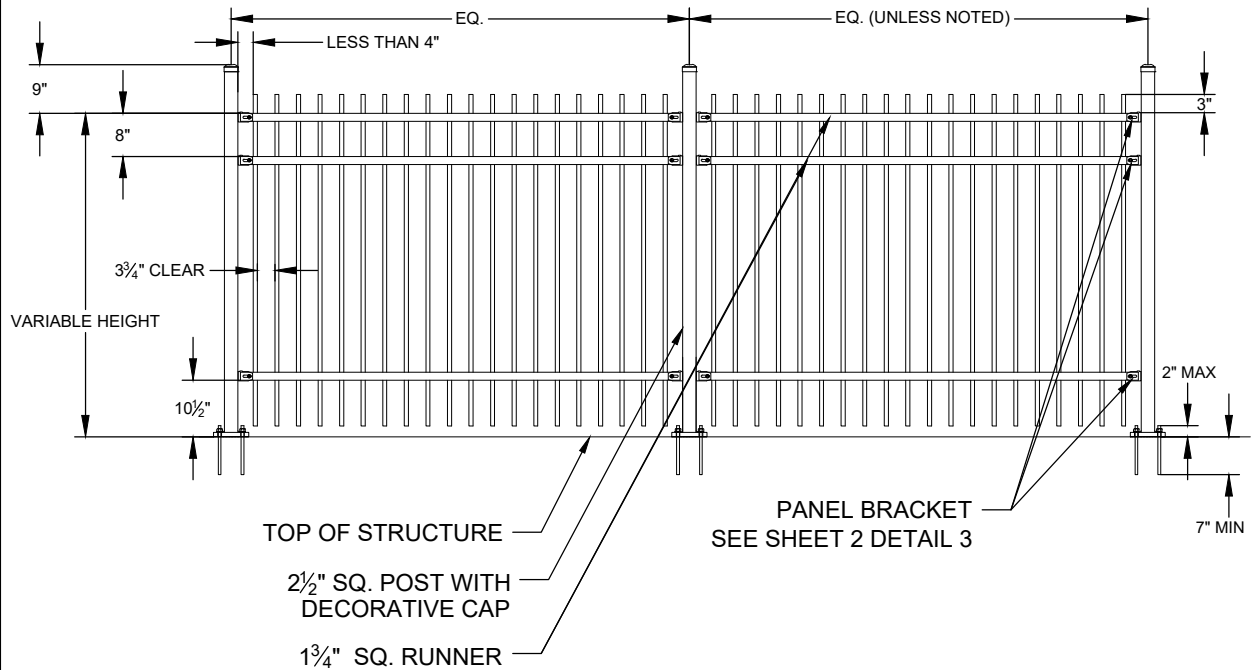
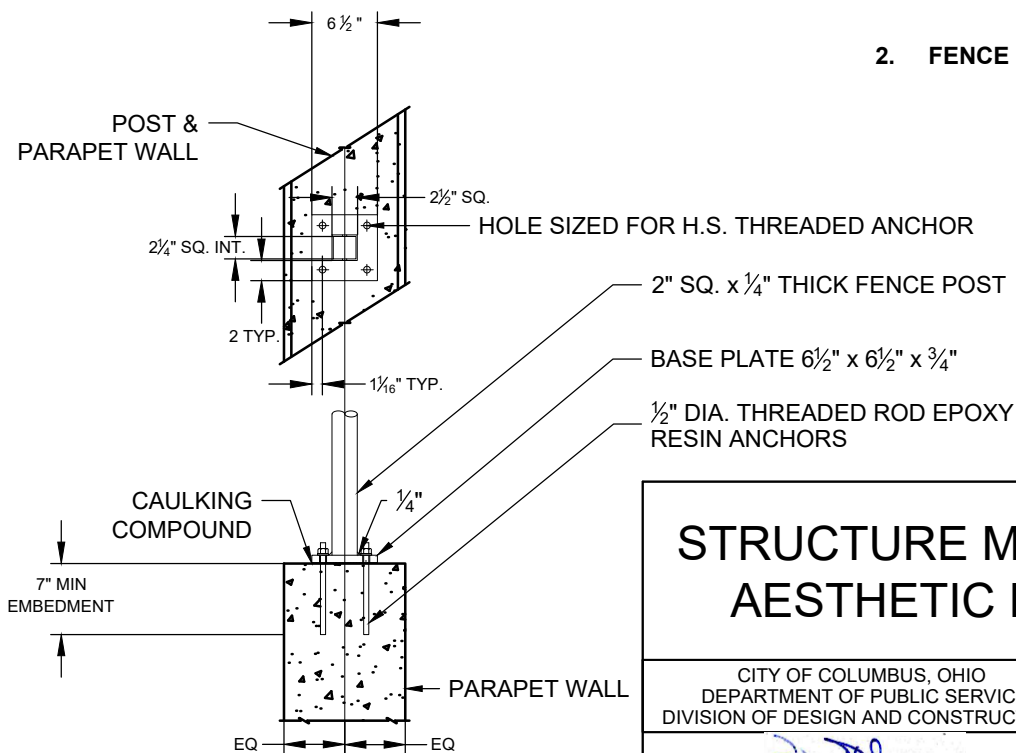


## 1. AESTHETIC FENCE

NOTE: 7'-0" IS THE MAXIMUM FENCE PANEL LENGTH.



