

SECTION 32 31 19 – Decorative Metal Fences and Gates
Ornamental Steel Picket Fence and Gates
Centurion II

PART 1 GENERAL

1.01 WORK INCLUDED

Work under this item shall consist of furnishing and installing Ornamental Steel Picket Fence and Gates in accordance with the locations, dimensions, lines, grades, and design specified in the contract documents, approved drawings, and this written specification. Please refer to scope of work listed in bidder's instructions.

1.02 RELATED SECTIONS

Section 03 30 00	Cast-in-Place Concrete
Section 11 12 00	Parking Control Equipment
Section 31 20 00	Earthwork
Section 32 05 23	Cement and Concrete for Exterior Improvements
Section 32 19 00	Traffic Signs and Signals
Section 32 30 00	Site Improvements
Section 34 41 16	Traffic Control Equipment
Section	-----

1.03 SYSTEM DESCRIPTION

The manufacturer of the fence system shall include all panels, posts, gates, hardware, fasteners, and required components to provide a complete perimeter fence system. Panels to be fully assembled, coated, and ready to install from the factory as required for the manufacturer's warranty.

1.04 QUALITY ASSURANCE

During assembly and packaging, each component is thoroughly inspected for specification compliance and consistent manufacture. Once on site, Installers must have experience installing these products or similar products.

1.05 STANDARDS AND REFERENCES

ASTM A36 – Carbon Structural Steel

ASTM A500 – Steel Structural Tubing in Rounds and Squares

ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy Coated (Galvannealed) by the Hot-Dip Process

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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 D523 - Test Method for Specular Gloss

ASTM D7803 – Preparation of Zinc (Hot-Dip Galvanized) Coated Iron and Steel Product and Hardware Surfaces for Powder Coating

ASTM F2408 – Ornamental Fences Employing Galvanized Steel Tubular Pickets.

ASTM F2814 - Design and Construction of Ornamental Steel Picket Fence Systems for Security

Purposes

1.06 SUBMITTALS

- A. Shop Drawings
 - a. Standard product drawings of a single unit panel, post, and all hardware with specification including all dimensions, details, and finishes.
 - b. Installation instructions
- B. Samples (if required)
 - a. Minimum representative samples of each component depicting gauge, size, formation, and dimension.

1.07 PRODUCT HANDLING AND STORAGE

- A. Handling
 - a. Product to be handled with care to avoid breakage or damage.
- B. Storage
 - a. Proper storage includes ventilation, drainage, as well as protection from weather, vandalism, theft, corrosive elements (salt, glycol, solvents, etc.) and any other mitigating factors present.
- C. Delivery and Acceptance
 - a. Delivery to be done by typical freight and carrier options. Upon receipt of material, visual inspection to insure no damage or defects.

1.08 WARRANTY

- A. The fence panels including all components (rails, pickets, posts, brackets, fasteners) shall be warranted by the manufacturer for a minimum of 12 years from date of original purchase. Warranty shall cover any defects in structural deformation and material finish, including cracking, peeling, chipping, blistering, or corroding.

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PART 2 PRODUCT DETAILS and MATERIALS

2.01 MANUFACTURER

- A. Basis of Design - Centurion Fence by Stephens Pipe and Steel
- B. Alternate products considered when in full compliance of this written specification and as approved by the architect, engineer, or owner representative.

2.02 MATERIAL COMPONENTS

- A. Components
 - a. All Pickets, Rails, and Post should conform to ASTM A653/653M-17 – Designation G-90 with minimum yield strength of 45,000 psi.
 - b. Picket Size – 3/4” Square with 16 Gauge wall, weighing .605 pounds / foot.
 - c. Rails Size - 1-1/2” Square with 14 Gauge wall, weighing 1.60 pounds / foot.
 - d. Posts Size - 2-1/2” Square with 12 Gauge wall, weighing 3.42 pounds / foot.
 - e. Gate Post Size – 3” Square with 12 Gauge wall, weighing 4.2856 pounds / foot.
 - f. Terminal Post Size – 3” Square with 12 Gauge wall, weighing 4.2856 pounds / foot.
 - g. Optional Posts available – 4” Square with 11 Gauge wall, weighing 7.28 pounds / foot
4” Square with 1/4” wall, weighing 13.99 pounds / foot
6” Square w/ 3/16” wall, weighing 17.25 pounds / foot
 - h. All brackets must be ASTM A653 designation G-90 and size and shape to properly support rail as per manufacturers recommendation. Bracket are affixed to post using a 1/4” x 3/4” x #14 410 Stainless Steel Self Tapping Screw Xylan Coated. Rails are affixed to brackets via a 5/16” 410 Stainless Steel Security Bolt with a Tee-Neck Nut.
- B. Assembly and Fabrication
 - a. Pickets, Rails, and Posts shall be pre sized and all holes cut into rails to pickets in factory prior to coating.
 - b. Grommets inserted into rails to allow passage of picket, as well as providing shim to hold pickets tight in place.
 - c. Retaining rods are inserted through all horizontal rails, though predrilled pickets, securing picket in place and preventing removal or slipping.
 - d. Vertical Load Span 434# (6’ panel) & 326# (8’ panel)
 - e. Horizontal Load Span 682# (6’ panel) & 512# (8’ panel)
- C. Coating applied to each component prior to assembly to ensure complete coverage and shall meet or exceed requirements shown in ASTM 2408 Table 3 –

