

## GENERAL NOTES

### VANDAL PROTECTION FENCE:

This item shall consist of furnishing all materials, labor, equipment, incidentals, including closure plates as required, necessary to provide for fence retrofits and new fence installations.

Fence shall be provided in reasonably close conformance with lines, grades and locations specified on the plans or established by the Project Engineer.

Construction shall be accomplished in a manner that provides a rigid, taut fence which closely conforms to the top surface of the concrete parapet.

(1) FENCE POSTS shall be 2.875-inch outside diameter pipe, 710.03, Grade 2,  $f_y = 50,000$  p.s.i., 4.64 lbs./ft. Posts shall be coated as per AASHTO M181 and shall be plumb after installation.

(2) FENCE TOP RAILS AND LINE RAILS shall be 1.66 - inch outside diameter pipe, 710.03, Grade 2,  $f_y = 50,000$  p.s.i., 1.84 lbs./ft. The protective coating shall be the same as that for AASHTO M181, Grade 2 fence posts.

(3) BASE PLATES shall be ASTM A36 steel galvanized as per 711.02

(4) THREE-QUARTERS (3/4) " DIA. HIGH STRENGTH THREADED ANCHORS, nuts and washers shall meet the requirements of ASTM A325.

All hardware shall be galvanized as per 711.02 3/4" dia. threaded anchors shall be doweled 6 3/8 inches min. into existing or new concrete and shall project a minimum of 2 3/4" above the top of parapet. They shall be secured with vinyl ester resin or epoxy mortar as per Supplemental Specifications 852 & 952. Anchor hole diameter shall be 1/8" larger than the anchor unless recommended otherwise by the manufacturer.

As an option with new parapets, the anchors may be cast-in-place with 6 3/8 inches min. of embedment or installed in threaded ferrule concrete inserts unless otherwise indicated. The inserts shall be approved by the Director.

(5) THREE QUARTERS (3/4) " DIA. HIGH STRENGTH BOLTS, nuts and washers shall meet the requirements of ASTM A325. All hardware shall be galvanized as per 711.02.

(6) TENSION BARS shall be 3/16-inch by 1/2-inch steel galvanized as per 711.02.

(7) TENSION BANDS AND BRACE BANDS shall be 1/8-inch x 1-inch galvanized steel assembled with 3/8-inch diameter by 1 1/4-inch galvanized bolts. One tension band shall be supplied for each foot of fabric height. Bands shall be galvanized as per 711.02.

(8) LINE RAIL CLAMPS OR BOULEVARDS shall be steel galvanized as per 711.02. These clamps shall be used to connect line rails or top rails of curved fences to interior posts. Installation shall be made using 3/8-inch diameter by 2 1/2-inch bolts galvanized as per 711.02.

(9) WALLEABLE OR CAST IRON FITTINGS shall be used for end post dome caps, half ball and loop line post caps and line or top rail ends. All fittings shall be galvanized as per 711.02.

(10) TENSION WIRE shall be aluminumized 0.177-inch diameter steel coil spring wire conforming to AASHTO M181. Tension wire shall be spaced as close to the concrete parapet as practicable but the location dimension shall not exceed two inches maximum. The load on tension wire shall be 800 lb. minimum.

(11) FABRIC TIES AND HOG RINGS shall be 0.148-inch core diameter galvanized PVC-coated steel wire and 0.120-inch A478 annealed stainless steel wire respectively.

One fabric tie shall be supplied for each foot of fabric height to connect fabric to the line posts. To connect the fabric to the tension wire, use hog rings 2 to 3 inches on each side of and at spacings not exceeding 12 inches center to center between posts. PVC coating shall be the same as that for the steel fabric.

(12) STAINLESS STEEL CLOSURE PLATES as shown on sheet 6 are required for all fencing installations not using a bottom rail as shown in PS-4. Materials and installation of the stainless steel closure plates shall conform to requirements as per sheet 6 of 6.

(13) ADJUSTABLE TRUSS RODS shall be 3/8-inch diameter steel galvanized as per 711.02 and shall have suitable adjustment.

(14) DOUBLE WRAP FABRIC TIES shall be 0.091-inch core diameter galvanized PVC-coated steel wire 15 1/4 inches long. To connect fabric to the line and top rails, use double wrap ties 2 to 3 inches on each side of posts and at spacings not to exceed 12 inches center to center between posts. The PVC coating shall be the same as that for the steel fabric.

(15) STEEL FABRIC: The 11 gage core wires shall be uniformly galvanized with zinc metal of 0.30 oz./ft<sup>2</sup> minimum weight in accordance with ASTM A641-82. The galvanized wire shall then be PVC coated in accordance with ASTM F668-84, Class 2a or 2b with the following changes:

a) The coating shall be virgin PVC of 22 mils thickness for Class 2a and 7 mils for class 2b.

b) The PVC coating shall be gray in color closely approaching Federal Standard No. 595a - 16251 unless otherwise specified in the plans.

c) The finished fabric shall be composed of a 1-inch diamond pattern in which the individual pickets are helically woven and interwoven in the form of a continuous chain-link mesh with knuckled selvages.

d) All PVC coated fabric shall be handled with care. If the PVC coating is damaged, the Contractor shall replace the fabric or repair the PVC coating as directed by the Project Engineer at no cost to the Department.