## 2. FENCE POST MOUNTING



## STRUCTURE MOUNTED AESTHETIC FENCE

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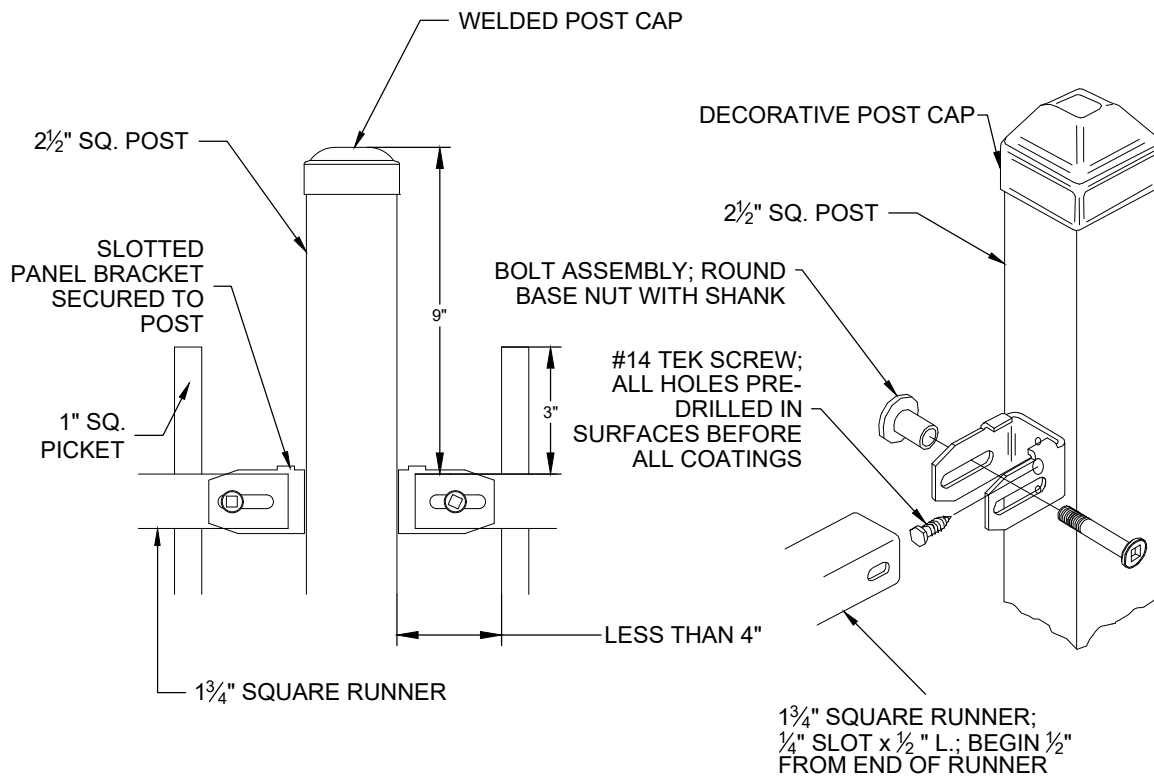
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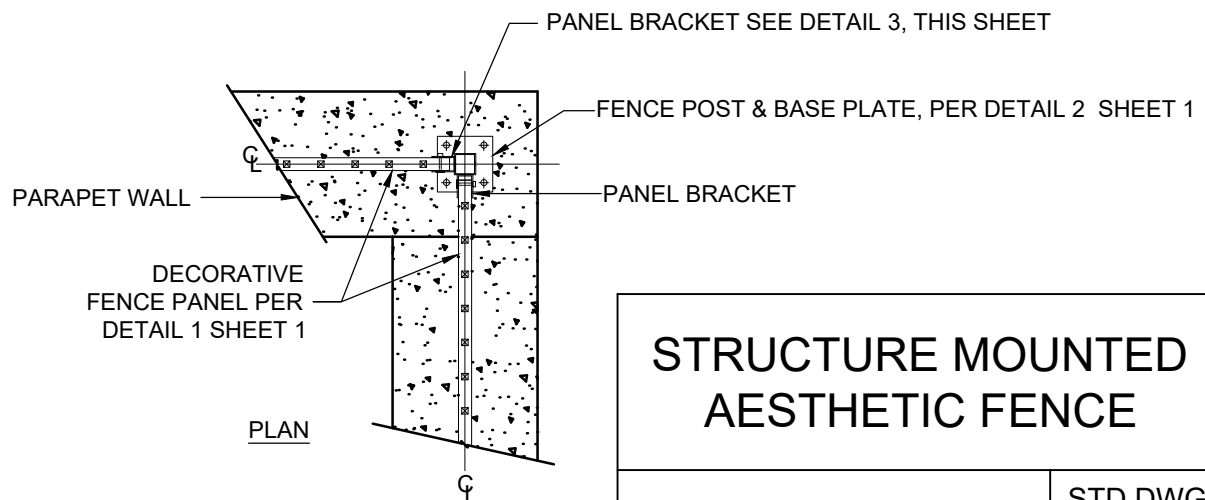
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### 3. SLIP JOINT



