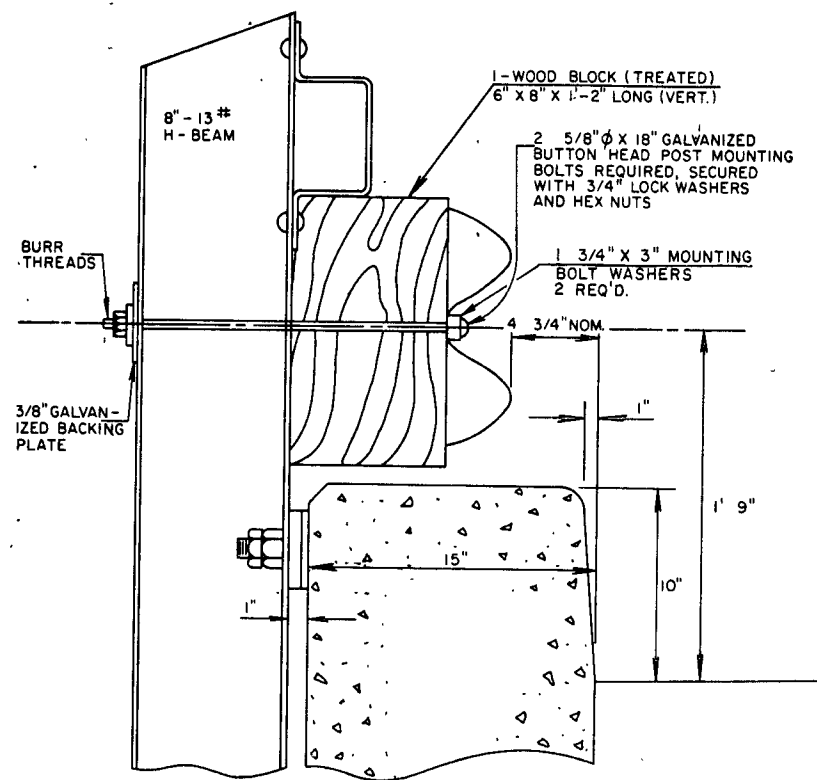
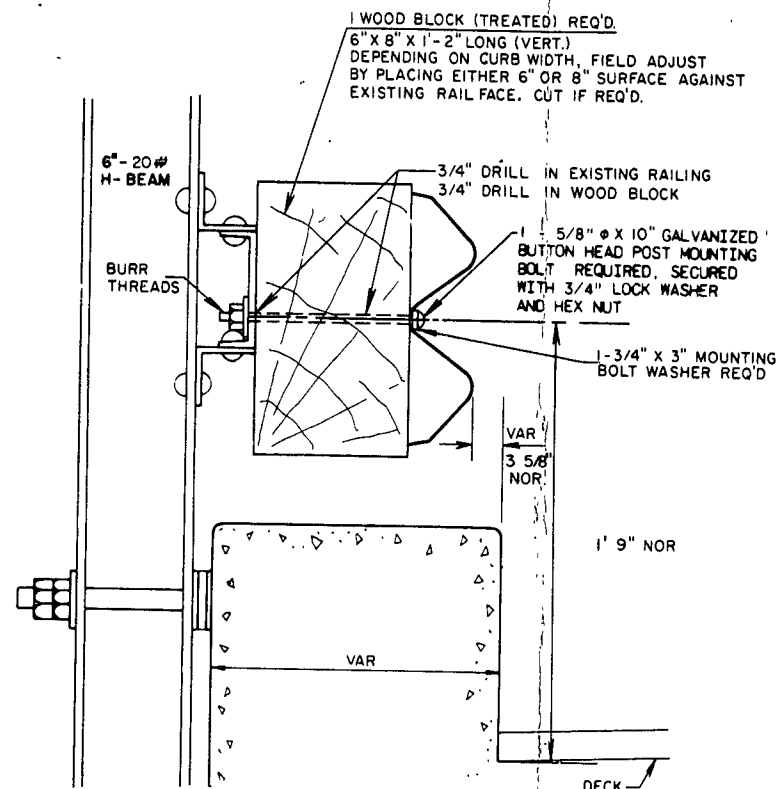




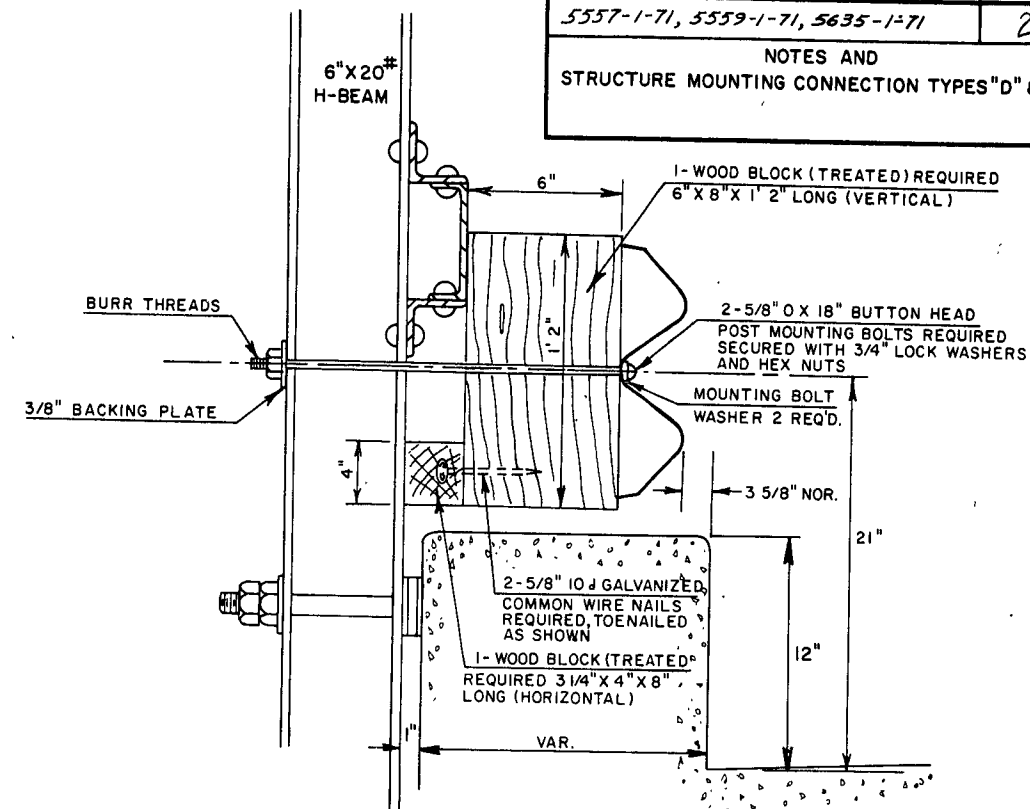
SIDE VIEW

STRUCTURE MOUNTING CONNECTION TYPE "E"



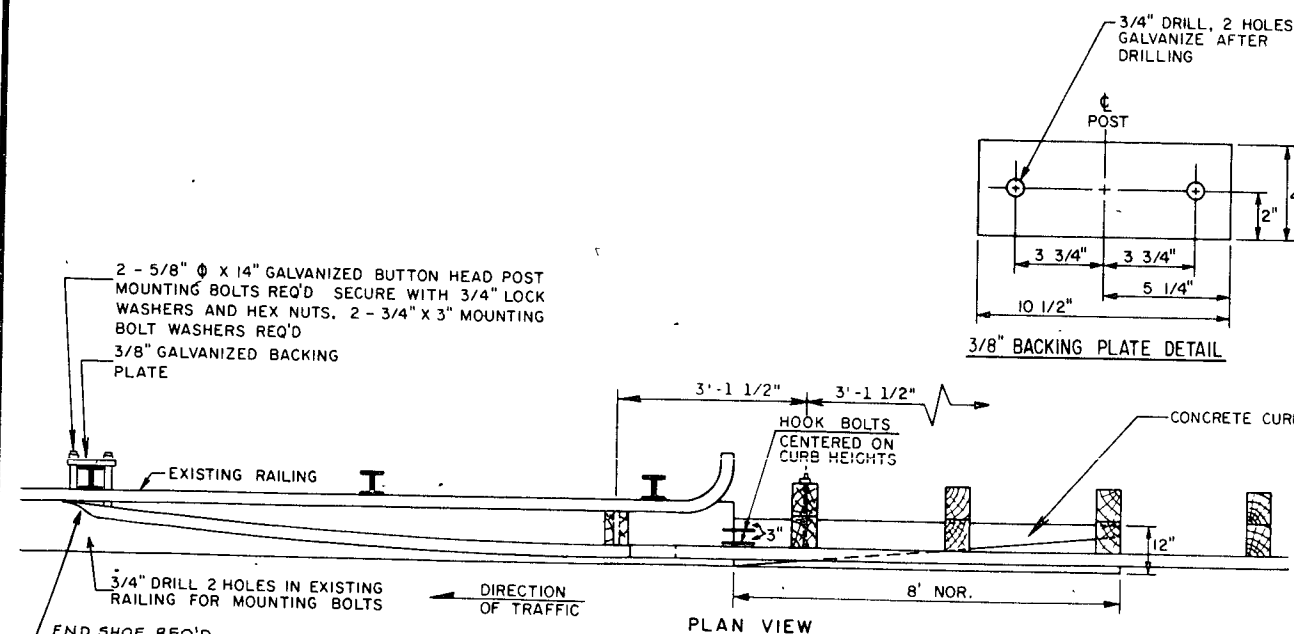
SIDE VIEW

STRUCTURE MOUNTING CONNECTION, TYPE "D"