(16) FILLET WELDS shall conform to 513.17.

(17) SLEEVES shall be 3.500-inch outside diameter pipe ASTM A53, Grade 1,  $f_y = 25,000$  p.s.i., 7.58 lbs./ft., and shall be galvanized as per 711.02. Sleeves shall be plumb after installation.

(18) SHIM PLATES shall be made from any multi-polymer plastic with a minimum compressive strength of 5,000 p.s.i. For post plumbness, ends of posts and sleeves may be cut on a bias.

(19) TRAFFIC MAINTENANCE: Traffic shall be maintained as per Project Plans.

(20) CAULKING COMPOUND shall meet Federal Specification TT-S-002335 Type II, Class A, aluminum gray. Provide 1" opening through caulking on low side of base plate.

(21) CONSTRUCTION PROCEDURE:

1. Field verify all plan base plate locations and mark parapets.
2. Mark and drill holes for 3/4-inch H.S. Threaded Anchors, 3/4-inch Bolts, or 3/4-inch Inserts using a base plate or template.
3. Install 3/4-inch dia. H.S. Threaded Anchors, 3/4-inch Bolts, or 3/4-inch Inserts.
4. Install and shim (if necessary) posts and base plates.
5. Seal along edges of base plates, shims, and sleeves with caulking compound.
6. Complete installation of fence.

(22) METHOD OF MEASUREMENT: Fence shall be measured by the linear foot, complete in place. Measurement shall be along the bottom of fence from center to center of end posts.

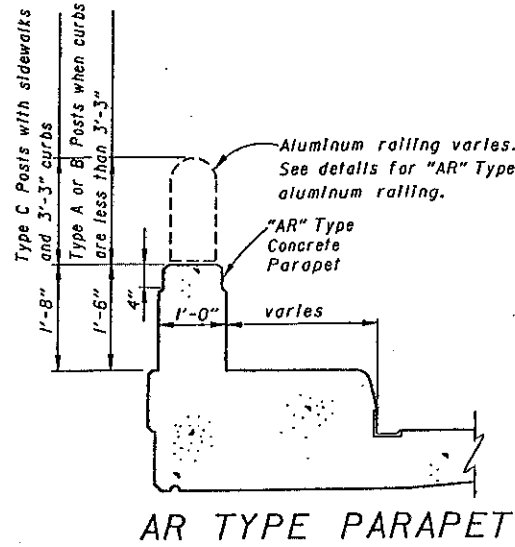
(23) BASIS OF PAYMENT: The accepted quantities of fence or parapet and fence measured, will be paid for under:

Item	Unit	Description
Special	Linear Foot	Vandal protection fence, *
* : 6 ft. straight, coated fabric		
8 ft. straight, coated fabric		
10 ft. curved, coated fabric		
12 ft. curved, coated fabric		

(24) WHEN FENCE VERTICAL HEIGHT LOCATION EXCEEDS 50 FT. above the normal terrain, there shall be a special design for the fence. Maximum Wind Velocity = 80 mph plus 30% Gust Factor.

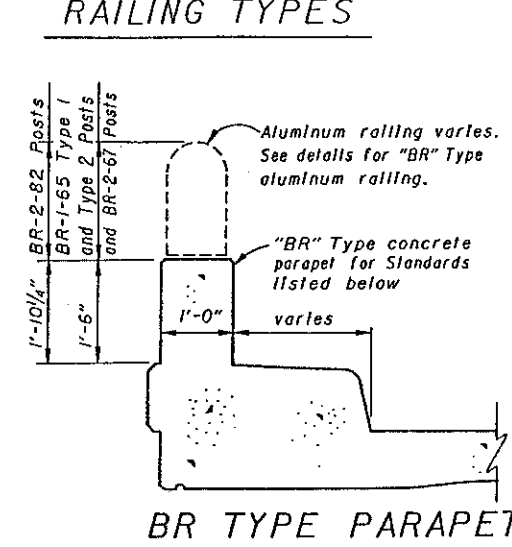
(25) PROJECT PLANS shall show a schematic deck plan for fence post spacing together with a tabulation of fence post spacings and required Base Plate and Post Section types for each bridge.

## RAILING TYPES



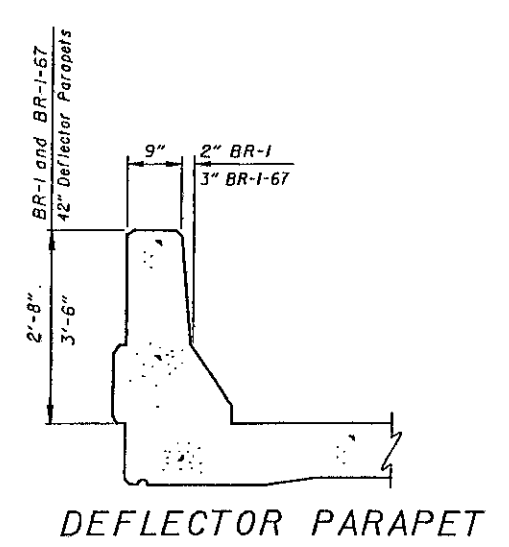
AR TYPE PARAPET

See Standard Drawing AR-1-57. Use curved fence or straight 8'-0" high fence as determined by curb or sidewalk width and and Base Plates BP-1, BP-2, BP-3 or BP-4.