### 4. FENCE POST AT CORNER



## STRUCTURE MOUNTED AESTHETIC FENCE

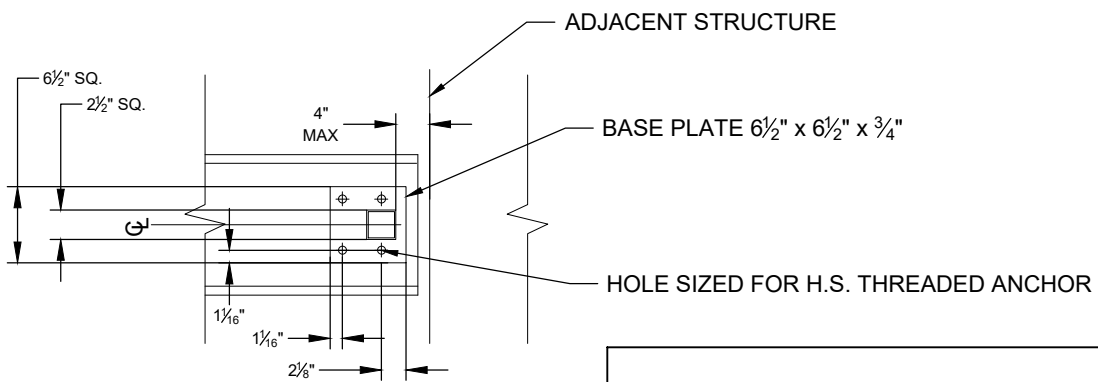
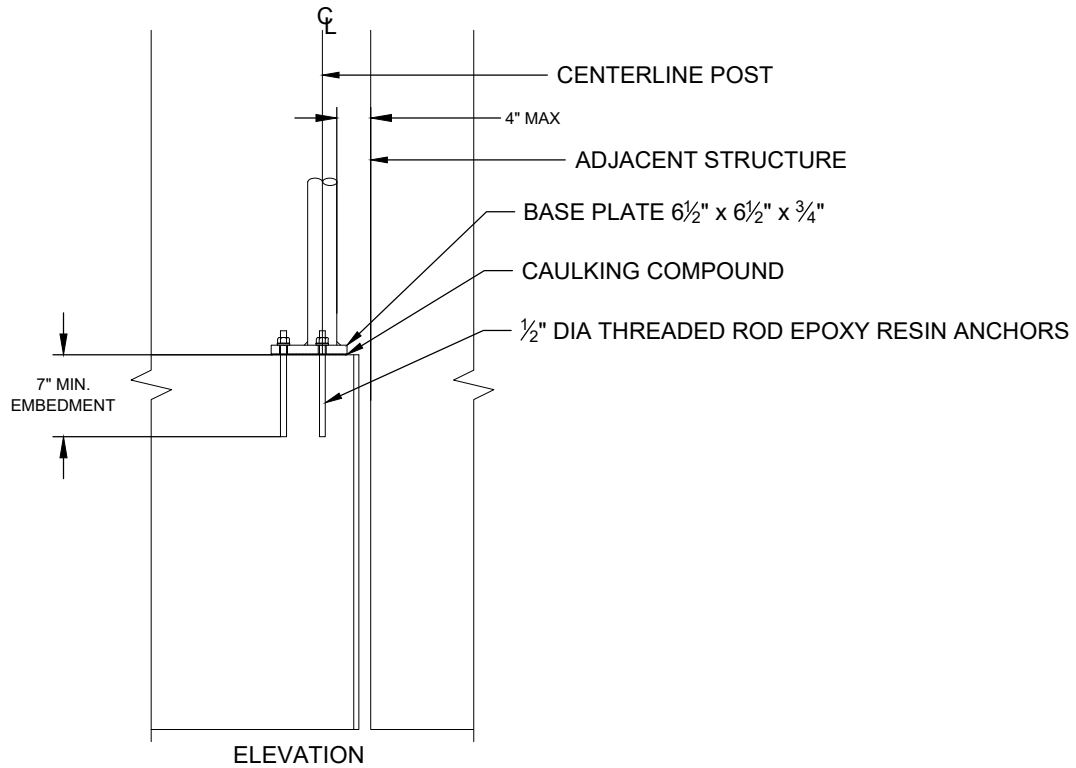
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## 5. ALTERNATE POST MOUNTING AT ADJACENT STRUCTURE