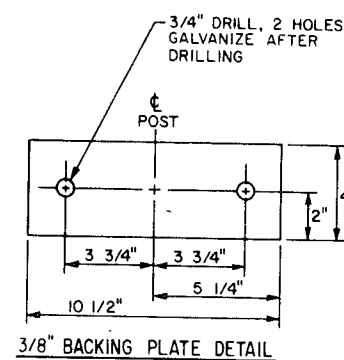


SIDE VIEW

STATE PROJECT NUMBER	SHEET NO.
5557-1-71, 5559-1-71, 5635-1-71	2
NOTES AND STRUCTURE MOUNTING CONNECTION TYPES "D" & "E"	



PLAN VIEW

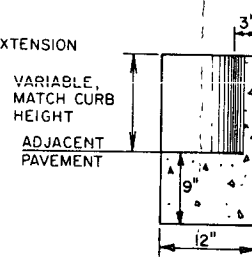


3/8" BACKING PLATE DETAIL

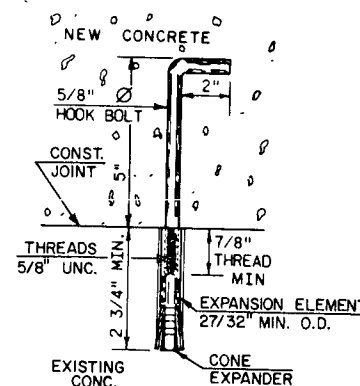
THE HOOK BOLTS SHALL CONFORM TO ASTM SPECIFICATION A307, EXCEPT THAT THE REQUIREMENT OF PARAGRAPH 1(C) SHALL NOT APPLY.

THE HOOK BOLTS SHALL BE SET IN EXISTING CONCRETE ACCORDING TO MANUFACTURER'S INSTRUCTIONS. THE HOLES SHALL BE OF THE RECOMMENDED DIAMETER AND DEPTH AND SHALL BE DRILLED BY METHODS RECOMMENDED BY THE MANUFACTURER OF THE PARTICULAR BOLT. THE DRILLED HOLES SHALL BE LEFT ROUGH, NOT REAMED, AND FREE FROM ANY DRILL DUST.

ANY CONCRETE OVERBREAK RESULTING FROM DRILLING THE HOLES FOR THE HOOK BOLTS SHALL BE REPAIRED WITH AN APPROVED NON-SHRINK GROUT.



CONCRETE CURB EXTENSION
END VIEW



HOOK BOLT DETAIL
(INCIDENTAL TO THE ITEM OF
CONCRETE CURB EXTENSION)

GENERAL NOTES FOR STRUCTURE MOUNTING CONNECTIONS.

REPAIR DAMAGED GALVANIZING WITH ZINC DUST-ZINC OXIDE PAINT ACCORDING TO TT-P-641.

THE STEEL PLATES & SHAPES AS SHOWN FOR ATTACHING BEAM GUARD TO STRUCTURES SHALL BE FABRICATED FROM ASTM A36 STEEL AND GALVANIZED AFTER FABRICATION ACCORDING TO ASTM A123.

THE STEEL BOLTS, STUDS, WASHERS AND NUTS TO BE UTILIZED FOR STRUCTURE MOUNTING CONNECTIONS SHALL BE GALVANIZED ACCORDING TO ASTM A164 OR A153 CL. C, TYPE G.S. THREADS SHALL BE MANUFACTURED WITH SUFFICIENT ALLOWANCE SO THE NUTS WILL RUN FREELY ON THE BOLTS.

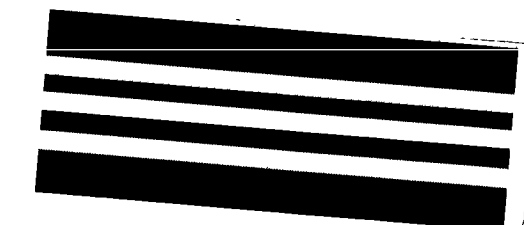
BURR THREADS AFTER MOUNTING.

EXPANSION BOLTS SHALL BE RAWL-STUD 7234, 5/8" DIA. X 6"; WEJ-IT 101548, 5/8" DIA. X 6" KWIK-BOLT 58-6, 5/8" DIA. X 6" OR APPROVED EQUAL.

ALL LABOR, MATERIALS AND EQUIPMENT NEEDED SHALL BE CONSIDERED AS INCIDENTAL TO THE WORK; AND THE COST, THEREOF, SHALL BE INCLUDED IN THE BID PRICE OF LINEAR FOOT OF STEEL PLATE BEAM GUARD, CLASS A.

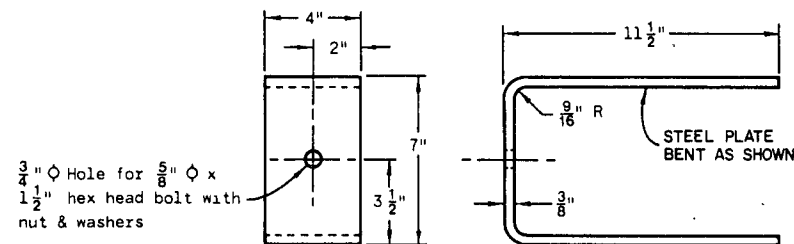
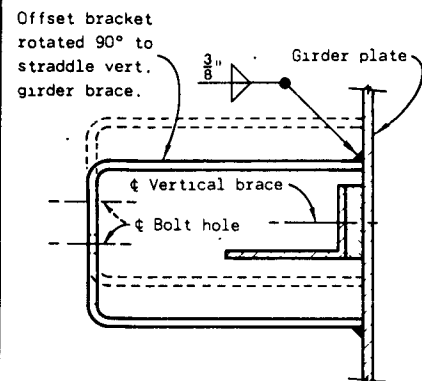
STEEL PLATE BEAM GUARD OF STANDARD LENGTH. FABRICATE TO 95-FOOT RADIUS FOR B-22-827, 828,565,564

STRUCTURE MOUNTING CONNECTION DETAILS NOT TO SCALE.