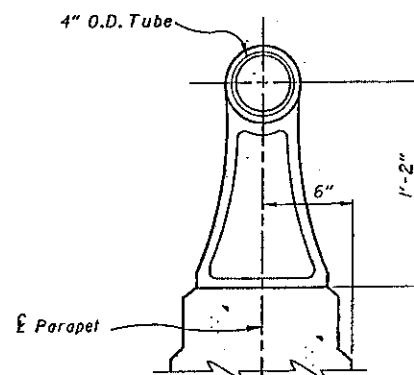
BR TYPE PARAPET

See Standard Drawings BR-2-82, BR-2-67 and BR-1-65. Use curved fence or straight 8'-0" high fence as determined by curb or sidewalk width and Base Plate BP-1.

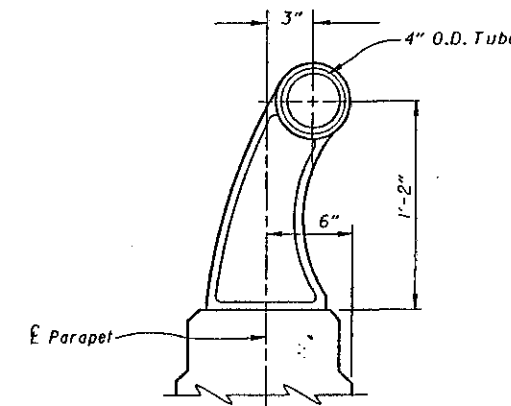


DEFLECTOR PARAPET

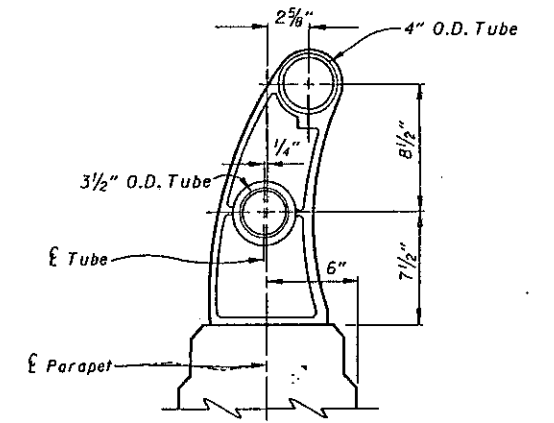
See Standard Drawings BR-1 & BR-1-67 and 42" Deflector Parapet. Use straight 6'-0" high fence and Base Plate BP-5.



Aluminum railing for Standard Drawing AR-1-57 with Type A Posts

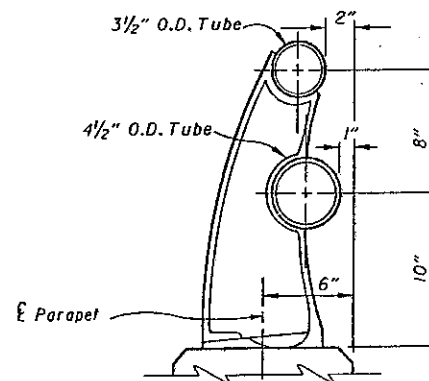


Aluminum railing for Standard Drawing AR-1-57 with Type B Posts

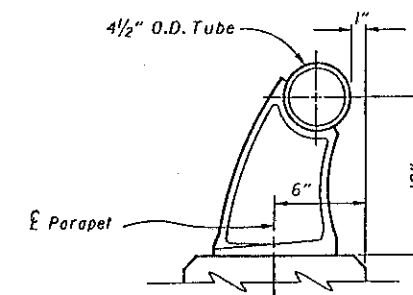


Aluminum railing for Standard Drawing AR-1-57 with Type C Posts

## AR TYPE ALUMINUM RAILING



Aluminum railing for Standard Drawings BR-2-82, BR-2-67 and BR-1-65 with Type 2 Posts



Aluminum railing for Standard Drawing BR-1-65 with Type 1 Posts

## BR TYPE ALUMINUM RAILING

Base plate threaded anchors are designed for a minimum concrete strength of  $f'_c = 4,000$  p.s.i., special designs required for concrete strengths less than this.

REVISIONS		STATE OF OHIO DEPARTMENT OF TRANSPORTATION BUREAU OF BRIDGES AND STRUCTURAL DESIGN STANDARD	
REV. 2-1-92		VANDAL PROTECTION FENCE	
REV. 3-24-93		GENERAL NOTES AND RAILING TYPES	
APPROVED:	<i>Bob Hamilton</i> ENGINEER OF BRIDGES	DRAWING NO.	VPF-1-90
DATE: 9-26-90		PREPARED	JCR
		DRAWN	GFJ
		CHECKED	RLD
		REVIEWED	WTF
		SHEET NO. 1	OF 6 SHEETS