

GENERAL NOTES FOR VANDAL PROTECTION FENCE

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 73.0 mm OUTSIDE DIAMETER PIPE, 710.03, GRADE 2, $F_y = 345$ MPa, 6.90 kg/m. POSTS SHALL BE COATED AS PER AASHTO M181 AND SHALL BE PLUMB AFTER INSTALLATION.

(2) FENCE TOP RAILS AND LINE RAILS SHALL BE 42.2 mm OUTSIDE DIAMETER PIPE, 710.03, GRADE 2, $F_y = 345$ MPa, 2.74 kg/m. THE PROTECTIVE COATING SHALL BE THE SAME AS THAT FOR AASHTO M181, GRADE 2 FENCE POSTS.

(3) BASE PLATES SHALL BE ASTM A36M STEEL GALVANIZED AS PER 711.02.

(4) 20 mm DIAMETER HIGH STRENGTH THREADED ANCHORS, NUTS AND WASHERS SHALL MEET THE REQUIREMENTS OF ASTM A325M. ALL HARDWARE SHALL BE GALVANIZED AS PER 711.02. 20 mm DIAMETER THREADED ANCHORS SHALL BE DOWELED 170 mm MINIMUM INTO EXISTING OR NEW CONCRETE AND SHALL PROJECT A MINIMUM OF 70 mm ABOVE THE TOP OF PARAPET. THEY SHALL BE SECURED WITH VINYLESTER RESIN OR EPOXY MORTAR AS PER 705.20 AND SUPPLEMENTAL SPECIFICATIONS 952. ANCHOR HOLE DIAMETER SHALL BE 3 mm LARGER THAN THE ANCHOR UNLESS RECOMMENDED OTHERWISE BY THE MANUFACTURER.

AS AN OPTION WITH NEW PARAPETS THE ANCHORS MAY BE CAST-IN-PLACE WITH 170 mm MINIMUM OF EMBEDMENT OR INSTALLED IN THREADED FERRULE CONCRETE INSERTS UNLESS OTHERWISE INDICATED. THE INSERTS SHALL BE APPROVED BY THE DIRECTOR.

(5) 20 mm DIAMETER HIGH STRENGTH BOLTS, NUTS AND WASHERS SHALL MEET THE REQUIREMENTS OF ASTM A325M. ALL HARDWARE SHALL BE GALVANIZED AS PER 711.02.

(6) TENSION BARS SHALL BE 5 mm BY 13 mm STEEL GALVANIZED AS PER 711.02.

(7) TENSION BANDS AND BRACE BANDS SHALL BE 3 mm x 25 mm GALVANIZED STEEL ASSEMBLED WITH 10 mm DIAMETER BY 32 mm GALVANIZED BOLTS. ONE TENSION BAND SHALL BE SUPPLIED FOR EACH 300 mm 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 10 mm DIAMETER BY 65 mm BOLTS GALVANIZED AS PER 711.02.

(9) MALLEABLE 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 ALUMINIZED 4.5 mm DIAMETER STEEL COIL SPRING WIRE CONFORMING TO AASHTO M181. TENSION WIRE SHALL BE PLACED AS CLOSE TO THE CONCRETE PARAPET AS PRACTICAL BUT THE LOCATION DIMENSION SHALL NOT EXCEED 50 mm MAXIMUM. THE LOAD ON TENSION WIRE SHALL BE 3600 N MINIMUM.

(11) FABRIC TIES AND HOG RINGS SHALL BE 3.76 mm CORE DIAMETER GALVANIZED PVC-COATED STEEL WIRE AND 3.05 mm A478 ANNEALED STAINLESS STEEL WIRE RESPECTIVELY. ONE FABRIC TIE SHALL BE SUPPLIED FOR EACH 300 mm OF FABRIC HEIGHT TO CONNECT FABRIC TO THE LINE POSTS. TO CONNECT THE FABRIC TO THE TENSION WIRE USE HOG RINGS 50 mm TO 75 mm ON EACH SIDE OF POSTS, AND AT SPACINGS NOT EXCEEDING 300 mm 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 7 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 7 OF 7.

(13) ADJUSTABLE TRUSS RODS SHALL BE 10 mm DIAMETER STEEL GALVANIZED AS PER 711.02 AND SHALL HAVE SUITABLE ADJUSTMENT.

(14) DOUBLE WRAP FABRIC TIES SHALL BE 2.31 mm CORE DIAMETER GALVANIZED PVC-COATED STEEL WIRE, 387 mm LONG. TO CONNECT FABRIC TO THE LINE AND TOP RAILS, USE DOUBLE WRAP TIES 50 mm TO 75 mm ON EACH SIDE OF POSTS AND AT SPACINGS NOT TO EXCEED 300 mm CENTER TO CENTER BETWEEN POSTS. THE PVC COATING SHALL BE THE SAME AS THAT FOR THE STEEL FABRIC.

(15) STEEL FABRIC: THE 3.05 mm CORE WIRES SHALL BE UNIFORMLY GALVANIZED WITH ZINC METAL OF 92 g/m² MINIMUM WEIGHT IN ACCORDANCE WITH ASTM A641M. THE GALVANIZED WIRE SHALL THEN BE PVC COATED IN ACCORDANCE WITH ASTM F668, CLASS 2a OR 2b WITH THE FOLLOWING CHANGES:

A) THE COATING SHALL BE VIRGIN PVC OF 560 MICROMETERS THICKNESS FOR CLASS 2a AND 180 MICROMETERS 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 25 mm 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 88.9 mm OUTSIDE DIAMETER PIPE IN ACCORDANCE WITH ASTM A53, GRADE 1, $F_y = 170$ MPa, 11.29 kg/m, 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 35 MPa. 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-00233S TYPE II, CLASS A, ALUMINUM GRAY. PROVIDE 25 mm OPENING THROUGH CAULKING ON LOW SIDE OF BASE PLATE.

(21) CONSTRUCTION PROCEDURE:

1. FIELD VERIFY ALL BASE PLATE LOCATIONS PER PLAN AND MARK PARAPETS ACCORDINGLY.
2. MARK AND DRILL HOLES FOR 20 mm HIGH STRENGTH THREADED ANCHORS, 20 mm BOLTS, OR 20 mm INSERTS USING A BASE PLATE OR TEMPLATE.
3. INSTALL 20 mm DIAMETER HIGH STRENGTH THREADED ANCHORS, 20 mm BOLTS, OR 20 mm INSERTS.
4. INSTALL POSTS AND BASE PLATES, AND SHIM AS REQUIRED.
5. CAULK 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 METER, 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 METER VANDAL PROTECTION FENCE, <u>±</u>		
		*: 1850 mm STRAIGHT, COATED FABRIC
		2450 mm STRAIGHT, COATED FABRIC
		3050 mm CURVED, COATED FABRIC
		3650 mm CURVED, COATED FABRIC

(24) WHEN FENCE VERTICAL HEIGHT LOCATION EXCEEDS 15 m ABOVE THE NORMAL TERRAIN, THERE SHALL BE A SPECIAL DESIGN FOR THE FENCE. MAXIMUM WIND VELOCITY EQUALS 130 km/hr 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.

STANDARD DRAWING VANDAL PROTECTION FENCE GENERAL NOTES AND RAILING TYPES	REVISIONS PREPARED JCR DRAWN GEJ/RJS	CHECKED RLD DRAWING NO. VPF-1-90M	REVIEWED WTF/LMW	STATE OF OHIO DEPARTMENT OF TRANSPORTATION BUREAU OF BRIDGES AND STRUCTURAL DESIGN DATE 5-20-95 ENGINEER OF BRIDGES [Signature]
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