## STRUCTURE MOUNTED AESTHETIC FENCE

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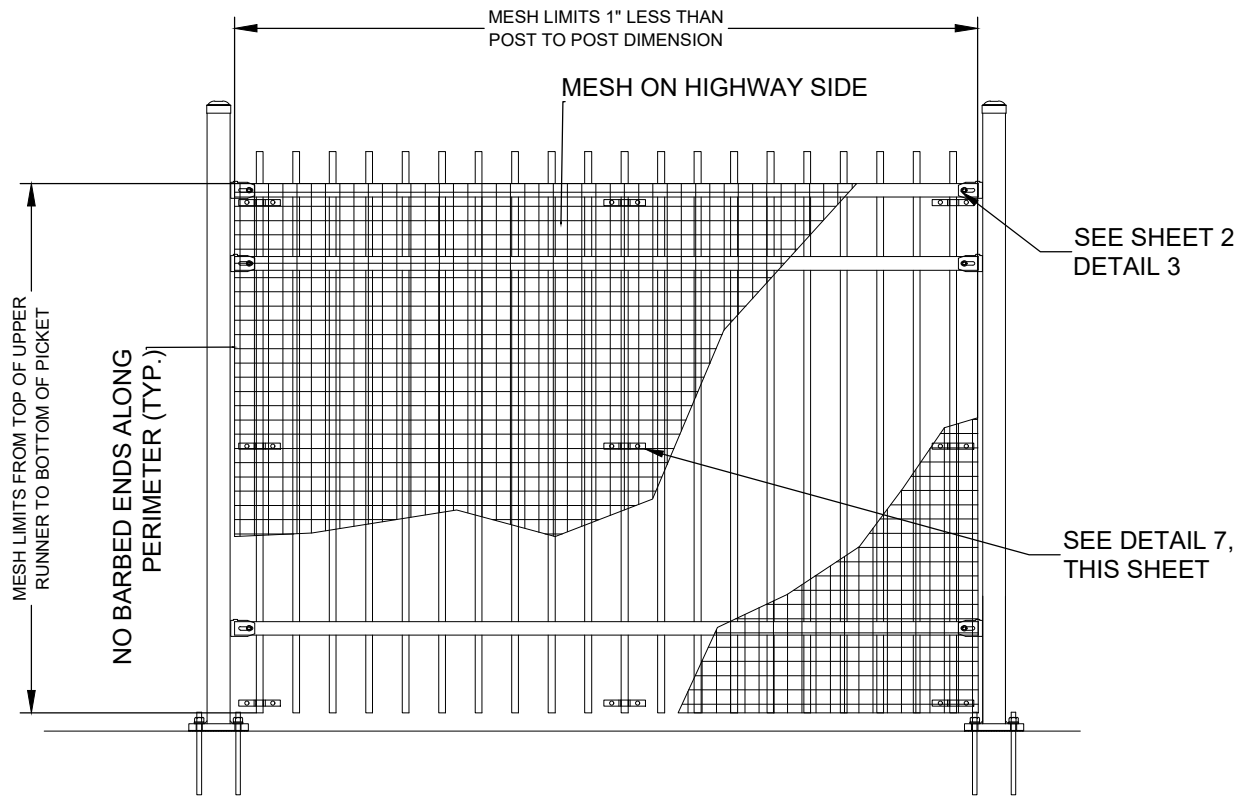
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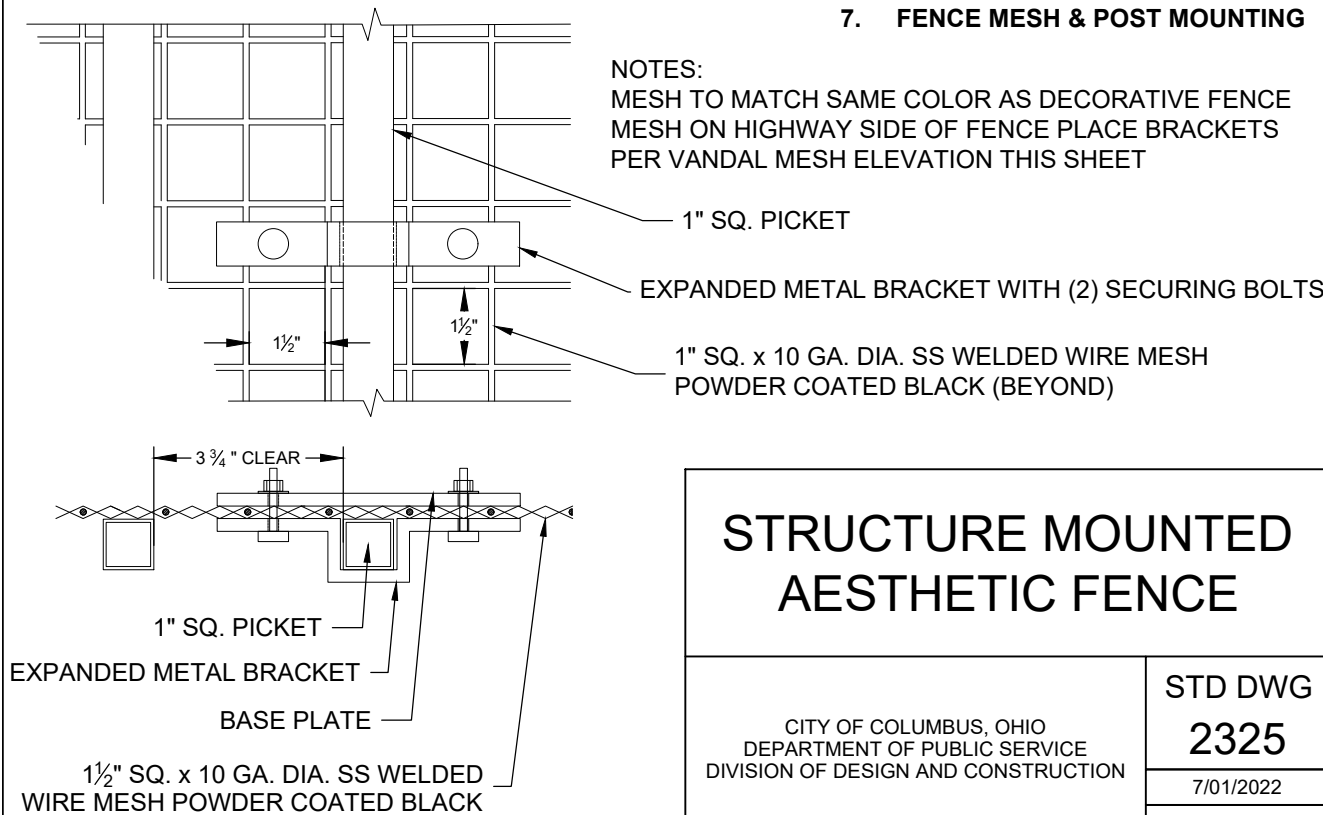
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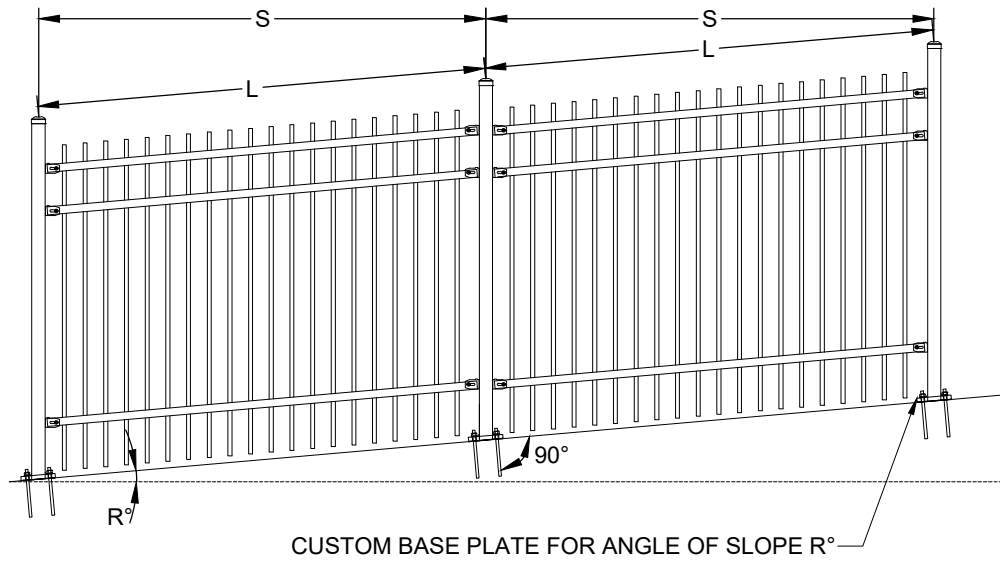
6. FENCE MESH & POST MOUNTING