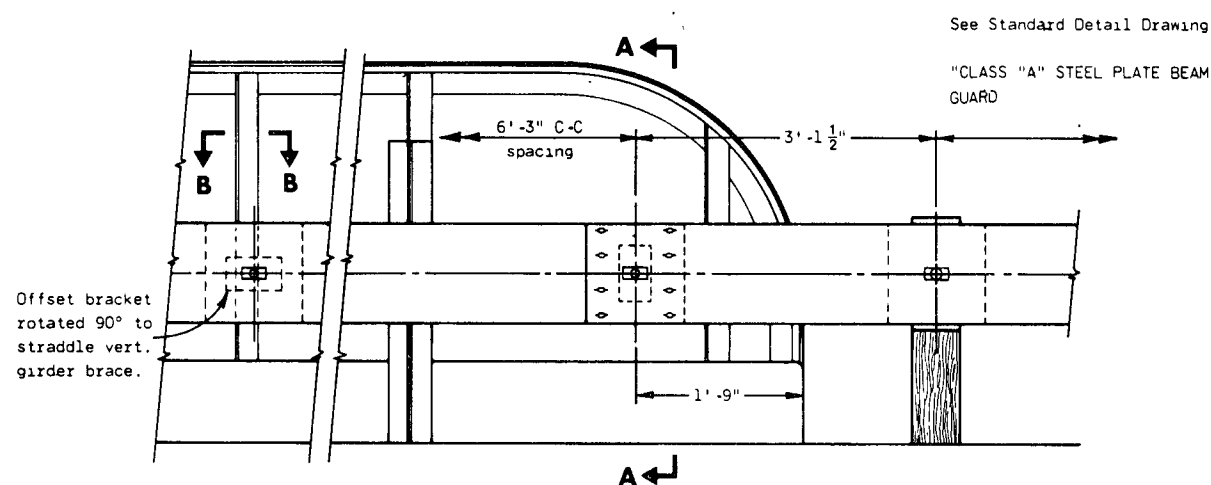
STANDARD DETAIL DRAWINGS

14B2-5A, B & C CLASS "A" STEEL PLATE BEAM GUARD (THREE SHEETS)
15C1-7 CONSTRUCTION BARRICADES AND STANDARD SIGNS



OFFSET BRACKET

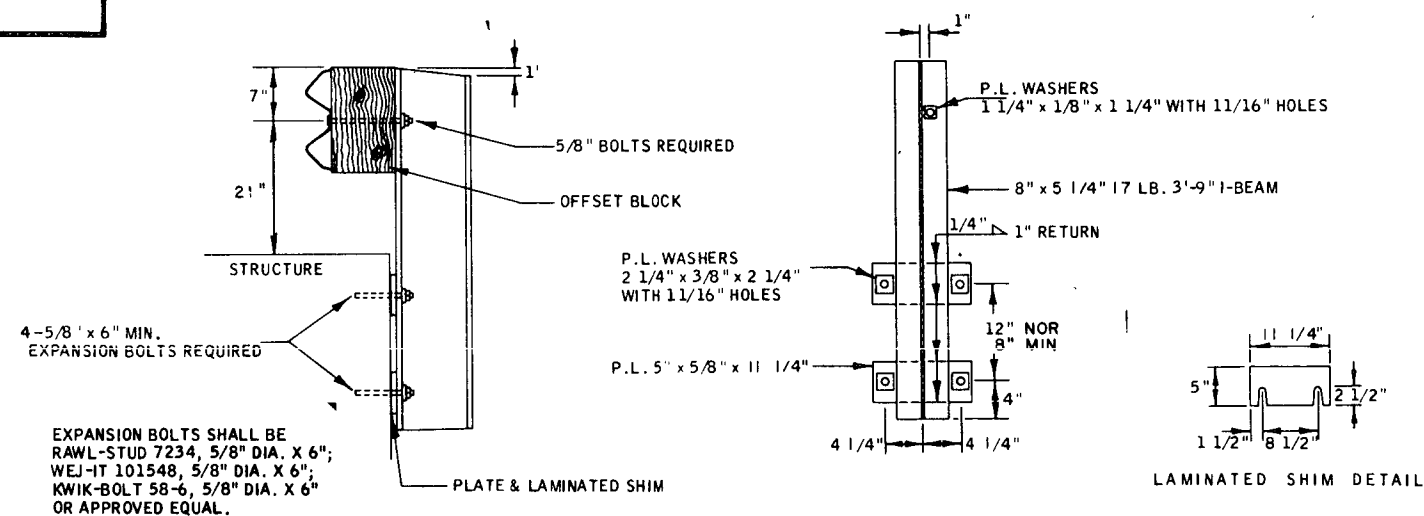
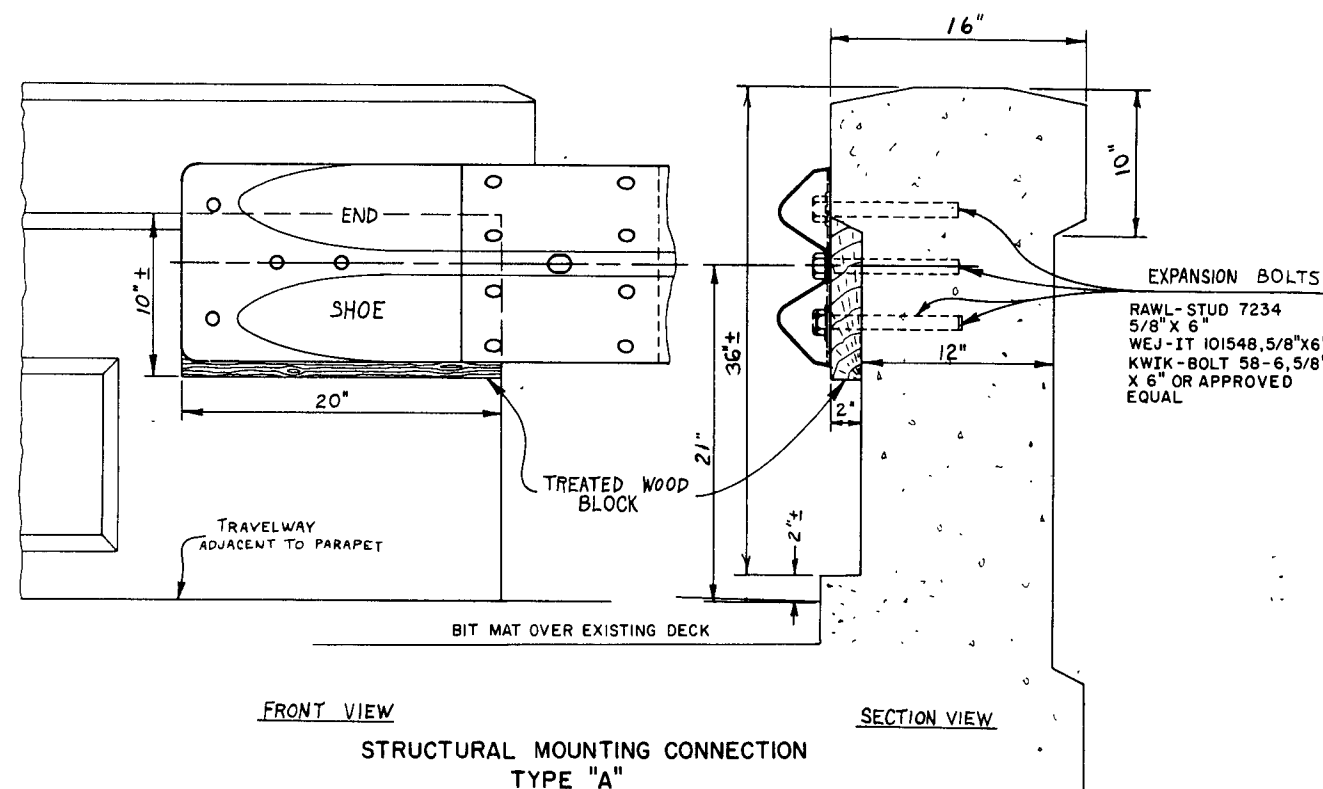
SECTION B-B



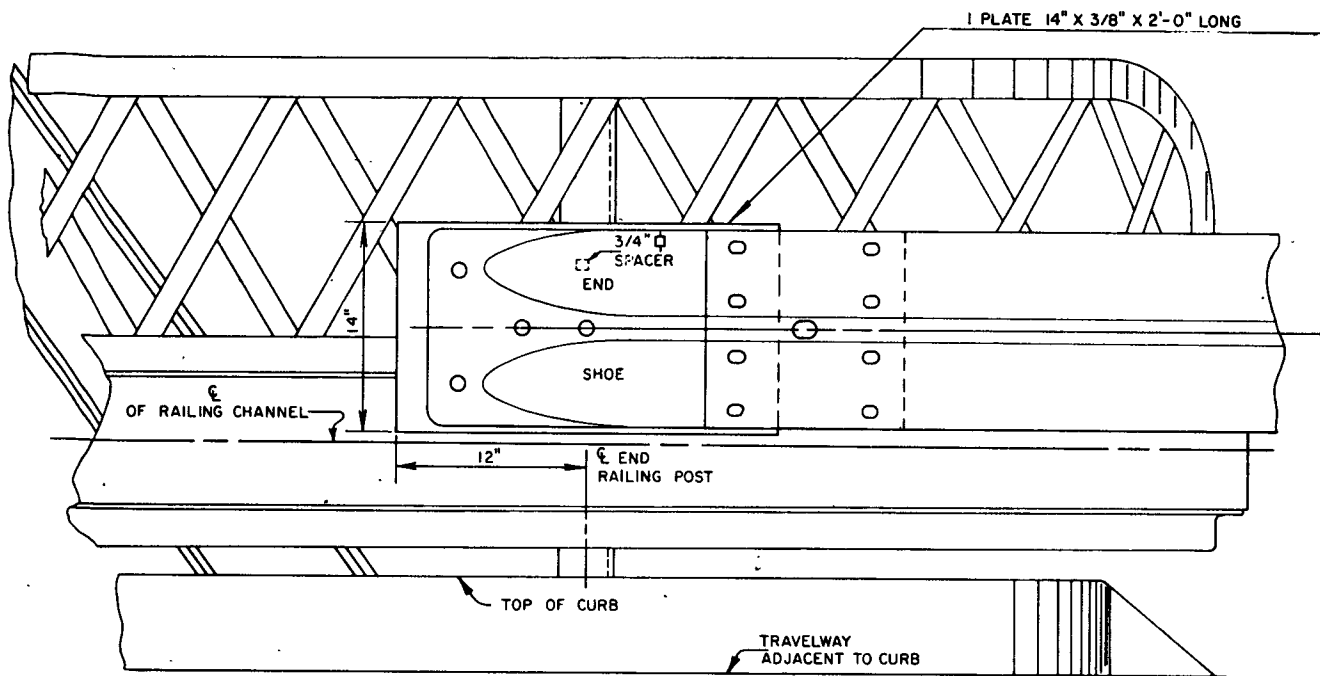
FRONT ELEVATION

RUN BEAM GUARD CONTINUOUS ACROSS STRUCTURE

STRUCTURE MOUNTING CONNECTION, TYPE "B"

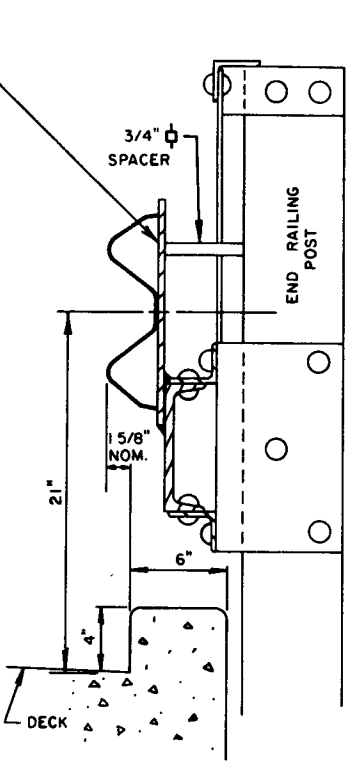


STRUCTURE MOUNTING DETAIL, TYPE "G"

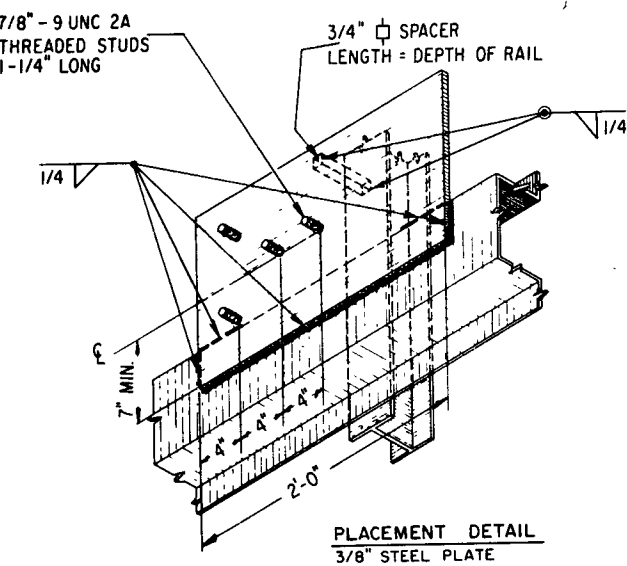


STRUCTURE MOUNTING DETAIL, TYPE "C"

FRONT VIEW



SIDE VIEW



STEEL OFFSET BRACKETS AND WELDED JOINTS SHALL BE PAINTED WITH A RUST PREVENTIVE PAINT PRIOR TO ATTACHING GUARDRAIL.

