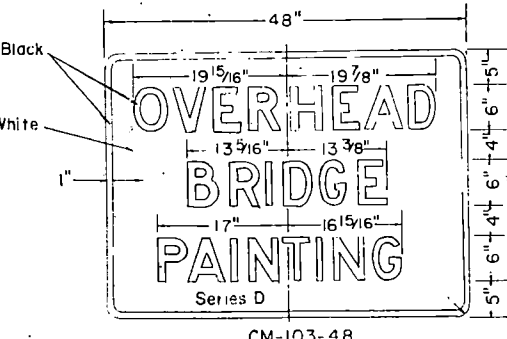
Each movable barricade shall be weighted down by a sufficient number of sand bags or other suitable weight so that it will not be blown over by the wind unless the movable supporting structure is constructed in such a manner that the wind cannot blow it over. Weight used shall be approved by the Engineer in the field. Generally the stripes shall slant downward toward the side which traffic is to pass. Barricades used at the beginning of a project shall face traffic entering that project.



Arrow may be to right or left of legend to indicate construction to the right or left



Arrow may be right or left to indicate direction of Detour



Arrow Detail for Sign No. CW-119-30

DATE	REVISIONS
6-5-72	Barricade Details
9-19-73	Sign Size

NORTH DAKOTA
STATE HIGHWAY DEPARTMENT
Submitted: _____ Design Engineer
Recommended: _____ Asst. Chief Engineer, Pre-Const.
Approved: _____ Chief Engineer