7. FENCE MESH & POST MOUNTING



## 8. FENCE ON SLOPED STRUCTURE



NOTE: MAXIMUM ANGLE  $R^\circ$  IS  $15^\circ$

NOTE:  $S = L \cdot \cos(R^\circ)$

## STRUCTURE MOUNTED AESTHETIC FENCE

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## GENERAL NOTES

### AESTHETIC FENCE

#### 1.0 DESCRIPTION:

THIS ITEM CONSISTS OF FURNISHING AND INSTALLING STRUCTURE MOUNTED AESTHETIC FENCING ON NEW AND EXISTING CONCRETE BRIDGE PARAPETS OR RETAINING WALLS.

#### 1.1 METHOD OF MEASUREMENT:

FENCE SHALL BE MEASURED BY THE LINEAR FOOT ALONG THE BOTTOM OF THE FINISHED FENCE FROM CENTER TO CENTER OF POSTS.

#### 1.2 BASIS OF PAYMENT:

QUANTITIES AND PAYMENT WILL BE INCLUDED WITH INDIVIDUAL BRIDGE/WALL STRUCTURES. THE DEPARTMENT WILL MAKE PAYMENT FOR THE COMPLETED AND ACCEPTED QUANTITIES AS FOLLOWS:

ITEM	UNIT	DESCRIPTION
607	LINEAR FOOT	FENCE, MISC.: WALL MOUNTED TYPE A (W/O VANDAL MESH)
607	LINEAR FOOT	FENCE, MISC.: WALL MOUNTED TYPE A (W/VANDAL MESH)
607	EACH	GATE, TYPE _____

#### 1.3 PROJECT PLANS:

THE DESIGNER SHALL SPECIFY THE FENCE HEIGHT IN THE PROJECT PLANS.

#### 1.4 SPECIAL DESIGNS

SPECIAL DESIGNS ARE REQUIRED FOR STRUCTURE TYPES OTHER THAN REINFORCED CONCRETE OR IF THE PARAPET WALL CONSTRUCTION HAS A 28 DAY COMPRESSIVE STRENGTH LESS THAN 4000 PSI. A SPECIAL DESIGN IS ALSO REQUIRED IF THE MIDPOINT OF THE EXPOSED FENCE HEIGHT IS GREATER THAN 50 FEET ABOVE THE NORMAL TERRAIN ELEVATION.

#### 1.5 SYSTEM DESCRIPTION:

THE MANUFACTURER SHALL SUPPLY A COMPLETE INDUSTRIAL GRADE ORNAMENTAL STEEL FENCE SYSTEM PER THE DRAWINGS AND SPECIFICATIONS. THE SYSTEM SHALL INCLUDE ALL COMPONENTS (I.E., PICKETS, RAILS, POSTS, VANDAL MESH WHERE REQUIRED, BASE PLATES, GATES AND HARDWARE).

#### 1.6 QUALITY ASSURANCE:

THE CONTRACTOR SHALL PROVIDE LABORERS AND SUPERVISORS WHO ARE THOROUGHLY FAMILIAR WITH THE TYPE OF CONSTRUCTION INVOLVED AND MATERIALS AND TECHNIQUES SPECIFIED.

#### 1.7 REFERENCES:

ASTM A653/A653M - STANDARD SPECIFICATION FOR STEEL SHEET, ZINC-COATED (GALVANIZED) OR ZINC-IRON ALLOY COATED (GALVANNEALED) BY THE HOT-DIP PROCESS.

ASTM B117 - PRACTICE FOR OPERATING SALT-SPRAY (FOG) APPARATUS.

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ASTM D523 - TEST METHOD FOR SPECULAR GLOSS.

ASTM D714 - TEST METHOD FOR EVALUATING DEGREE OF BLISTERING IN PAINT.