MISCELLANEOUS QUANTITIES

Project	Highway	Structure Number	Removing Guardrail L.F.	Removing Railing L.F.	Steel Plate Beam Guard, Class A L.F.	Anchorage for Steel Plate Beam Guard Each	Special Anchorage for Steel Plate Beam Guard Each	Structure Mounting Connection** Each	Type	Concrete Curb Extensions C. Y.	Crushed Aggregate Base Course C. Y.
5557-1-71	U. S. H. 18	B-22-829	237		388	2	2	4	C		
	✓ S. T. H. 35	Box Culvert	112		277	3	1	4	A		
	✓ S. T. H. 35	B-22-828	162		368	4		4	D	1.5	
	✓ S. T. H. 81	B-22-833	112		616	4		4	A		
	✓ S. T. H. 81	B-22-834	112		616	4		4	A		
	✓ S. T. H. 81	B-22-835	187		316	4		4	C		Undistributed 100
	✓ S. T. H. 81	B-22-827	162		664	4		4	E	1.5	
	U. S. H. 151	B-22-47	162		258	2		2	F	1.0	
	U. S. H. 151	B-22-565	137		316	3	1	4	D	1.5	
	U. S. H. 151	B-22-564	1204*		1292	4		4	D	1.5	
	✓ U. S. H. 61	B-22-702	162		392	4		Continuous	D	1.5	
	✓ S. T. H. 133	B-22-839	312		616	4		4	C		
5559-1-71	S. T. H. 80	Box Culvert	56		632	4		Continuous	G		
											Undistributed 50
	S. T. H. 130	B-25-933		260	856	4		Continuous	G		
	S. T. H. 39	B-25-929		190	780	4		Continuous	G		
	S. T. H. 39	B-25-930			726	4		Continuous	B		
	S. T. H. 78	B-25-931			616	4		4	A		
5635-1-71	S. T. H. 78	B-33-829			467	2	2	4	A		
	S. T. H. 78	B-33-831			616	4		4	A		
	S. T. H. 78	B-33-832			726	4		Continuous	B		
	S. T. H. 81	B-33-841			616	4	1	4	A		
	S. T. H. 81	B-33-840			616	4		4	A		Undistributed 50

*Includes 1164 L.F. Cable Guard Fence.

**INCIDENTAL TO STEEL PLATE BEAM GUARD



ESTIMATE OF QUANTITIES

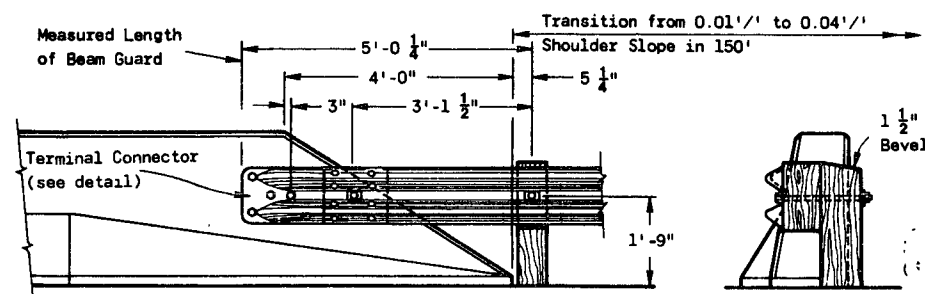
DATE 04/14/82

PROJECT ID: 5557-01-71
GRANT COUNTY
VARIOUS BRIDGE APPROACHES
(UPGRADE BEAM GUARD)
VARIOUS STATE TRUNK HIGHWAYS

PROJECT ID: 5559-01-71
IOWA COUNTY
VARIOUS BRIDGE APPROACHES
(UPGRADE BEAM GUARD)
VARIOUS STATE TRUNK HIGHWAYS

PROJECT ID: 5635-01-71
LAFAYETTE COUNTY
VARIOUS BRIDGE APPROACHES
(UPGRADE BEAM GUARD)
VARIOUS STATE TRUNK HIGHWAYS

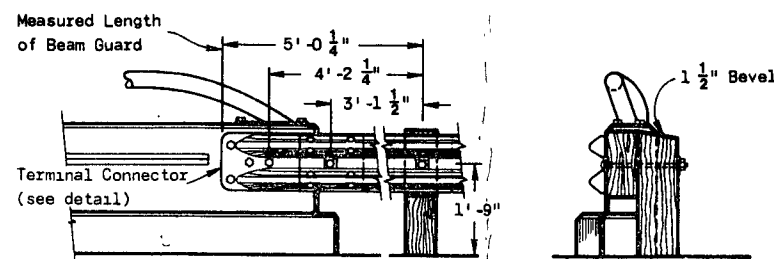
ITEM	ITEM DESCRIPTION	UNIT	TOTAL	5557-01-71 QUANTITY	5559-01-71 QUANTITY	5635-01-71 QUANTITY
20411	REMOVING GUARDRAIL	L.F.	2,931.00 3,117.00	2,849.00 3,064.00	82.00 56.00	
30403	CRUSHED AGGREGATE BASE COURSE	C.Y.	365.00 200.00	161.00 100.00	104.00 50.00	100.00 50.00
61406	ANCHORAGES FOR STEEL PLATE BEAM GUARD	EACH	77.00 80.00	40.00 42.00	20.00	17.00 18.00
61408	STEEL PLATE BEAM GUARD, CLASS A	L.F.	12,391.00 12,770.00	6,047.00 6,119.00	3,534.50 3,610.00	2,809.50 3,041.00
61911	MOBILIZATION, PROJECT 5557-01-71	L.S.	1.00	1.00		
61912	MOBILIZATION, PROJECT 5559-01-71	L.S.	1.00		1.00	
61913	MOBILIZATION, PROJECT 5635-01-71	L.S.	1.00			1.00
64302	TRAFFIC CONTROL, PROJECT 5557-01-71	L.S.	1.00	1.00		
64303	TRAFFIC CONTROL, PROJECT 5559-01-71	L.S.	1.00		1.00	
64304	TRAFFIC CONTROL, PROJECT 5635-01-71	L.S.	1.00			1.00
90001	CONCRETE CURB EXTENSIONS AT BRIDGES	C.Y.	10.1 0.50	8.7 0.50	1.4	C.C.O. 1
90003	REMOVING RAILING	L.F.	450.00		450.00	
90063	ANCHORAGES FOR STEEL PLATE BEAM GUARD, TYPE 1	EACH	9.00 8.00	6.00 4.00		3.00 2.00
50502	BAR STEEL REINF.,CULV.	Lb.	67.0		67.0	C.C.O. 1
90004	STRUCTURE MOUNTING POST	EA.	4.0		4.0	C.C.O. 1
90005	HOOK BOLTS	EA.	24.0		24.0	C.C.O. 1



FRONT VIEW

END VIEW

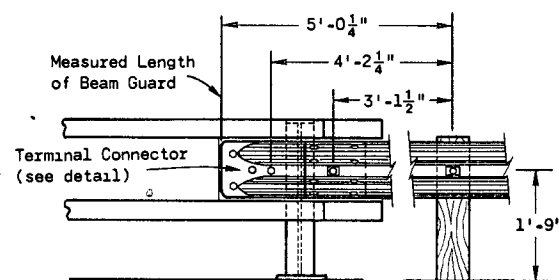
SLOPED FACE PARAPET



FRONT VIEW

END VIEW

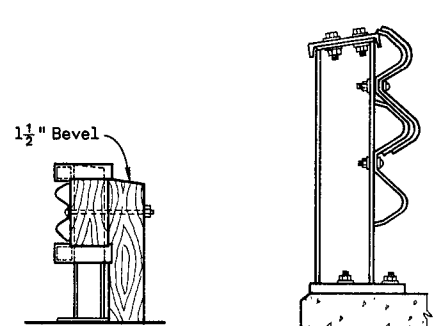
VERTICAL FACE PARAPET



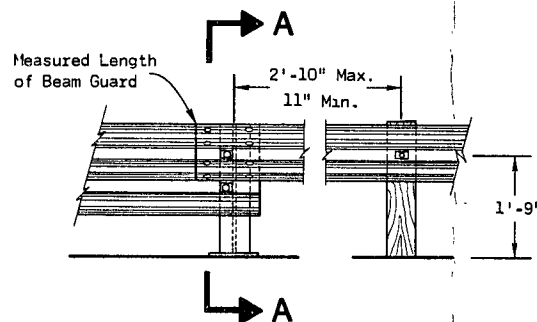
FRONT VIEW

END VIEW

RAILING TYPE "F"

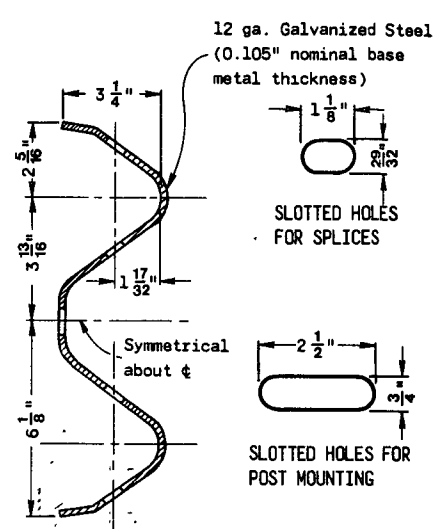


SECTION A-A



FRONT VIEW

RAILING TYPE "W"



SECTION THRU RAIL ELEMENT

GENERAL NOTES

Details of construction, materials and workmanship not shown on this drawing shall conform to the pertinent requirements of the Standard Specifications and the applicable Special Provisions.

