SECTION 051200

STRUCTURAL STEEL FRAMING

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**NOTE TO SPECIFIER**

*Use this Specification Section for Mail Processing Facilities.*

***This is a Type 1 Specification with completely editable text; therefore, any portion of the text can be modified by the A/E preparing the Solicitation Package to suit the project.***

*For Design/Build projects, do not delete the Notes to Specifier in this Section so that they may be available to Design/Build entity when preparing the Construction Documents.*

*For the Design/Build entity, this specification is intended as a guide for the Architect/Engineer preparing the Construction Documents.*

*The MPF specifications may also be used for Design/Bid/Build projects. In either case, it is the responsibility of the design professional to edit the Specifications Sections as appropriate for the project.*

*Text shown in brackets must be modified as needed for project specific requirements.* *See the “Using the USPS Guide Specifications” document in Folder C for more information.*

*The last date that USPS revised this standard specification section occurs in two places, at the end of this section and in the Table of Contents. If the date in this section matches the date in the Table of Contents, then you are using the latest version. Do not delete or revise the “last revised” date at the end of the section during the development of the Project Manual.*

*The footer in this section should be edited to replace the text, “USPS MPF SPECIFICATION” with the project name, and the blank date in the center should be replaced with the submission date, for interim design reviews, or the issue date of the completed Project Manual.*

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1. GENERAL
   1. SUMMARY
      1. Section Includes:
         1. Structural steel framing members, support members, with required bracing, welds, and fasteners.
         2. Base plates.
         3. Grouting under base plates.
      2. Related Sections:
         1. Section 033000 – Cast-In Place Concrete: Anchorages cast in concrete. Grouting base plates and bearing plates.
         2. Section 052100 - Steel Joist Framing: Steel bracing for joists and joist girders.
         3. Section 053100 - Steel Decking: Support framing for small openings in deck.
         4. Section 055000 - Metal Fabrications: Steel fabrications affecting structural steel work.
   2. REFERENCES
      1. American Institute of Steel Construction (AISC):
         1. Specification for the Design, Fabrication and Erection of Structural Steel for Buildings.
         2. AISC - Code of Standard Practice - Manual of Steel Construction - Thirteenth Edition or latest enforceable AISC Manual.
         3. AISC - Section 10 - Architecturally Exposed Structural Steel.
      2. American Society for Testing and Materials (ASTM):
         1. ASTM A36/A36M - Specification for Structural Steel.
         2. ASTM A53 - Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated, Welded and Seamless.
         3. ASTM A108 - Specification for Steel Bars, Carbon, Cold-Finished, Standard Quality.
         4. ASTM A123 - Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products.
         5. ASTM A153 - Specification for Zinc Coating (Hot Dip) on Iron and Steel Hardware.
         6. ASTM A242/A242M - Specification for High-Strength Low-Alloy Structural Steel.
         7. ASTM A 307 - Specification for Carbon Steel Bolts and Studs, 60,000 psi Tensile Strength.
         8. ASTM A 325 - Specification for Structural Bolts, Heat Treated, 120/105 ksi Minimum Tensile Strength.
         9. ASTM A449 - Specification for Quenched and Tempered Steel Bolts and Studs.
         10. ASTM A490 - Specification for Heat-Treated Steel Structural 150 ksi Minimum Tensile Strength.
         11. ASTM A 500 - Specification for Cold‑Formed Welded and Seamless Carbon Steel Structural Tubing in Rounds and Shapes.
         12. ASTM A 501 - Specification for Hot‑Formed Welded and Seamless Carbon Steel Structural Tubing.
         13. ASTM A514/A514M - Specification for High-Yield Strength, Quenched and Tempered Alloy Steel Plate, Suitable for Welding.
         14. ASTM A529/A529M - Specification for High-Strength Carbon-Manganese Steel of Structural Quality.
         15. ASTM A563 - Specification for Carbon and Alloy Steel Nuts.
         16. ASTM A568/A568M - Specification for Steel, Sheet, Carbon and High-Strength, Low-Alloy, Hot-Rolled and Cold-Rolled, General Requirements for.
         17. ASTM A572/A572M - Specification for High-Strength Low-Alloy Columbium-Vanadium Structural Steel.
      3. American Welding Society (AWS):
         1. AWS D1.1 - Structural Welding Code.
         2. AWS A2.4 - Symbols for Welding, Brazing, and Nondestructive Examination.
      4. Factory Mutual (FM):
         1. FM - Roof Assembly Classifications.
      5. Underwriters Laboratories, Inc. (UL):
         1. UL - Fire Resistance Directory.
      6. Steel Structures Painting Council (SSPC):
         1. SSPC - Painting Manual.
         2. SSPC-Paint 20 Type II - Zinc Rich Primers - Organic.
         3. SSPC-Paint 22 - Epoxy Polyamide Paints.
         4. SSPC-Paint 25 - Red Iron Oxide, Zinc Oxide, Raw Linseed Oil, and Alkyd Primer.
         5. SSPC-SP 2 - Hand Tool Cleaning.
         6. SSPC-SP 6 - Commercial Blast Cleaning.
   3. SUBMITTALS
      1. Section 013300 - Submittal Procedures: Procedures for submittals.
         1. Shop Drawings:
            1. Indicate profiles, sizes, spacing, locations of structural members, openings, attachments, and fasteners.
            2. Connections.
            3. Cambers and loads.
            4. Indicate welded connections with AWS A2.0 welding symbols. Indicate net weld lengths.
         2. Assurance/Control Submittals:
            1. Erection Procedure: Submit descriptive data to illustrate structural erection procedure including sequence of erection and temporary staying and bracing.
            2. Field Welding Equipment: Submit descriptive data for field welding equipment including type, voltage, and amperage.
            3. Test Reports: Submit the following reports directly to Contracting Officer from Testing Laboratory, with copy to Contractor. Prepare reports in conformance with Section 014000 - Quality Requirements:

Welding inspection.

Bolted connection inspection.

* + - * 1. Certificates: Certify welders employed on Work, verifying AWS qualification within previous 12 months.
        2. Qualification Documentation: Submit documentation of fabricator and erector experience indicating compliance with specified qualification requirements.
  1. QUALITY ASSURANCE
     1. Qualifications:
        1. Fabricator: Company specializing in performing the work of this section with minimum 5 years documented experience.
        2. Erector:
           1. A company specialized in performing the work of this section with a minimum of 5 years documented experience.
           2. A qualified company that participates in the AISC Quality Certification Program and is designated an AISC-Certified Erector, Category CASE or CSE.
        3. Qualifications for Welding Work: Qualify welding operators in accordance with AWS Standard Qualification Procedures. Provide certification that welders employed in work have satisfactorily passed AWS qualification tests within previous 12 months. If rectification of welders is required, provide without additional cost to Owner.
     2. Fabricate structural steel members in accordance with AISC Code of Standard Practice.
     3. Perform Work in accordance with AISC Section 10.
     4. Design connections not detailed on the Drawings under direct supervision of a Professional Structural Engineer experienced in design of this work and licensed in State where Project is located.
     5. Survey: Employ a Registered Professional Surveyor registered in State in which Project is located, experienced in survey work, to establish permanent bench marks as shown and as necessary for accurate erection of structural steel. Check elevations of concrete and masonry bearing surfaces, and locations of anchor bolts and similar devices, before erection work proceeds, and report discrepancies to Owner. Do not proceed with erection until corrections have been made, or until compensating adjustments to structural steel work have been agreed upon with Owner.
  2. DELIVERY, STORAGE, AND HANDLING
     1. Section 016000 - Product Requirements: Transport, handle, store, and protect Products.
     2. Store steel above ground on platforms, skids, or other supports.
     3. Protect steel from corrosion.
     4. Store packaged materials in their original, unbroken packages or containers.

1. PRODUCTS
   1. MATERIALS
      1. Structural Steel Shapes, Plates and Bars: ASTM A 36.
      2. Structural Tubing: ASTM A 500, Grade B.
      3. Bolts, Nuts, and Washers: AISC Specification Section 1.4.4.
         1. Unfinished Bolts: ASTM A 307.
         2. High Strength Bolts: ASTM A 325 or A 490.
         3. Anchor Bolts and Nuts: ASTM A 307 Grade A.
         4. High Strength Anchor Bolts: ASTM A 490.
      4. Welding Materials: AWS D1.1; type required for materials being welded or as indicated on Drawings.
      5. Rivets: AISC Specification Section 1.4.3.
         1. Steel Structural Rivets: ASTM A 502.
      6. Grout: Specified in Section 033000.
      7. Shop and Touch-Up Primer: AISC Specification Section 1-24.
   2. FABRICATION
      1. Fabricate structural steel members in accordance with AISC Code Section 6 and AISC Specification.
      2. Connections not detailed on Drawings: Engineer by fabricator, which is subject to review.
      3. Fabricator's Responsibility:
         1. Errors of detailing, fabrications, and for correct fitting of structural steel members.
         2. Do not splice structural steel members. Members having splice not indicated on Drawings will be rejected.
      4. Continuously seal joined members by continuous welds. Grind exposed welds smooth.
      5. Fabricate connections for bolt, nut, and washer connectors.
      6. Develop required camber for members.
   3. FINISH
      1. Clean, prepare, and shop prime structural steel members in accordance with SSPC - Painting Manual. Do not paint surfaces in contact with concrete, or surfaces specified to be galvanized.
      2. Shop prime structural steel members. Do not prime surfaces that will be field welded, in contact with concrete, and high strength bolted.
   4. SOURCE QUALITY CONTROL AND TESTS