ASTM D822 - PRACTICE FOR CONDUCTING TESTS ON PAINT AND RELATED COATINGS AND MATERIALS USING FILTERED OPEN-FLAME CARBON-ARC LIGHT AND WATER EXPOSURE APPARATUS.

ASTM D1654 - TEST METHOD FOR EVALUATION OF PAINTED OR COATED SPECIMENS SUBJECTED TO CORROSIVE ENVIRONMENTS.

ASTM D2244 - TEST METHOD FOR CALCULATION OF COLOR DIFFERENCES FROM INSTRUMENTALLY MEASURED COLOR COORDINATES.

ASTM D2794 - TEST METHOD FOR RESISTANCE OF ORGANIC COATINGS TO THE EFFECTS OF RAPID DEFORMATION (IMPACT).

ASTM D3359 - TEST METHOD FOR MEASURING ADHESION BY TAPE TEST.

ASTM F2408 - ORNAMENTAL FENCES EMPLOYING GALVANIZED STEEL TUBULAR PICKETS.

#### 1.8 SUBMITTALS:

THE MANUFACTURER'S SUBMITTAL PACKAGE SHALL BE REVIEWED AND APPROVED PRIOR TO INSTALLATION. SUBMITTAL PACKAGE SHALL INCLUDE FIELD MEASUREMENTS, SHOP DRAWINGS, SAMPLES AND PRODUCT DATA.

#### 1.9 MOCKUP:

SUBMIT A FULL HEIGHT SECTION (LENGTH TO BE DETERMINED BY MANUFACTURER) THAT INCLUDES ONE POST, HORIZONTAL RAILS, PICKETS, VANDAL MESH, AND ALL HARDWARE.

#### 1.10 PRODUCT HANDLING AND STORAGE:

UPON DELIVERY TO THE JOB SITE, ALL MATERIALS SHALL BE CHECKED TO ENSURE THAT NO DAMAGES OCCURRED DURING SHIPPING OR HANDLING. MATERIALS SHALL BE STORED IN SUCH A MANNER TO ENSURE PROPER VENTILATION AND DRAINAGE, AND TO PROTECT AGAINST DAMAGE, WEATHER, VANDALISM AND THEFT.

#### 1.11 PRODUCT WARRANTY:

A. ALL STRUCTURAL FENCE COMPONENTS (I.E. RAILS, PICKETS, POSTS, BASE PLATES) SHALL BE WARRANTED WITHIN SPECIFIED LIMITATIONS, BY THE MANUFACTURER FOR A PERIOD OF 10 YEARS FROM DATE OF ORIGINAL PURCHASE. WARRANTY SHALL COVER ANY DEFECTS IN MATERIAL FINISH, INCLUDING CRACKING, PEELING, CHIPPING, BLISTERING OR CORROSION

B. REIMBURSEMENT FOR LABOR NECESSARY TO RESTORE OR REPLACE COMPONENTS THAT HAVE BEEN FOUND TO BE DEFECTIVE UNDER THE TERMS OF MANUFACTURES WARRANTY SHALL BE GUARANTEED FOR FIVE (5) YEARS FROM DATE OF ORIGINAL PURCHASE.

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## 2.0 PRODUCTS:

THE FENCE SYSTEM SHALL CONFORM TO DETAILED DRAWINGS. ACCEPTABLE MANUFACTURER'S INCLUDE: AMERISTAR, JERITH OR EQUAL APPROVED PRIOR TO BID.

## 2.1 MATERIALS:

A. MATERIAL FOR FENCE FRAMEWORK (I.E. TUBULAR PICKETS, RAILS AND POSTS), SHALL BE CARBON STEEL GALVANIZED PRIOR TO FORMING IN ACCORDANCE WITH THE REQUIREMENTS OF ASTM A653/A653M, WITH MINIMUM YIELD STRENGTH OF 45,000 PSI (310 MPA). THE STEEL SHALL BE HOT-DIP GALVANIZED TO MEET THE REQUIREMENTS OF ASTM A653/A653M WITH A MINIMUM ZINC COATING WEIGHT OF 0.90 OZ/FT<sup>2</sup> (276 G/M<sup>2</sup>), COATING DESIGNATION G-90.

B. MATERIAL FOR PICKETS SHALL BE 1" SQUARE X 14 GA. TUBING. EACH END OF THE PICKET SHALL BE CLOSED AND SEALED. THE CROSS-SECTIONAL SHAPE OF THE RAILS SHALL CONFORM TO THE MANUFACTURER'S DOUBLE WALL DESIGN WITH OUTSIDE CROSS-SECTION DIMENSIONS OF 1.75" SQUARE AND A MINIMUM THICKNESS OF 14 GA. PICKET HOLES IN THE RAIL SHALL BE SPACED 4.75" O.C. PICKET RETAINING RODS SHALL BE 0.125" DIAMETER GALVANIZED STEEL. HIGH QUALITY PVC GROMMETS SHALL BE SUPPLIED TO SEAL ALL PICKET-TO-RAIL INTERSECTIONS. FENCE POSTS AND GATE POSTS SHALL MEET THE MINIMUM SIZE REQUIREMENTS INDICATED ON THE DRAWINGS.