The type of anchorage and the exact location of the beginning and end of each beam guard installation shall be as shown on the plans or as directed by the Engineer.

Shoulder widening to accommodate the anchored end of the beam guard shall be accomplished at a rate of widening not to exceed 5 to 1.

Standard Anchorages - Upon approval of the Engineer, the 6 foot offset may be reduced to nothing where existing conditions will not permit the desirable offset. However, when no offset greater than or equal to 3 feet can be provided, the minimum length of guardrail in advance of an obstacle (obstacle to anchor) shall be 150 feet.

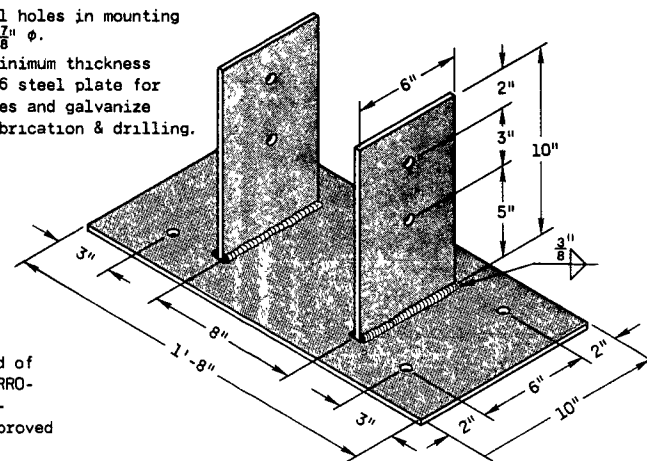
The "Post Footing Details at Piers" shall be used when beam guard posts are over structure footings and less than 3 feet - 6 inches of earth is provided over the top of the footing

① The minimum clearance from the front face of beam guard to obstacle shall be 4 feet unless otherwise shown on contract plans. When clearance is less than 4 feet, post spacing shall be reduced to 3 feet - 1 1/2" C-C.

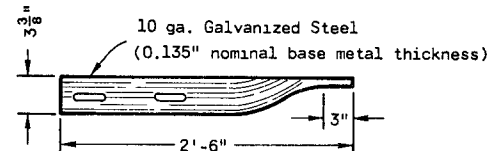
② This section shall include at least one 12'-6" Rail Element and a Terminal Connector when required for structure mounting.

NOTE:

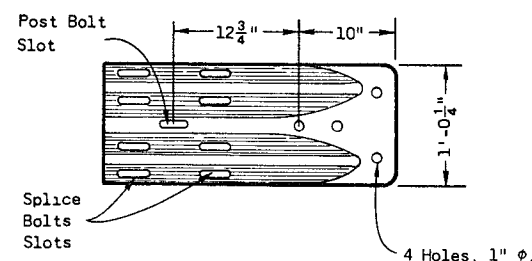
Drill all holes in mounting bracket $\frac{7}{8}$ " ϕ .
Use $\frac{3}{8}$ " minimum thickness ASTM A 36 steel plate for all pieces and galvanize after fabrication & drilling.



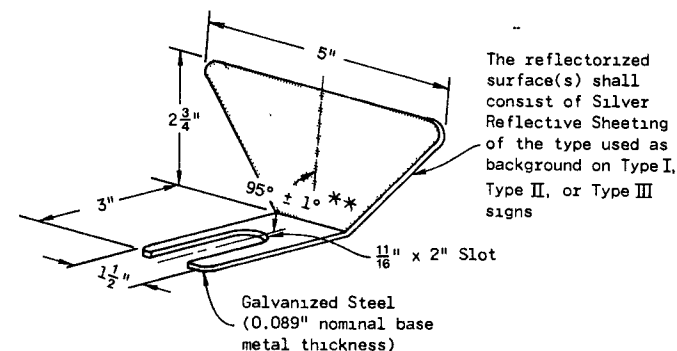
POST MOUNTING BRACKET



STRUCTURE MOUNTING DETAILS



TERMINAL CONNECTOR



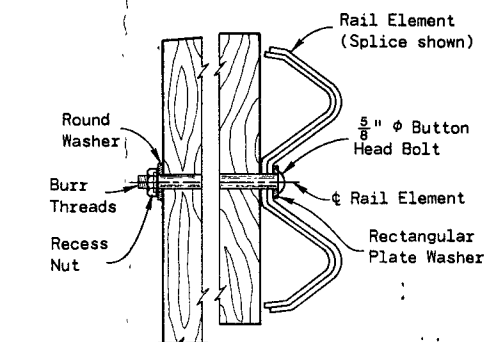
REFLECTOR SPACING

	Beam Guard Length	Reflector Spacing	No. Surfaces Reflectorized	Min. No. Reflectors
One Way Traffic	< 200'	50' C-C	1	3
	> 200'	100' C-C	1	
Two Way Traffic	< 200' *	25' C-C	1 *	6
	> 200' *	50' C-C	1 *	
Two Way Traffic	< 200'	50' C-C	2 **	3
	> 200'	100' C-C	2 **	

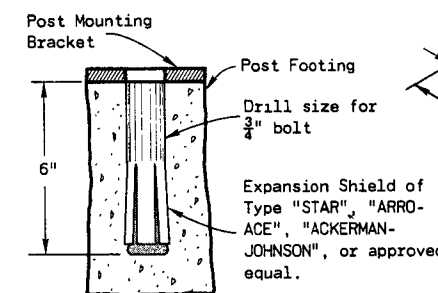
* Every other reflector reversed for 2-way visibility. Contractor may furnish two-sided reflectors in lieu of one-sided reflectors.

** Angle of bend to be 90° ± 1° for two-sided reflectors.

REFLECTOR DETAIL

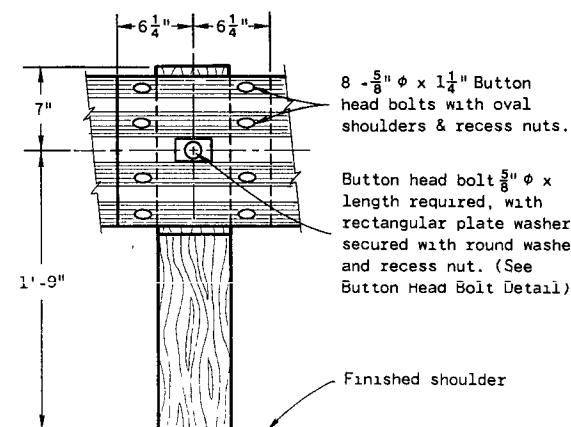


BUTTON HEAD BOLT DETAIL

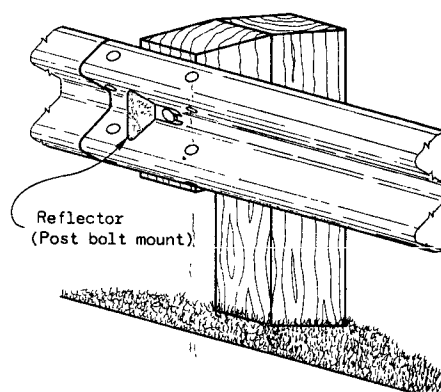


EXPANSION SHIELD DETAIL

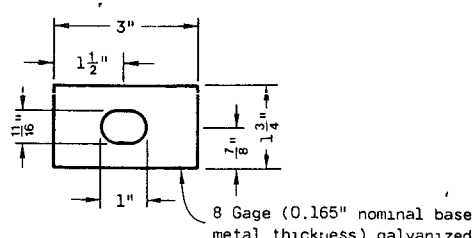
POST FOOTING DETAIL AT PIERS



RAIL ELEMENT SPLICING AND POST MOUNTING DETAIL



TYPICAL INSTALLATION



RECTANGULAR PLATE WASHER

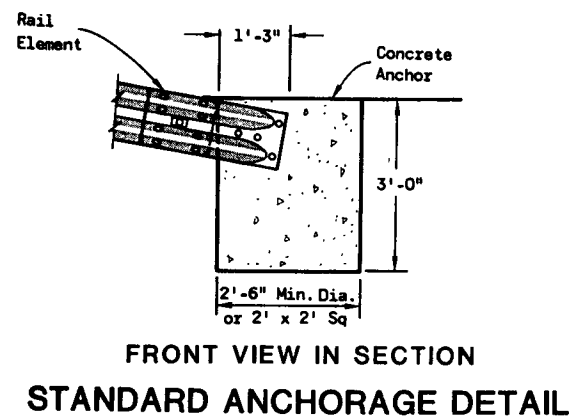
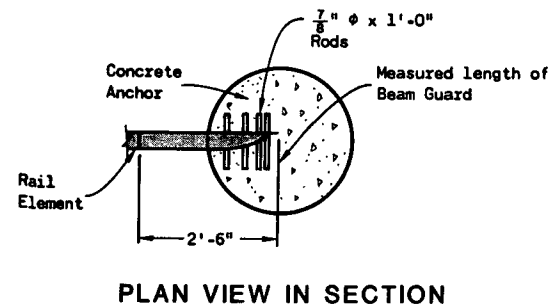
(Shall be omitted at selected locations when Type 1 Anchorages are used. See TANGENT OFFSETS, Sheet 5c)

