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BuildingName
The Description of the Project
P00000000 0000

SPECIFICATION DIVISION 5

NUMBER SECTION DESCRIPTION

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DIVISION 05 METALS
SECTION 051200 - STRUCTURAL STEEL FRAMING

USE THIS MASTER FOR SMALL PROJECTS ONLY. SIGNIFICANT STRUCTURAL WORK SHOULD BE SPECIFIED USING AIA MASTERSPEC SECTION OF SAME NAME AND NUMBER.

EDIT THIS SECTION WITH STRUCTURAL DRAWINGS IN HAND.

PART 1 - GENERAL

1.1 SUMMARY

A. Extent of structural steel is shown on drawings.

1.2 SUBMITTALS

A. Shop Drawings: Show complete details for fabrication, assembly and erection.

1.3 QUALITY ASSURANCE

A. Codes and Standards: AISC "Code of Standard Practice for Steel Buildings and Bridges"; AISC "Specifications for the Design, Fabrication, and Erection of Structural Steel for Buildings including "Commentary"; AWS "Structural Welding Code"; comply with applicable provisions except as otherwise indicated.

PART 2 - PRODUCTS

2.1 MATERIALS

THE FOLLOWING LIST OF MATERIALS HAS BEEN EDITED FOR BREVITY. WHERE ADDITIONAL ITEMS ARE REQUIRED, AND FOR ALL BUT THE SIMPLEST STEEL STRUCTURES SUBSTITUTE THE AIA BASIC SECTION.

A. Structural Steel Shapes: ASTM A 572, Grade 50, unless otherwise indicated.

B. Structural Steel Plates and Bars: ASTM A 36, unless otherwise indicated.

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

D. Hot-Formed Structural Steel Tubing: ASTM A 501.

E. Steel Pipe: ASTM A 53, Type E or S, Grade B; Schedule 40 and as follows:

SELECT ONE BELOW.

1. Black finish.
2. Galvanized.

SELECT FASTENERS BELOW IN CONSULTATION WITH STRUCTURAL ENGINEER. HIGH STRENGTH, ASTM A 325, TYPE 1 ARE COMMONLY USED.

F. Nonhigh-Strength Bolts, Nuts, and Washers: ASTM A 307, Grade A (ASTM F 568, Property Class 4.6); carbon-steel, hex-head bolts; carbon-steel nuts; and flat, unhardened steel washers.

SELECT 1 BELOW.

1. Finish: Plain, uncoated.
2. Finish: Hot-dip zinc-coating, ASTM A 153, Class C.
3. Finish: Mechanically deposited zinc-coating, ASTM B 695, Class 50.

G. High-Strength Bolts, Nuts, and Washers: ASTM A 325, Type 1, heavy hex steel structural bolts, heavy hex carbon-steel nuts, and hardened carbon-steel washers.

SELECT 1 BELOW.

1. Finish: Plain, uncoated.
2. Finish: Hot-dip zinc-coating, ASTM A 153, Class C.
3. Finish: Mechanically deposited zinc-coating, ASTM B 695, Class 50.

RETAIN COMPRESSIBLE-WASHER, DIRECT-TENSION INDICATORS BELOW IN CONSULTATION WITH ENGINEER.

4. Direct-Tension Indicators: ASTM F 959, Type 325.
   a. Finish: Plain, uncoated.
   b. Finish: Mechanically deposited zinc-coating, ASTM B 695, Class 50.
   c. Finish: Mechanically deposited zinc-coating, ASTM B 695, Class 50, epoxy coated.

H. High-Strength Bolts, Nuts, and Washers: ASTM A 490, Type 1, heavy hex steel structural bolts, heavy hex carbon-steel nuts, and hardened carbon-steel washers, uncoated.

RETAIN COMPRESSIBLE-WASHER DEVICES BELOW IN CONSULTATION WITH ENGINEER.

1. Direct-Tension Indicators: ASTM F 959, Type 490, uncoated.

DELETE BELOW IF NO WELDING.

I. Welding Electrodes: Comply with AWS requirements.

DELETE BELOW IF NO PRIME PAINTING. UNITS EMBEDDED IN CONCRETE ARE USUALLY NOT PRIMED.