C. VANDAL MESH: 1-1/2" SQUARE X 10 GAUGE DIAMETER STAINLESS STEEL WOVEN WIRE MESH, POWDERCOATED BLACK.

D. VANDAL MESH ATTACHMENT BRACKET: MANUFACTURER'S STANDARD BRACKET AND HARDWARE, POWDER COATED BLACK.

E. BASE PLATES SHALL BE ASTM A709 GRADE 36 OR 50 STEEL GALVANIZED ACCORDING TO 711.02

F. BASE PLATE ANCHORS: THE THREADED RODS FOR ADHESIVE ANCHORS SHALL BE ASTM A 193, GRADE B7, WITH ASTM A 563 NUTS AND ASTM F 436 WASHERS. MECHANICALLY GALVANIZE ALL ANCHOR HARDWARE ACCORDING TO ASTM B 695, CLASS 65. ALL EXPOSED BASE PLATE HARDWARE SHALL BE PAINTED BLACK TO MATCH FENCE SYSTEM.

G. BASE PLATE ANCHOR ADHESIVE: USE ANCHOR ADHESIVE EVALUATED ACCORDING TO ICCES REPORT AC308, "ACCEPTANCE CRITERIA FOR POST-INSTALLED ADHESIVE ANCHORS IN CONCRETE ELEMENTS", FOR CRACKED AND UNCRACKED CONCRETE APPLICATIONS. PUBLISHED ICCES REPORTS FOR ACCEPTABLE PRODUCTS ARE AVAILABLE AT: [WWW.ICC-ES.ORG/EVALUATION REPORTS/INDEX.SHTML](http://WWW.ICC-ES.ORG/EVALUATION%20REPORTS/INDEX.SHTML) SELECT FROM ONE OF THE FOLLOWING APPROVED PRODUCTS:

1. POWERS PE1000+ EPOXY ADHESIVE ANCHOR SYSTEM (ICCES REPORT ESR-2583).
2. CHEMOFAST C-RE 385 EPOXY ADHESIVE ANCHOR SYSTEM (ICCES REPORT ESR-2538).
3. SIMPSON STRONG-TIE SET-XP EPOXY ADHESIVE ANCHORS (ICCES REPORT ESR-2508).
4. WURTH WIT-PE500 EPOXY ADHESIVE ANCHORS (ICCES REPORT ESR-3051).

THE CONTRACTOR SHALL SUPPLY DOCUMENTATION SEALED BY AN OHIO REGISTERED PROFESSIONAL ENGINEER ENSURING THAT THE SELECTED MECHANICAL ANCHORAGE PROVIDES SUFFICIENT CAPACITY FOR THIS APPLICATION IN ACCORDANCE WITH AC193. INSTALL ANCHORS ACCORDING TO MANUFACTURER'S INSTALLATION INSTRUCTION PUBLISHED IN THE ICCES REPORT.

H. CAULKING COMPOUND: CAULKING COMPOUND SHALL CONFORM TO FEDERAL SPECIFICATION TT-S-00230C TYPE II, CLASS A, COLOR TO MATCH WALL. WHEN APPLYING THE CAULK TO THE BASE PLATE, PROVIDE A 1-INCH OPENING THROUGH THE CAULKING ON LOW SIDE OF BASE PLATE.

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### 3.0 FABRICATION:

A. PICKETS, RAILS AND POSTS SHALL BE PRECUT TO SPECIFIED LENGTHS. RAILS SHALL BE PREPUNCHED TO ACCEPT PICKETS. PICKETS SHALL BE PREDRILLED TO ACCEPT RETAINING RODS.

B. GROMMETS SHALL BE INSERTED INTO THE PREPUNCHED HOLES IN THE RAILS AND PICKETS SHALL BE INSERTED THROUGH THE GROMMETS SO THAT PREDRILLED PICKET HOLES ALIGN WITH THE INTERNAL UPPER RACEWAY OF THE RAILS (NOTE: THIS CAN BEST BE ACCOMPLISHED BY MAKING AN ALIGNMENT JIG). RETAINING RODS SHALL BE INSERTED INTO EACH RAIL SO THAT THEY PASS THROUGH THE PREDRILLED HOLES IN EACH PICKET.

C. THE MANUFACTURED GALVANIZED FRAMEWORK SHALL BE SUBJECTED TO A THERMAL STRATIFICATION COATING PROCESS (HIGH-TEMPERATURE, IN-LINE, MULTI-STAGE, MULTI-LAYER) INCLUDING, AS A MINIMUM, A SIX-STAGE PRETREATMENT/WASH (WITH ZINC PHOSPHATE), AN ELECTROSTATIC SPRAY APPLICATION OF AN EPOXY BASE, AND A SEPARATE ELECTROSTATIC SPRAY APPLICATION OF A POLYESTER FINISH. THE BASE COAT SHALL BE A THERMOSETTING EPOXY POWDER COATING (GRAY IN COLOR) WITH A MINIMUM THICKNESS OF 2 MILS (0.0508MM). THE TOPCOAT SHALL BE A "NO-MAR" TGIC POLYESTER POWDER COAT FINISH WITH A MINIMUM THICKNESS OF 2 MILS (0.0508MM). THE COLOR SHALL BE BLACK. THE STRATIFICATION-COATED FRAMEWORK SHALL BE CAPABLE OF MEETING THE PERFORMANCE REQUIREMENTS FOR EACH QUALITY CHARACTERISTIC SHOWN IN THE TABLE BELOW:

#### COATING PERFORMANCE REQUIREMENTS

<u>QUALITY CHARACTERISTICS</u>	<u>ASTM TEST METHOD</u>	<u>PERFORMANCE REQUIREMENTS</u>
ADHESION	D3359-METHOD B	ADHESION (RETENTION OF COATING) OVER 90% OF TEST AREA (TAPE AND KNIFE TEST).
CORROSION RESISTANCE	B117, D714 & D1654	CORROSION RESISTANCE OVER 3,500 HOURS (SCRIBED PER D1654; FAILURE MODE IS ACCUMULATION OF 1/8" COATING LOSS FROM SCRIBE OR MEDIUM #8 BLISTERS).
IMPACT RESISTANCE IMPACT	D2794	IMPACT RESISTANCE OVER 60 INCH LB. (FORWARD USING 0.625" BALL).
WEATHERING RESISTANCE	D822 D2244, D523 (60°METHOD)	WEATHERING RESISTANCE OVER 1,000 HOURS (FAILURE MODE IS 60% LOSS OF GLOSS OR COLOR VARIANCE OF MORE THAN 3 DELTA-E COLOR UNITS).