CLASS "A"
STEEL PLATE BEAM GUARD

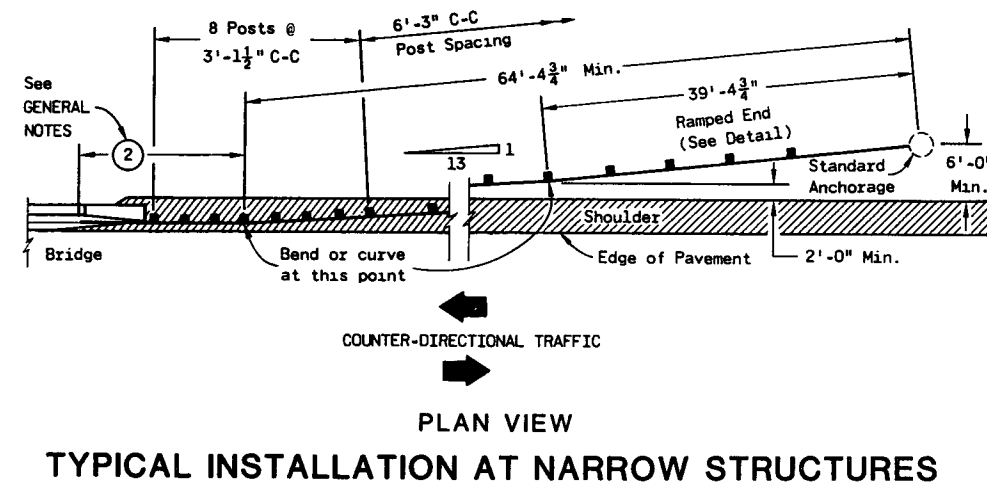
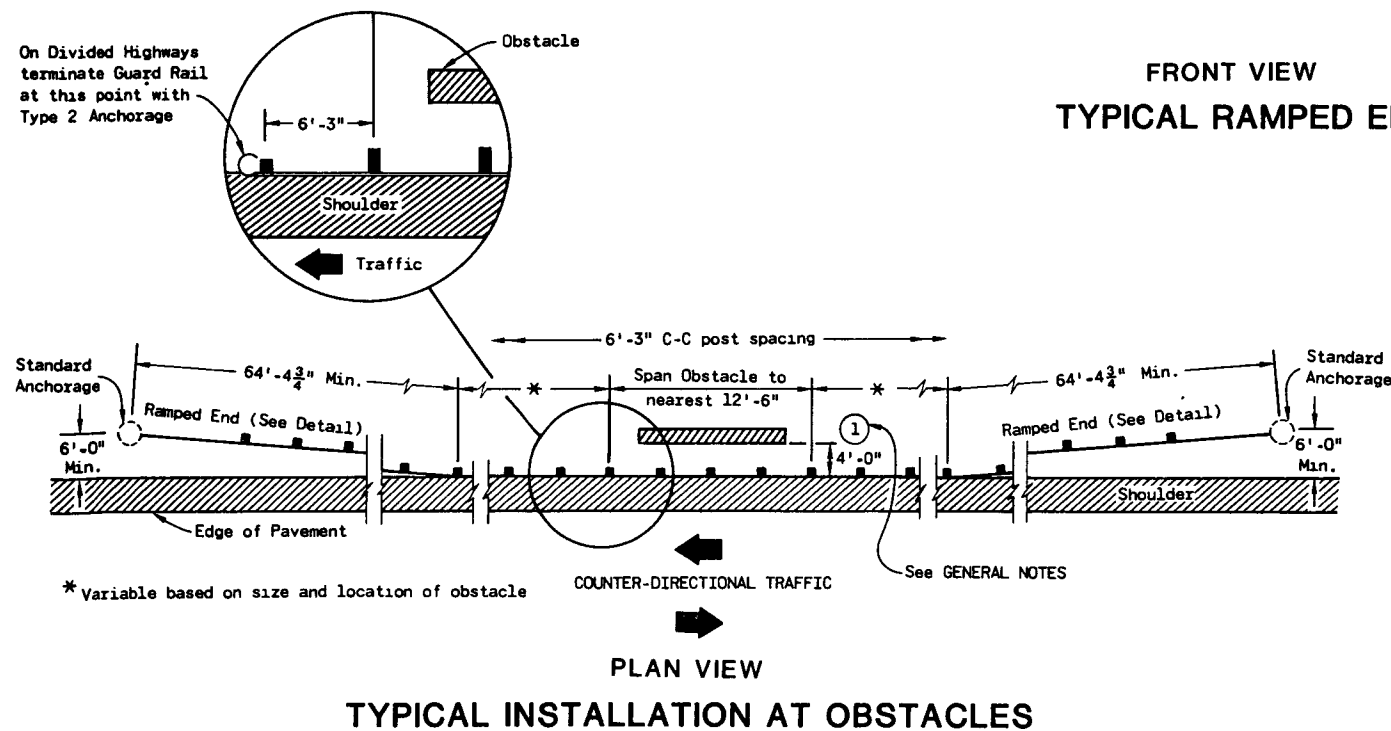
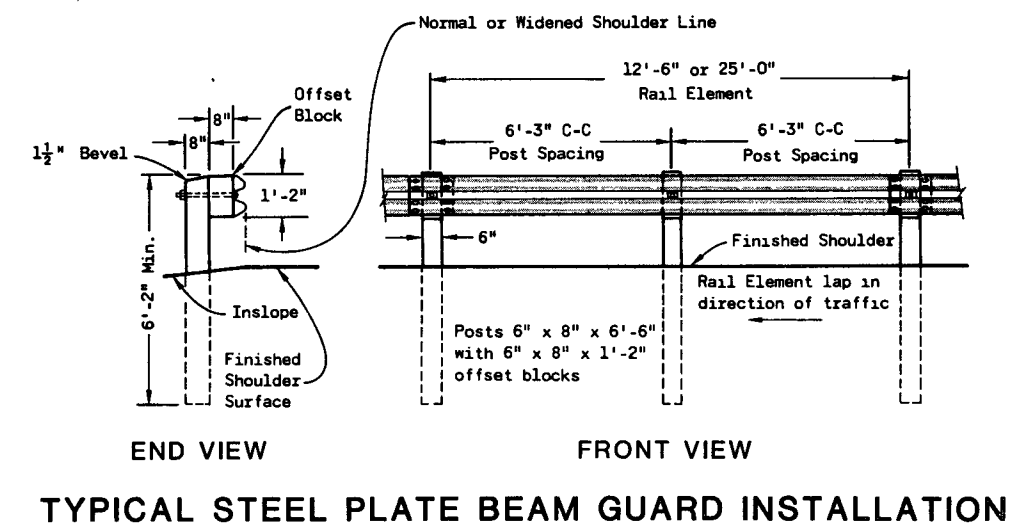
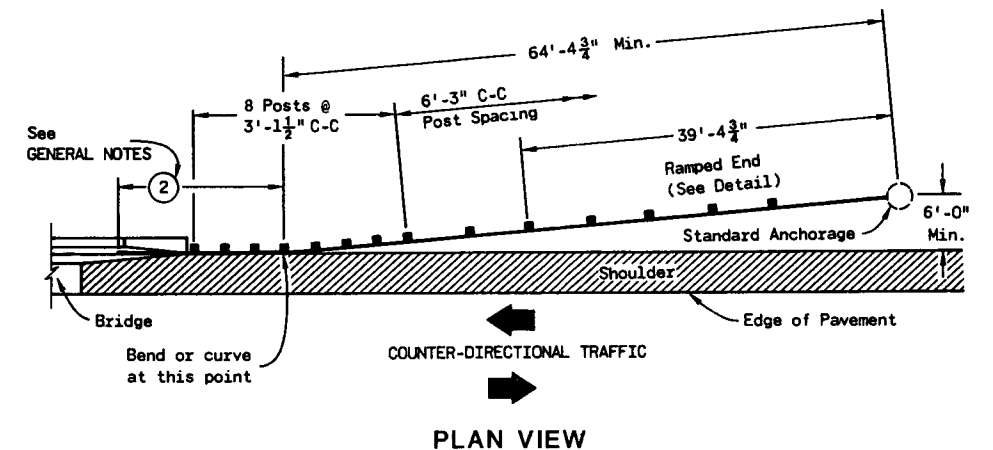
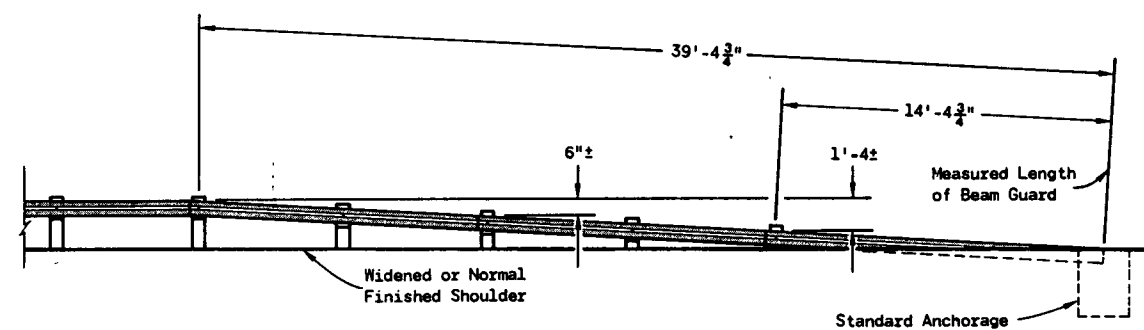
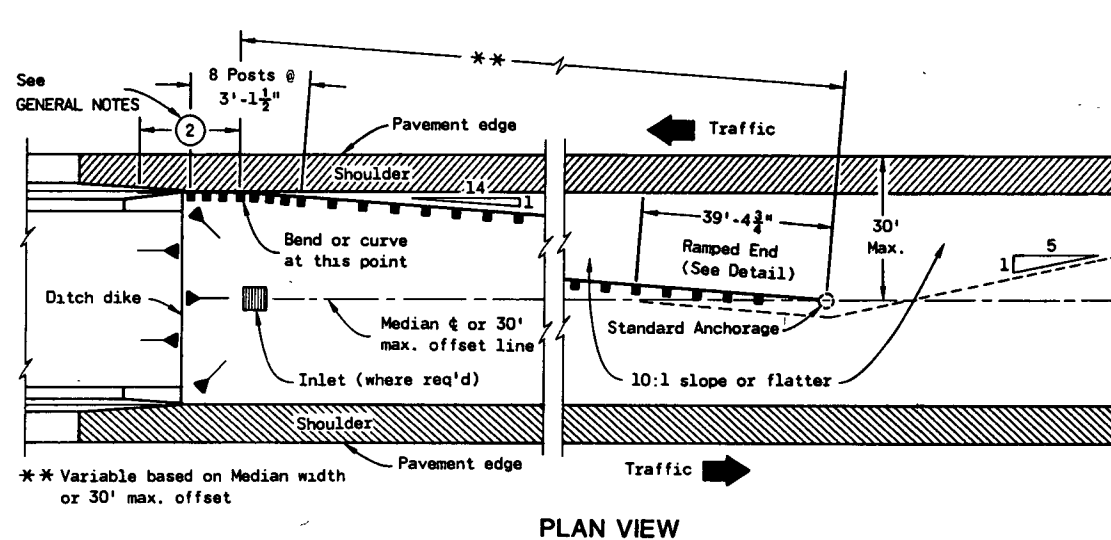
State of Wisconsin
Department of Transportation

