SECTION 055015 – METAL FABRICATIONS FOR STEAM UTILITY DISTRIBUTION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification sections, apply to this section.

1.2 SUMMARY

A. This section includes the furnishing, fabrication and erection of metal fabrications, including he major items listed below:

1. Post installed anchors.
2. Steel ladders.
3. Galvanizing of selected items.
4. Base plates, setting plates and anchor bolts for columns.
5. Columns.
6. Beams.
7. Embedded plates.

1.3 REFERENCES

A. Except as herein specified or as indicated on the Drawings, the work of this section shall comply with the pertinent provisions of the following:

1. ASTM Standard Specifications:

a. A36 - Structural Steel.

b. A123 - Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products.

c. A307 - Carbon Steel Bolts and Studs, 60,000 psi, Tensile Strength.

d. A500 - Cold-Formed Welded and Seamless Carbon Steel Structural Tubing in Rounds and Shapes.

e. A501 - Hot-Formed Welded and Seamless Carbon Steel Structural Tubing.

f. A780 - Standard Practice for Repair of Damaged Hot-Dip Galvanized Coatings.

g. A992 - Steel for Structural Shapes for Use in Building Framing.

h. F436 - Hardened Steel Washers.

2. AISC publications:

a. Specification for the Design, Fabrication and Erection of Structural Steel for Buildings.

b. Detailing for Steel Construction.

c. Manual of Steel Construction.

3. AWS publications: ANSI/AWS D1.1 - Structural Welding Code - Steel.

4. American Hot-Dip Galvanizers Association.

1.4 SUBMITTALS

A. Shop Drawings for all members to be furnished to include:

1. Detail drawings of members and connections:

a. In accordance with AISC - Detailing for Steel Construction.
b. Size and number of bolts.
c. Dimensions.
d. Connection angles and plates.

2. Erection drawings: Locate and identify members.
3. Welding: In accordance with AWS welding symbols.
4. Type of paint.

1.5 QUALITY ASSURANCE

A. Qualifications:

1. Fabrication and erection personnel:

a. Trained and experienced in the type of work being performed.
b. Knowledgeable of the design and the reviewed Shop Drawings.

2. Welders, welding operators and tackers:

a. Qualified by tests in accordance with Section 5 of AWS D1.1.
b. Qualification papers:

1) Given by an independent testing laboratory.
2) Dated no earlier than 6 months prior to beginning of Project.

c. Engineer, at Engineer's discretion, may accept evidence of previous qualifications.

1.6 DELIVERY, STORAGE AND HANDLING

A. Receiving and storage:

1. All materials shall be delivered in original, unbroken, brand marked containers or wrapping as applicable.

2. Handle and store materials:

a. In a manner which will prevent:

1) Deterioration or damage.
2) Contamination with foreign matter.
3) Damage by weather or elements.

b. In accordance with manufacturer's directions.

B. Rejected material and replacements:

1. Reject damaged, deteriorated or distorted material and immediately remove from the site.
2. Replace rejected materials with new material at no additional cost to Owner.

C. Embedded items:

1. Includes anchor rods and other anchorage devices which are to be embedded in cast-in-place concrete or masonry.

2. Delivered on the Project site in time to be installed before the start of cast-in-place concrete or masonry operations.

PART 2 - PRODUCTS

2.1 MATERIALS

A. General: Materials shall be new, top quality of their respective kinds, standard sizes and fabricated in a shop whose principal business is manufacturing the items specified in this section.

B. Yield stress and type of steel:

1. For wide flange shapes: ASTM A992 with yield stress of 50,000 psi.

2. For S shapes, channels, angles, bars, plates and rods: ASTM A36 with yield stress of 36,000 psi.

3. For rectangular and square tubular shapes: ASTM A500 with yield stress of 46,000 psi.

4. For round tubular shapes: ASTM A501 with yield stress of 36,000 psi, or ASTM A53 with yield stress of 35,000 psi.

C. Expansion anchors:

1. HSL heavy duty sleeve anchors by Hilti; or equal.
2. Mechanically galvanized.
3. 4-inch minimum embedment, unless indicated otherwise.

SPECIFIER: Coordinate the following with Division 03 Section "Concrete Accessories for Steam Utility Distribution." Do not specify manhole steps in 2 places.

D. Manhole steps:

1. Provide either cast iron or plastic.

2. Cast iron:

a. Model 8509 by East Jordan Iron Works; Model R-1980-J by Neenah Foundry Company; or equal.

b. Minimum dimensions: 10 inches deep by 14 inches wide, 5-inch tread depth, 1-inch x 1-inch tread section with 2-inch rail height.

3. Plastic:

a. PS2-PF as manufactured by M.A. Industries, Inc. Peachtree City, GA or approved equal.

b. Copolymer polypropylene plastic manhole steps with Grade 60 No. 4 reinforcing bar core.

c. Grip width: 14 inches.

d. Grip depth: 6 inches.

E. Drop-in anchors:

1. HDL drop in anchors by Hilti; or equal.
2. Mechanically galvanized.

F. Adhesive anchors:

1. HIT HY 150 Injection Adhesive Anchor by Hilti; or equal.
2. HAS threaded anchor rod by Hilti; or equal.
3. Use only where indicated on Drawings, or as directed by Engineer.

G. Zinc rich paint: Nitoprime Zincrich by Fosroc, Inc.

2.2 METAL FABRICATIONS

A. Steel ladder:

1. Side rail: 2-1/2-inch x 3/8-inch steel bar in accordance with ASTM A36.
2. Rungs: 3/4-inch diameter, 12 inches apart.
3. Width: 16 inches.
4. Finish: Galvanized.
5. Meet OSHA requirements.
6. Grind exposed edges and welds smooth to the touch.

2.3 FABRICATION

A. General:

1. Workmanship: Install items square and level, accurately fitted and free from distortion and defects.

2. Temporary bracing:

a. Make provision for erection stresses by temporary bracing.
b. Keep work in alignment.

3. Welding:

a. Steel welding shall be performed in accordance with AISC Specification Section J and AWS D1.1.

b. Filler metal requirements for steel welding processes shall be as shown in Table 4.1 of AWS D1.1.

c. Welding shall be continuous along entire area of contact.

B. Galvanizing:

1. Hot-dipped galvanized after fabrication in accordance with ASTM A123.

2. 2 oz/sq ft minimum.

3. Galvanize following items: All steel specified in this section, including anchor bolts, nuts and washers.

4. Retap all nuts after galvanizing to fit thread size and pattern of galvanized anchor bolts.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Workmanship: Install items square and level, accurately fitted and free from distortion and defects.

B. Erection:

1. Bracing:

a. Provide all shoring, bracing and accessories required for complete erection.

b. Safety and adequacy of bracing and temporary bracing are the responsibility of the Contractor.

C. Touch-up: Touch up all field welds, bolt heads, nuts and damaged galvanized areas with a zinc rich paint meeting ASTM D520 and ASTM A780.

D. Welding: Field welding shall be performed to the same standards and requirements of shop welding.

3.2 CLEANING

A. Prior to acceptance of the work of this section, thoroughly clean all installed materials and related areas in accordance Division 01 requirements.

END OF SECTION 055015