D. COMPLETED SECTIONS (I.E., PANELS) SHALL BE CAPABLE OF SUPPORTING A 600 LB. LOAD APPLIED AT MIDSPAN WITHOUT PERMANENT DEFORMATION.

E. SWING GATES SHALL BE FABRICATED USING 1.75" X 14GA DOUBLE CHANNEL RAIL, 2" SQ. X 11GA. GATE ENDS, AND 1" SQ. X 14GA. PICKETS. GATES THAT EXCEED 6" IN WIDTH WILL HAVE A 1.75" SQ. X 14GA. INTERMEDIATE UPRIGHT. ALL RAIL AND UPRIGHT INTERSECTIONS SHALL BE JOINED BY WELDING. ALL PICKET AND RAIL INTERSECTIONS SHALL ALSO BE JOINED BY WELDING.

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### 3.1 PREPARATION:

ALL NEW INSTALLATION SHALL BE LAID OUT BY THE CONTRACTOR IN ACCORDANCE WITH THE CONSTRUCTION PLANS.

### 3.2 FENCE POST INSTALLATION WITH BASE PLATES:

INSTALL ADHESIVE ANCHORS ACCORDING TO THE MANUFACTURER'S INSTALLATION INSTRUCTIONS PUBLISHED IN SECTION 4.3 OF THE ICCES REPORTS LISTED ABOVE. THE MINIMUM EMBEDMENT DEPTH ( $H_{ef}$ ) FOR ANCHORS SHALL BE 7". FENCE POSTS SHALL BE SPACED ACCORDING TO DRAWINGS PLUS OR MINUS 1/2". FENCE POSTS AND PICKETS SHALL BE PLUMB SIDE-TO-SIDE AND BACK-TO-FRONT. FOR INSTALLATIONS THAT MUST BE RAKED TO FOLLOW SLOPING WALLS, THE POST SPACING DIMENSION MUST BE MEASURED ALONG THE MOUNTING SURFACE. FENCE PANELS SHALL BE ATTACHED TO POSTS WITH BRACKETS SUPPLIED BY THE MANUFACTURER.

### 3.3 FENCE INSTALLATION MAINTENANCE:

WHEN CUTTING/DRILLING RAILS OR POSTS ADHERE TO THE FOLLOWING STEPS TO SEAL THE EXPOSED STEEL SURFACES:

- A. REMOVE ALL METAL SHAVINGS FROM CUT AREA.
- B. APPLY ZINC-RICH PRIMER TO THOROUGHLY COVER CUT EDGE AND/OR DRILLED HOLE; LET DRY.
- C. APPLY 2 COATS OF CUSTOM FINISH PAINT MATCHING FENCE COLOR.
- D. FAILURE TO SEAL EXPOSED SURFACES PER STEPS ABOVE WILL NEGATE WARRANTY. MANUFACTURER PROVIDED SPRAY CANS OR PAINT PENS SHALL BE USED TO PRIME AND FINISH EXPOSED SURFACES; IT IS RECOMMENDED THAT PAINT PENS BE USED TO PREVENT OVERSPRAY. USE OF NON-MANUFACTURER PARTS OR COMPONENTS WILL NEGATE THE MANUFACTURES' WARRANTY.

### 3.4 GATE INSTALLATION:

GATE POSTS SHALL BE SPACED ACCORDING TO THE APPROVED SHOP DRAWINGS, DEPENDENT ON STANDARD OUT-TO-OUT GATE LEAF DIMENSIONS AND GATE HARDWARE SELECTED. TYPE AND QUANTITY OF GATE HINGES SHALL BE BASED ON THE APPLICATION; WEIGHT, HEIGHT, AND NUMBER OF GATE CYCLES. THE DRAWINGS SHALL IDENTIFY THE NECESSARY GATE HARDWARE REQUIRED FOR THE APPLICATION. GATE HARDWARE SHALL BE PROVIDED BY THE MANUFACTURE OF THE GATE AND SHALL BE INSTALLED PER MANUFACTURER'S RECOMMENDATIONS.

### 3.5 VANDAL MESH INSTALLATION:

INSTALL VANDAL MESH ON INTERSTATE SIDE OF FENCE. UTILIZE MANUFACTURER'S HARDWARE AND BRACKETS. SPACE BRACKETS ACCORDING TO DETAILS AND APPROVED SHOP DRAWINGS. MESH PANELS SHALL BE 1" LESS THAN THE POST TO POST DIMENSIONS WITH BARBED ENDS ELIMINATED BY TRIMMING. ANY FIELD TOUCH-UP OF EXPOSED ENDS SHALL BE PER MANUFACTURER'S SPECIFICATIONS AND RECOMMENDATIONS.

### 3.6 CLEANING:

THE CONTRACTOR SHALL CLEAN THE JOBSITE OF EXCESS MATERIALS.

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