J. Shop Paint: Fast-curing, lead- and chromate-free universal modified -alkyd primer with good resistance to normal atmospheric corrosion, complying with performance requirements of FS TT-P-664.

DELETE BELOW IF NO GALVANIZED STEEL.

K. Galvanizing Repair Paint: High-zinc-dust-content paint for regalvanizing welds in galvanized steel, with dry film containing not less than 93 percent zinc dust by weight, and complying with SSPC Paint 20.

BELOW FOR HEAVY-DUTY APPLICATIONS NOT EXPOSED TO MOISTURE

L. Metallic Shrinkage-Resistant Grout: Premixed factory-packaged ferrous aggregate grout complying with ASTM C 1107, of consistency suitable for application, and with minute working time.

BELOW FOR APPLICATION EXPOSED TO MOISTURE

M. Nonmetallic Shrinkage-Resistant Grout: Premixed, nonmetallic, noncorrosive, nonstaining product containing selected silica sands, portland cement, shrinkage compensating agents, plasticizing and water-reducing agents, complying with ASTM C 1107, of consistency suitable for application, and with a 30-minute working time.

2.2 FABRICATION

A. In general, comply with AISC "Specifications" and final shop drawings. Mark and match-mark units for field assembly.

B. Connections: Use high-strength bolts for field connections.

1. Comply with AWS Code for procedures, appearance, and quality of welds.

C. Fabricate architecturally exposed structural steel with exposed surfaces smooth, square and free of surface blemishes, including pitting, rust, scale seam marks, roller marks, rolled trade names, and roughness.

1. Remove blemishes by filling, grinding, or by welding prior to cleaning, treating, and shop priming.

D. Holes: Provide holes required for securing other work to structural steel framing and for passage of other work through steel framing members, as shown on shop drawings.

1. Cut, drill or punch holes perpendicular to metal surfaces. Do not flame-cut holes or enlarge holes by burning. Drill holes in bearing plates.
2. Weld threaded nuts to framing and other specialty items as indicated to receive other work.

E. Shop Priming: Comply with the following requirements for preparation and application of priming:

1. Preparation for Shop Priming: Prepare uncoated ferrous metal surfaces to comply with minimum requirements indicated below for SSPC surface preparation specifications and environmental exposure conditions of installed metal fabrications:

BOTH OF BELOW APPLY TO LOCATIONS THAT WOULD NORMALLY REMAIN DRY IN SERVICE.

a. Exteriors (SSPC Zone 1B): SSPC-SP 6 "Commercial Blast Cleaning."
b. Interiors (SSPC Zone 1A): SSPC-SP 3 "Power Tool Cleaning."

2. Shop Priming: Shop prime surfaces, except the following:

DELETE INAPPLICABLE ITEMS BELOW.

a. Surfaces embedded in concrete or mortar. Extend priming of partially embedded members to a depth of 2 inches.
b. Surfaces to be field welded.

c. Surfaces to receive sprayed-on fire proofing.
d. Galvanized surfaces.

PART 3 - EXECUTION

3.1 PREPARATION

A. Prior to beginning erection, verify elevations of bearing surfaces and locations of anchorages. Do not proceed until unsatisfactory conditions have been corrected.

B. Provide temporary supports during erection to keep structural steel secure, plumb, and in alignment against temporary construction loads and loads equal in intensity to design loads.

3.2 ERECTION

A. Set structural steel accurately in locations and to elevations indicated and according to AISC specifications referenced in this Section.

ADD LEVELING PLATES TO PARA BELOW IF REQUIRED.

B. Base and Bearing Plates: Clean concrete and masonry bearing surfaces of bond-reducing materials and roughen surfaces prior to setting base and bearing plates. Clean bottom surface of base and bearing plates.

1. Set base and bearing plates for structural members on wedges, shims, or setting nuts as required.
2. Tighten anchor bolts after supported members have been positioned and plumbed. Do not remove wedges or shims but, if protruding, cut off flush with edge of base or bearing plate prior to packing with grout.
3. Pack grout solidly between bearing surfaces and plates so no voids remain. Finish exposed surfaces, protect installed materials, and allow to cure.
   a. Comply with manufacturer's instructions for proprietary grout materials.