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<u>Quality Characteristics</u>	<u>ASTM Test Method</u>	<u>Performance Requirements</u>
Adhesion	D3359	Retention of film over 90% of scribed surface.
Corrosion Resistance	B117, D714 & D1654	Minimum 1,000 hours without failure. Failure mode is defined as 1/8 in. (3.2 mm) coating loss from scribe or Medium #8 blisters.
Impact Resistance	D2794	60 in.-lbf impact resistance. Forward impact when using a 0.625 in. (16 mm) diameter ball. Testing to be performed on both 32°F and 73°F substrate (± 4°F).
Weathering Resistance	D822 D2244, D523	1,000 hours gloss retention of 40% and color variance of more than 3 delta-E color units

- D. Product as specified herein exceeds these requirements via a finish coating of electro-static application of thermoset powder with a dry film finish of 2.4 mils.
- E. Finish coating shall be Black, Green, Brown, Dark Bronze, or Custom Color as Specified.
- F. The finished products shall also meet vertical load, horizontal load, and infill performance requirements for Industrial weight fences under ASTM F2408.
- G. All swing gates shall be manufactured by same manufacturer as fence panels and conform with ASTM F900-11 and as detailed in the drawings. Posts sizes and quantities for each gate size are shown on drawings and on gate schedule.
- H. All cantilever slide gates shall be manufactured by same manufacturer as fence panels and conform with ASTM F1184-16 and as detailed in the drawings. Posts sizes and quantities for each gate size are shown on drawings and on gate schedule.

2.03 PERFORMANCE CRITERIA / QUALITY CONTROL

- A. Testing
 - a. All components produced shall be tested to the standards and specifications stated at the point of manufacturer for each item.
- B. Inspection, Repair, and Rejection
 - a. The quality of materials, the process of assembly, and the finished units shall be subject to inspection prior to shipment.
 - b. Any item found deficient in appearance or quality will be rejected. This includes -
 - i. Variations that substantially deviate from the approved model.
 - ii. Dimensions not conforming to standards.
- C. Handling, Storage, and Shipment

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- a. Care shall be taken during storage, transporting, and handling of all units to prevent damage.

PART 3 EXECUTION

3.01 PREPARATION

- A. Site Grading and Preparation
 - a. Site fence line shall be free of obstruction or debris.
 - b. Finish Grade shall be determined prior to setting of posts.
- B. Final installation locations and layout staked and determined by the installing contractor in accordance with the plans and specifications. Manufacturer bears no responsibility for product placement.

3.02 INSTALLATION AND SETUP

- A. Fence post shall be installed as per foundation details as shown on site drawings at minimum. Posts setting by other methods such as plated posts or grouted core-drilled inserts may be required in some areas and must be identified in project submittals.
- B. Product spacing for pickets, tolerances, posts, etc. as shown on drawings or specified herein.
- C. For installations that require racking to follow sloping grades, the post spacing dimension shall be measured along the grade, and product compliance verified before purchase.
- D. Fence panels shall be attached to posts with brackets supplied by the manufacturer.
- E. All gates and gate systems shall be installed as per the manufacturer's installation instructions and be compliant with ASTM F2200 and UL 325 safety requirements.

3.03 FIELD REPAIRS AND QUALITY CONTROL

- A. Any field repairs or alterations of the fence must be done in accordance with manufacturer recommendations and as required to uphold the written warranty.

3.04 CLEANING AND MAINTENANCE

- A. Immediately after installation the fence project site shall be cleaned of excess debris, post excavations removed or spread, and finished installation inspected for deviations.
- B. Maintenance requirements include

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- a. Keeping the fence line free from external debris, vegetation, and external exposures to ensure an extended life span. This includes:
 - i. Removing animal droppings, tree sap, and other environmental factors from fence.
 - ii. Avoiding lawn sprinkler system from direct spray upon the fence.
 - iii. Removing vegetation growing underneath, immediately adjacent to, or upon the fence.

- C. Inspect the fence line semiannually for damage and performance issues. Defective or damaged parts or sections should be immediately replaced.

END OF SECTION