A. Provide shop testing of structural steel sections.

1. EXECUTION
   1. EXAMINATION
      1. Section 017300 - Execution: Verification of existing conditions before starting work.
      2. Verification of Conditions: Verify that field measurements, surfaces, substrates and conditions are as required, and ready to receive Work.
      3. Report in writing to Contracting Officer prevailing conditions that will adversely affect satisfactory execution of the Work of this Section. Do not proceed with Work until unsatisfactory conditions have been corrected.
      4. By beginning Work, Contractor accepts conditions and assumes responsibility for correcting unsuitable conditions encountered at no additional cost to the United States Postal Service.
   2. PREPARATION
      1. Supply items required to be cast into concrete or embedded in masonry with setting diagrams to appropriate Sections.
   3. ERECTION
      1. Erect structural steel in accordance with AISC Code, Section 7, and AISC Specification Section 1.25 except as specified herein.
      2. Make provision for erection loads, and for sufficient temporary bracing to maintain structure safe, plumb, and in true alignment until completion of erection and installation of permanent bracing.
      3. Do not field cut or alter structural members without approval of the Engineer.
      4. Field weld components indicated on Drawings.
      5. Field connect members with threaded fasteners; torque to required resistance.
      6. After erection, prime welds, abrasions, and surfaces not shop painted that are to receive finish painting, except surfaces to be in contact with concrete. Use a primer consistent with shop coat.
      7. Anchor Bolts: Install anchor bolts and other connectors required for securing structural steel to foundations and other in‑place work. Furnish templates and other devices as necessary for presetting bolts and other anchors to accurate locations.
      8. Setting Bases and Bearing Plates: Clean concrete and masonry bearing surfaces of bond‑reducing materials and roughen to improve bond to surfaces. Clean bottom surfaces of base and bearing plates.
         1. Set loose and attached base plates and bearing plates for structural members on steel wedges or other adjusting devices.
         2. Tighten anchor bolts after the 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 grouting.
         3. Grout solidly between bearing surfaces and bases of plates immediately after erecting member and before additional load is placed on member. Finish exposed surfaces, protect installed materials, and allow to cure. For proprietary grout materials, comply with manufacturer's installation instructions.
         4. Slide bearings: Permanently affixed to member and support, respectively, by welding or bolting as indicated. Align and level member faces to maintain full contact between surfaces before completing installation.
      9. High‑strength Bolting: Comply with specifications for Structural Joints using ASTM A 325 or A 490 Bolts.
      10. Erection Bolts:
          1. Comply with ASTM A 307.
          2. On exposed welded construction, remove erection bolts, fill holes with plug welds, and grind smooth at exposed surfaces.
      11. Touch‑up Painting: Immediately after erection, clean exposed field welds, bolted connections, and abraded areas of shop paint. Apply paint to exposed areas with same material as used for shop painting. Apply by brush or spray to provide a minimum dry film thickness of 2.0 mils.
   4. CONSTRUCTION
      1. Site Tolerances:
         1. Maximum Variation From Plumb: 1/4 inch.
         2. Maximum Offset From True Alignment: 1/4 inch.
   5. FIELD QUALITY CONTROL
      1. Section 014000 - Quality Requirements: Field testing and inspection.
      2. Quality Assurance Program:
         1. AISC Code Section 8 and AISC Specification Section 1.26.
         2. AISC Quality Criteria and Inspection Standards, except as specified herein.
      3. Welding:
         1. AWS D1.1 Section 6.
         2. Inspectors: AWS Certified in accordance with AWS QCI, Standard for Qualifications and Certification of Welding Inspectors.

END OF SECTION

USPS MPF Specification Last Revised: 10/1/2022