DIVISION 05

METAL WORK

SECTION 05200

MISCELLANEOUS METAL WORK

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Miscellaneous metal trim, framing, supports, and appurtenant items.

B. Anchor bolts and other anchorage fastening devices.

C. Grouting under base plates.

1.02 MEASUREMENT AND PAYMENT

A. See Section 02100 - Measurement and Payment.

1.03 REFERENCES

A. AISC M016 - ASD Manual of Steel Construction; American Institute of Steel Construction, Inc..

B. AISC S303 - Code of Standard Practice for Steel Buildings and Bridges; American Institute of Steel Construction, Inc.

C. AISC S329 - Allowable Stress Design Specification for Structural Joints Using ASTM A325 or A490 Bolts; American Institute of Steel Construction, Inc.

D. ASTM A 36/A 36M - Standard Specification for Carbon Structural Steel.

E. ASTM A 53 - Standard Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated, Welded and Seamless.

F. ASTM A 108 - Standard Specification for Steel Bars, Carbon, Cold Finished, Standard Quality.

G. ASTM A 123/A 123M - Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products.

H. ASTM A 153/A 153M - Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware.

I. ASTM A 307 - Standard Specification for Carbon Steel Bolts and Studs, 60 000 PSI Tensile Strength.

J. ASTM A 325 - Standard Specification for Structural Bolts, Steel, Heat Treated, 120/105 ksi Minimum Tensile Strength.

K. ASTM A 325M - Standard Specification for High-Strength Bolts for Structural Steel Joints (Metric).

L. ASTM A 500 - Standard Specification for Cold-Formed Welded and Seamless Carbon Steel Structural Tubing in Rounds and Shapes.

M. ASTM A 501 - Standard Specification for Hot-Formed Welded and Seamless Carbon Steel Structural Tubing.

N. ASTM A 563 - Standard Specification for Carbon and Alloy Steel Nuts.

O. ASTM A 570/A 570M - Standard Specification for Steel, Sheet and Strip, Carbon, Hot-Rolled, Structural Quality.

P. ASTM C 1107 - Standard Specification for Packaged Dry, Hydraulic-Cement Grout (Nonshrink).

Q. ASTM F 436 - Standard Specification for Hardened Steel Washers.

R. AWS A2.4 - Standard Symbols for Welding, Brazing, and Nondestructive Examination; American Welding Society.

S. AWS D1.1 - Structural Welding Code - Steel; American Welding Society.

T. SSPC-Paint 15 - Steel Joist Shop Paint; Society for Protective Coatings; (Part of Steel Structures Painting Manual, Vol. Two).

U. Use the latest issue of the above reference standards as of the date of the project.

1.04 SUBMITTALS

A. See Section 01300 - Administrative Requirements, for submittal procedures.

B. Shop Drawings:

1. Indicate profiles, sizes, spacing, locations of structural members, openings, attachments, and fasteners.

2. Connections not detailed.

3. Indicate cambers and loads.

4. Indicate welded connections with AWS A2.4 welding symbols. Indicate net weld lengths.

C. Manufacturer's Mill Certificate: Certify that products meet or exceed specified requirements.

D. Welders Certificates: Certify welders employed on the Work, verifying AWS qualification within the previous 12 months.

1.05 QUALITY ASSURANCE

A. Take field measurements prior to preparation of shop drawings and fabrication to ensure proper fitting of work.

B. Fabricate miscellaneous steel members in accordance with AISC M016.

C. Comply with Section 10 of AISC S303 for architecturally exposed structural steel.

D. Maintain one copy of each document on site.

E. Fabricator: Company specializing in performing the work of this section with minimum three years of documented experience.

F. Erector: Company specializing in performing the work of this section with minimum three years of documented experience.

G. Design connections not detailed on the drawings under direct supervision of a Professional Structural Engineer experienced in design of this work and licensed in Utah.

1.06 REGULATORY REQUIREMENTS

A. Conform to applicable requirements of the International Building Code.

B. Conform to applicable requirements of the City of Saratoga Springs.

PART 2 PRODUCTS

2.01 MATERIALS

A. Structural Steel Members: ASTM A 36/A 36M.

B. Cold-Formed Structural Tubing: ASTM A 500, Grade A.

C. Hot-Formed Structural Tubing: ASTM A 501, seamless.

D. Steel Bars: ASTM A 108.

E. Steel Plate: ASTM A 514/A 514M.

F. Steel Sheet: ASTM A 570/A 570M hot-rolled, or ASTM A 611 cold-rolled.

G. Pipe: ASTM A 53, Grade B, Finish black.

H. Shear Stud Connectors: ASTM A 108, Grade 1015.

I. Carbon Steel Bolts and Nuts: ASTM A 307, Grade A galvanized to ASTM A 153/A 153M, Class C for galvanized structural members.

J. High-Strength Bolts, Nuts, and Washers: ASTM A 325, Type 1, plain.

K. Anchor Bolts: ASTM A 307, Grade C.

L. High-Strength Anchor Bolts: ASTM A 325, Type 1 plain.

M. Welding Materials: AWS D1.1; type required for materials being welded.

N. Grout: Non-shrink, non-metallic aggregate type, complying with ASTM C 1107 and capable of developing a minimum compressive strength of 7,000 psi at 28 days.

O. Shop and Touch-Up Primer: Fabricator's standard.

P. Touch-Up Primer for Galvanized Surfaces: Fabricator's standard.

2.02 FABRICATION

A. Shop fabricate to greatest extent possible.

B. Continuously seal joined members by continuous welds. Grind exposed welds smooth.

C. Fabricate connections for bolt, nut, and washer connectors.

D. Develop required camber for members.

E. Provide inserts and anchoring devices which must be set in concrete or built into masonry for installation of miscellaneous metal work.

2.03 FINISH

A. Prepare structural component surfaces in accordance with SSPC SP.

B. Galvanize structural steel members to comply with ASTM A 123/A 123M. Provide minimum 1.8 oz/sq ft galvanized coating.

2.04 SOURCE QUALITY CONTROL AND TESTS

A. Provide shop testing and analysis of structural steel.

B. Welded Connections: Visually inspect all shop-welded connections and test welds using one of the following:

1. Radiographic testing per ASTM E 94 and ASTM E 142.

2. Ultrasonic testing per ASTM E 164.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that conditions are appropriate for erection of structural steel and that the work may properly proceed.

3.02 ERECTION

A. Erect miscellaneous steel items in compliance with AISC S303.

B. Allow for erection loads, and provide sufficient temporary bracing to maintain structure in safe condition, plumb, and in true alignment until completion of erection and installation of permanent bracing.

C. Field weld components and shear studs indicated on shop drawings.

D. Use carbon steel bolts only for temporary bracing during construction, unless otherwise specifically permitted on drawings. Install high-strength bolts in accordance with AISC S329.

E. Do not field cut or alter structural members without approval of City Engineer or Inspector.

F. After erection, prime welds, abrasions, and surfaces not shop primed, except surfaces to be in contact with concrete.

G. Grout solidly between column plates and bearing surfaces, complying with manufacturer's instructions for non-shrink grout. Trowel grouted surfaces smooth, splaying neatly to 45 degrees.

3.03 ERECTION TOLERANCES

A. Maximum Variation From Plumb: 1/4 inch.

B. Maximum Offset From True Alignment: 1/4 inch.

END OF SECTION