APPROVED
11-13-81
DATE

CHIEF DESIGN ENGINEER

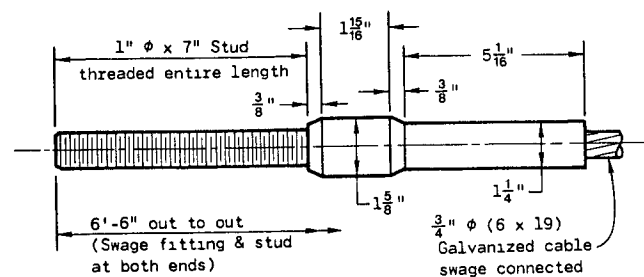


(Standard Specification Item "Anchorage
for Steel Plate Beam Guard")



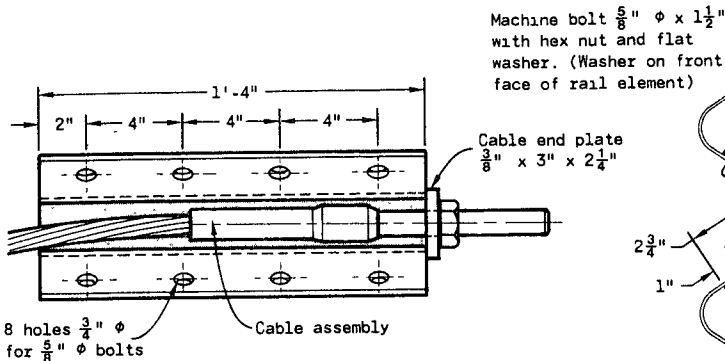
CLASS "A"
STEEL PLATE BEAM GUARD

State of Wisconsin
Department of Transportation



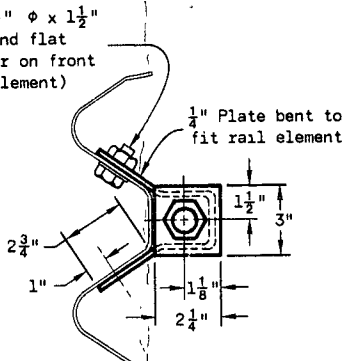
CABLE ASSEMBLY

Cable, Swage Fitting, Stud and Nut shall develop a minimum breaking strength of 40,000 lbs.
(Tighten until taut)

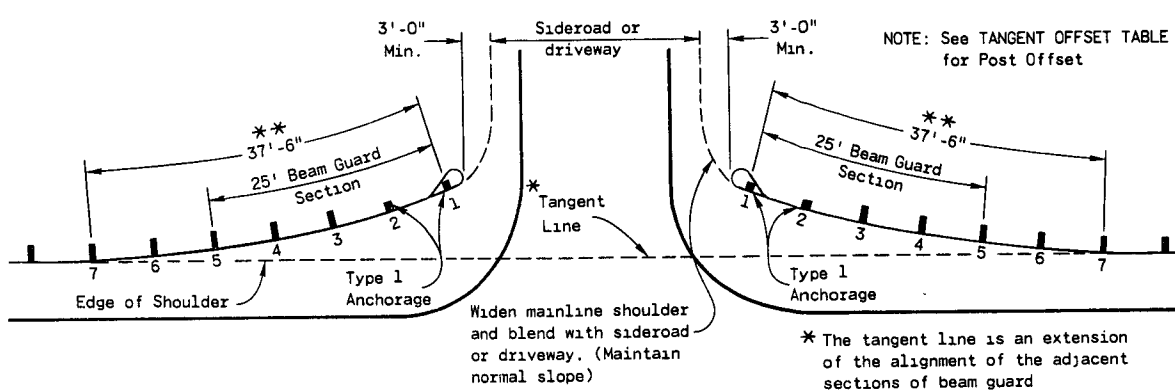


FRONT VIEW

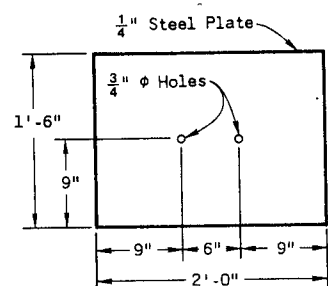
ANCHOR PLATE DETAIL



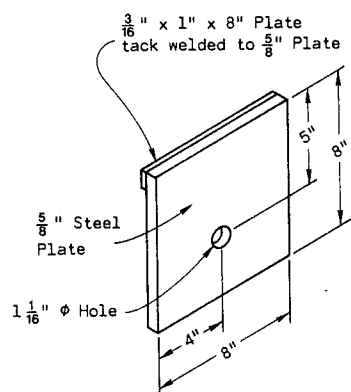
END VIEW



TYPICAL INSTALLATION AT MINOR SIDEROADS OR DRIVEWAYS

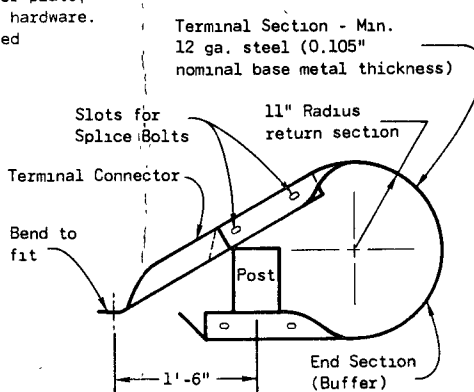


SOIL PLATE



STEEL BEARING PLATE

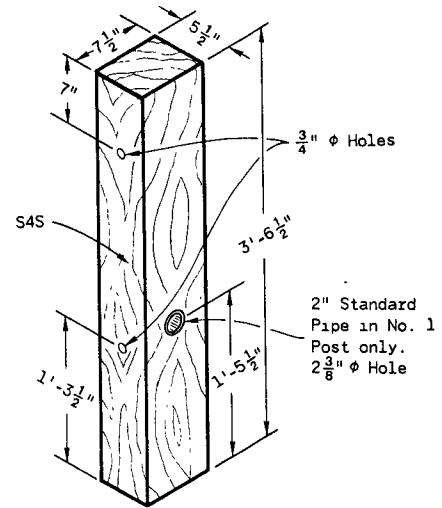
NOTE
Type 1 and Type 2 Anchorages shall consist of steel tube(s), soil plate(s), wood breakaway post(s), bearing plate, anchor plate, cable assembly and all associated hardware. All steel parts shall be galvanized



PLAN VIEW

TERMINAL SECTION DETAIL

NOTE
This Terminal Section Detail illustrates two piece construction. A one piece Terminal Section conforming to this Detail is acceptable

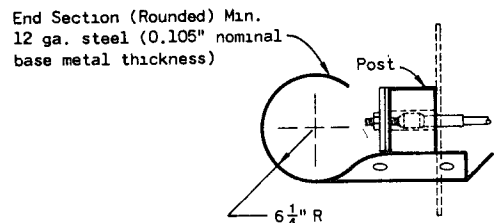


WOOD BREAKAWAY POST

TANGENT OFFSET TABLE	
Post No.	Offset (feet)
1	4.00
2	2.78
3	1.78
4	1.00
5	0.44
6	0.11
7	0.00

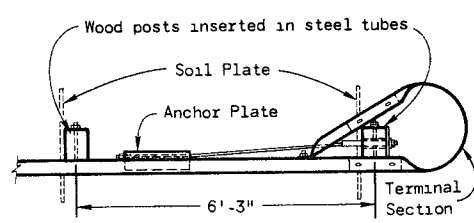
** 37'-6 inch installation, 6 spaces at 6'-3 inch. Plate washers SHALL NOT be used