C. Maintain erection tolerances of structural steel within AISC's "Code of Standard Practice for Steel Buildings and Bridges."

RETAIN BELOW WHEN ARCHITECTURALLY EXPOSED STRUCTURAL STEEL IS REQUIRED.

1. Maintain erection tolerances of architecturally exposed structural steel within AISC's "Code of Standard Practice for Steel Buildings and Bridges."

D. Align and adjust various members forming part of complete frame or structure before permanently fastening. Before assembly, clean bearing surfaces and other surfaces that will be in permanent contact. Perform necessary adjustments to compensate for discrepancies in elevations and alignment.

1. Level and plumb individual members of structure.

REVIEW SUBPARA BELOW WITH STRUCTURAL ENGINEER AND REVISE AS REQUIRED. DELETE TEMPERATURE ALLOWANCES IF NOT REQUIRED.

2. Establish required leveling and plumbing measurements on mean operating temperature of structure. Make allowances for difference between temperature at time of erection and mean temperature at which structure will be when completed and in service.

E. Splice members only where indicated.

RETAIN PARA BELOW WHEN WELDED, ARCHITECTURALLY EXPOSED STRUCTURAL STEEL IS REQUIRED.

F. Remove erection bolts on welded, architecturally exposed structural steel; fill holes with plug welds; and grind smooth at exposed surfaces.

G. Finish sections thermally cut during erection equal to a sheared appearance.

H. Do not enlarge unfair holes in members by burning or by using drift pins. Ream holes that must be enlarged to admit bolts.

3.3 FIELD CONNECTIONS

EDIT BELOW IN CONSULTATION WITH STRUCTURAL ENGINEER.

A. Install and tighten nonhigh-strength bolts, except where high-strength bolts are indicated.

DELETE ABOVE IF NO NONHIGH-STRENGTH BOLTING.

B. Install and tighten high-strength bolts according to RCSC's "Specification for Structural Joints Using ASTM A 325 or A 490 Bolts."

DELETE ABOVE AND BELOW IF NO HIGH STRENGTH BOLTING. IF H.S. BOLTING IS REQUIRED, SELECT ABOVE, BELOW OR BOTH IN CONSULTATION WITH ENGINEER.

C. Install and tighten high-strength bolts according to RCSC's "Load and Resistance Factor Design Specification for Structural Joints Using ASTM A 325 or A 490 Bolts."

RETAIN SUBPARAS BELOW WITH EITHER H.S. BOLT TYPE ABOVE.

1. Bolts: ASTM A 325 high-strength bolts, unless otherwise indicated.

SELECT ABOVE OR BELOW.

2. Bolts: ASTM A 490 high-strength bolts, unless otherwise indicated.
3. Connection Type: Snug tightened, unless indicated as slip-critical, direct-tension, or tensioned shear/bearing connections.

SELECT ABOVE OR BELOW IN CONSULTATION WITH ENGINEER.

4. Connection Type: Slip-critical, direct-tension, or tensioned shear/bearing connections as indicated.

D. Weld Connections: Comply with AWS D1.1 for procedures, appearance and quality of welds, and methods used in correcting welding work.

1. Comply with AISC specifications referenced in this Section for bearing, adequacy of temporary connections, alignment, and removal of paint on surfaces adjacent to field welds.

DELETE BELOW IF BUILT-UP SECTIONS ARE NOT REQUIRED.

2. Assemble and weld built-up sections by methods that will maintain true alignment of axes without warp.

RETAIN BELOW WHEN ARCHITECTURALLY EXPOSED STRUCTURAL STEEL IS REQUIRED.

3. Verify that weld sizes, fabrication sequence, and equipment used for architecturally exposed structural steel will limit distortions to allowable tolerances. Prevent surface bleeding of back-side welding on exposed steel surfaces. Grind smooth exposed fillet welds 1/2 inch and larger. Grind flush butt welds. Dress exposed welds.

3.4 CLEANING

A. Touchup Painting: Clean and touchup paint of field welds, bolted connections, and abraded areas of shop paint on structural steel.

END OF SECTION 051200