TANGENT OFFSET TABLE

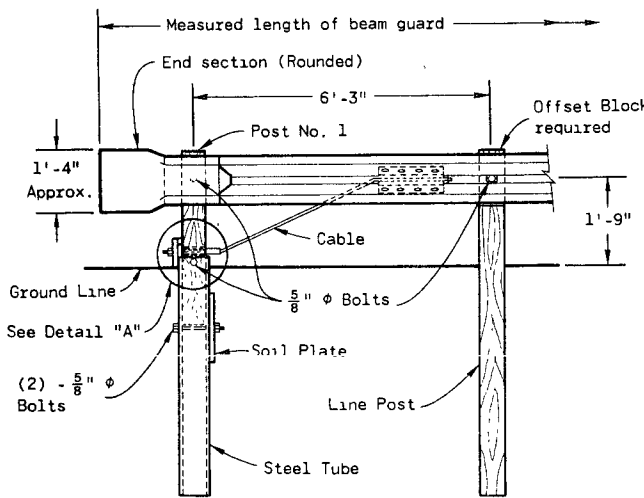


PLAN VIEW

END SECTION (ROUNDED)

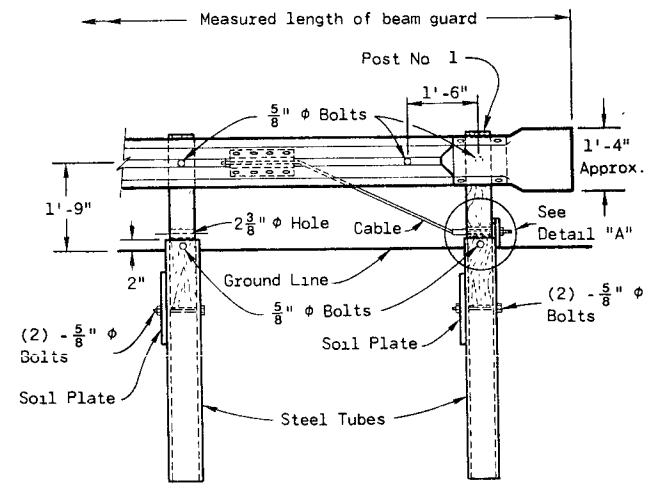


PLAN VIEW



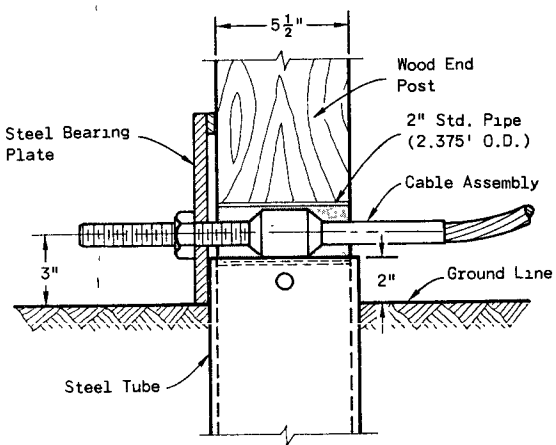
FRONT VIEW

TYPE 2 ANCHORAGE



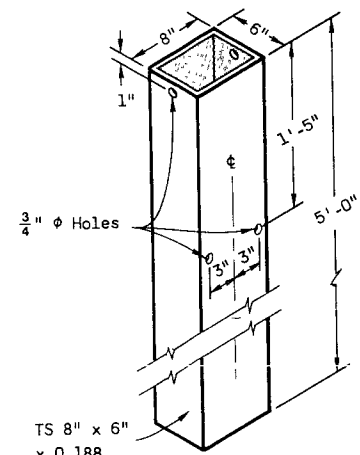
FRONT VIEW

TYPE 1 ANCHORAGE



DETAIL "A"

(Post No. 1)



STEEL TUBE

The steel tube shall conform to requirements of ASTM A501

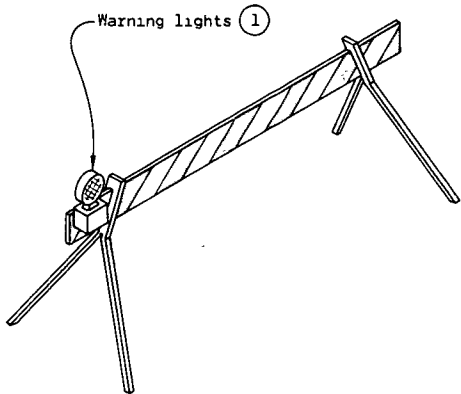
CLASS "A" STEEL PLATE BEAM GUARD

State of Wisconsin
Department of Transportation

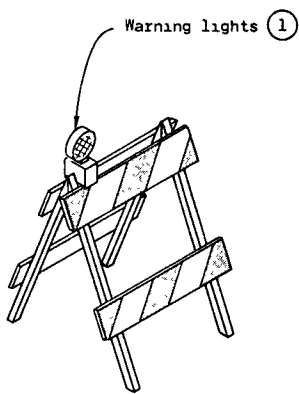
TABLE OF BARRICADE CHARACTERISTICS

BARRICADE TYPE	I	II	III
Height	3' Minimum		5' Minimum
*Rail Width	8" Minimum to 12" Maximum		
Rail Length	2' Minimum		4' Minimum
* *Stripe Width	6" at 45° Angle		
Stripe Colors	Reflectorized Orange & White		

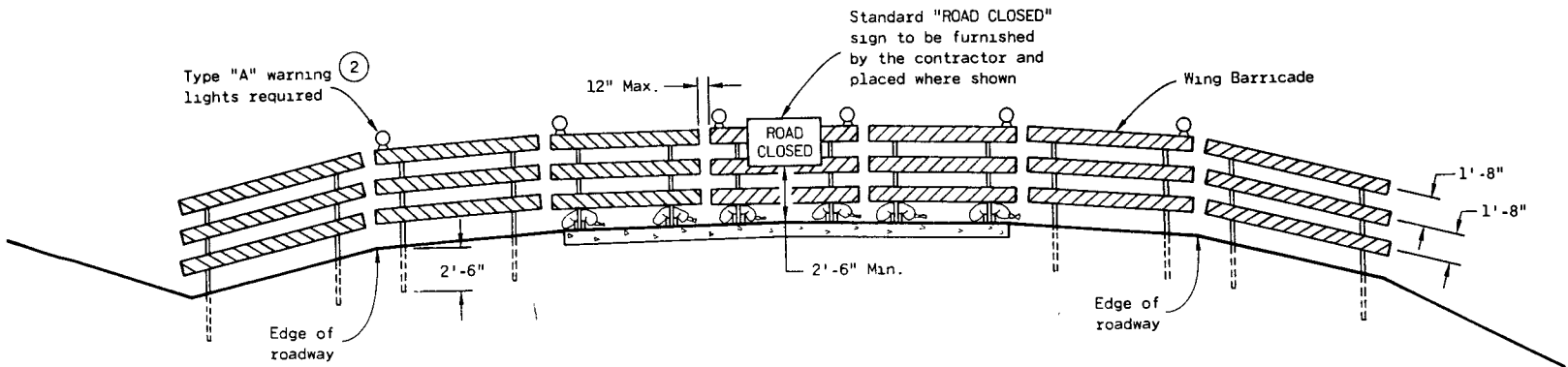
* Nominal dimensions when barricade is constructed of lumber.
* * Shall be 4" for rail lengths less than 3'.



TYPICAL TYPE I BARRICADE



TYPICAL TYPE II BARRICADE



TYPICAL INSTALLATION SHOWING TYPE III BARRICADE
CONSTRUCTION BARRICADES



R11-2

48" x 30"

Black Lettering on Reflective
White Background

Letter Series "D"

Letter height 8"



W20-3

48" x 48"

Black Lettering on Reflective
Orange Background

Letter Series "D"

Letter height 7"

STANDARD SIGNS - TYPE II

GENERAL NOTES

The contractor shall furnish, erect and maintain barricades and signs. Details regarding location, spacing, dimensions, fabrication, material, sign lettering, lighting devices and color of barricades and signs shall conform to this drawing, the Manual On Uniform Traffic Control Devices, the Standard Specifications, Special Provisions and/or plans

Type III Barricades and Signs shall be erected at the termini of projects and at other road or street locations where it is necessary to control or eliminate public access to the construction area.

Type I and II Barricades shall be used on projects when traffic is to be maintained through the construction area.

The actual field location of barricade installations and advance signs shall be as directed by the Engineer.

Each barricade shall have the name and telephone number of a person responsible for 24 hour emergency service printed in letters at least 3/4 inch in height on the barricade rails. Prior to May 1, 1983, such information may be shown on either front or back faces of the barricade rails. After May 1, 1983, all printed information or identification markings shall be shown only on the back side of barricade rails.

Type I Barricades may include other unstriped horizontal panels necessary to provide stability.

On high speed expressways or in other situations where barricades may be susceptible to overturning in the wind, sandbags should be used for ballasting. Sandbags may be placed on lower parts of the frame or stays to provide the required ballast but shall not be placed on top of any striped rail.

- 1 Unless otherwise provided elsewhere in the contract, warning lights are required on all barricades which will be located near traffic operations during periods of inclement weather or hours of darkness. Barricades used to shield isolated hazards shall be equipped with Type "A" (low intensity - flashing) lights unless Type "B" (high intensity) - flashing lights are specified elsewhere in the contract documents. Barricades used for channelization or delineation of the travel path shall be equipped with Type "C" (steady burn) lights except for the initial barricade(s) in sequence, which shall be equipped with Type "A" or "B" lights as previously noted.
- 2 Two warning lights shall be provided on the center barricade and at least one warning light shall be provided on each of the other barricades within the roadway limits. Spacing of the warning lights shall be uniform to the edge of roadway as shown.

CONSTRUCTION BARRICADES
& STANDARD SIGNS

State of Wisconsin
Department of Transportation

APPROVED
9-14-81
DATE

D. J. Strand
CHIEF DESIGN ENGINEER

FHWA