READ THIS FIRST

This Project Spec Document may need additional modifications to suit your project. It is recommended that you proofread each section, paying attention to any “Notes” boxes such as this one--you should remove these “Notes” sections as you go. Also, do a search for all bracket characters “ [ ] “ as they are used to show you areas containing options or project specific details (you can use Microsoft Word’s Find feature {Ctrl-F} to jump to an open bracket “ [ “ character quickly). Again, these bracket characters should be removed.

It is important that every paragraph be numbered to allow for easy referencing. If you use the document’s built in styles and formatting your outline should be fine (turn on the formatting toolbar by going to View > Toolbars > Formatting). Most paragraphs will use the style “Numbered Material” and can be promoted (Shift) or demoted (Shift-Tab).

You should not have to manually enter extra spaces, carriage returns or outline characters such as A, B, C, or 1.01, 1.02; the formatting will do this for you. The entire document is 11 pt. Arial. If you paste items in, you may need to reapply the “Numbered Material” format.

1. GENERAL
   1. SUMMARY OF WORK
      1. The extent and location of the “Structural Steel” Work is indicated in the Contract Documents.
      2. Terms
         1. The terms, “steel,” “structural steel,” “channel,” “angles,” “pipe,” “tube,” “plate,” and other similar variations of these terms used in the context of this section generally refer to structural steel materials and shapes.
   2. GOVERNING CODES, STANDARDS, AND REFERENCES
      1. American Institute of Steel Construction (AISC)
         1. AISC 303, Code of Standard Practice for Steel Buildings and Bridges
         2. AISC 325, Steel Construction Manual
         3. AISC 326, Detailing for Steel Construction
         4. AISC 341, Seismic Provisions for Structural Steel Buildings
         5. AISC 360, Specification for Structural Steel Buildings
         6. AISC DG1-26, Design Guides (as applicable)
      2. American Society for Testing and Materials (ASTM)
         1. A6, Standard Specification for General Requirements for Rolled Structural Steel Bars, Plates, Shapes, and Sheet Piling
         2. A36, Specification for Carbon Structural Steel
         3. A53, Standard Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated, Welded and Seamless
         4. A108, Standard Specification for Steel Bar, Carbon and Alloy, Cold-Finished
         5. A193, Standard Specification for Alloy-Steel and Stainless Steel Bolting Materials for High-Temperature Service and Other Special Purpose Applications
         6. A240, Standard Specification for Chromium and Chromium-Nickel Stainless Steel Plate, Sheet, and Strip for Pressure Vessels and for General Applications.
         7. A242, Standard Specification for High-Strength Low-Alloy Structural Steel
         8. A276, Standard Specification for Stainless Steel Bars and Shapes
         9. A307, Standard Specification for Carbon Steel Bolts and Studs, 60,000 psi Tensile Strength
         10. A449, Standard Specification for Quenched and Tempered Steel Bolts and Studs
         11. A489, Specification for Carbon Steel Lifting Eyes.
         12. A493, Standard Specification for Stainless Steel Wire and Wire Rods for Cold Heading and Cold Forging
         13. A500, Standard Specification for Cold-Formed Welded and Seamless Carbon Steel Structural tubing in Rounds and Shapes
         14. A501, Standard Specification for Hot-Formed Welded and Seamless Carbon Steel Structural Tubing
         15. A514, Standard Specification for High Yield Strength, Quenched and Tempered Alloy Steel Plate, Suitable for Welding
         16. A529, Standard Specification for High-Strength Carbon-Manganese Steel of Structural Quality
         17. A563, Standard Specification for Carbon and Alloy Steel Nuts
         18. A572, Standard Specification for High-Strength Low Alloy Columbium-Vanadium Structural Steel
         19. A588, Standard Specification for High-Strength Low-Alloy Structural Steel with 50ksi Minimum Yield Point, with Atmospheric Corrosion Resistance
         20. A618, Standard Specification for Hot-Formed Welded and Seamless High-Strength Low-Alloy Structural Tubing
         21. A666, Standard Specification for Annealed or Cold-Worked Austenitic Stainless Steel Sheet, Strip, Plate, and Flat Bar.
         22. A668, Standard Specification for Steel Forgings, Carbon and Alloy, for General Industrial Use
         23. A709, Standard Specification for Structural Steel for Bridges
         24. A780, Standard Practice for Repair of Damaged and Uncoated Areas of Hot-Dip Galvanized Coatings
         25. A786, Standard Specifications for Hot-Rolled Carbon, Low-Alloy, High-Strength Low-Alloy, and Alloy Steel Floor Plates.
         26. A992, Standard Specification for Structural Steel Shapes
         27. D4894, Standard Specification for Polytetrafluoroethylene (PTFE) Granular Molding and Ram Extrusion Materials
         28. D4895, Standard Specification for Polytetrafluoroethylene (PTFE) Resin Produced From Dispersion
         29. F436, Specification for Hardened Steel Washers.
         30. F593, Standard Specification for stainless Steel Bolts, Hex Cap Screws, and Studs
         31. F594, Standard Specification for Stainless Steel Nuts
         32. F844, Specification for Washers, Steel, Plain (Flat), Unhardened for General Use.
         33. F959, Compressible-Washer-Type Direct Tension Indicators for Use with Structural Fasteners
         34. F1554, Standard Specification for Anchor Bolts, Steel, 36, 55, and 105-ksi Yield Strength
         35. F3125, Standard Specification for High Strength Structural Bolts, Steel and Allow Ateel, Heat Treated, 120 ksi and 150 ksi Minimum Tensile Strength
      3. American Society for Mechanical Engineers (ASME ) International
         1. ASME B46.1, Surface Texture, Surface Roughness, Waviness, and Lay
         2. ANSI/AWS A2.4, Standard Symbols for Welding, Brazing, and Nondestructive Testing, Structural Welding Code
         3. ANSI/AWS D1.1, Structural Welding Code - Steel
         4. ANSI/AWS D1.6, Structural Welding Code – Stainless Steel
      4. International Building Code (IBC)
         1. International Building Code as adopted by the [City of Seattle as the Seattle Building Code] [Seattle-Tacoma International Airport Building Department] [Authority Having Jurisdiction] [other].
      5. Research Council on Structural Connections (RCSC)
         1. Specification for Structural Joints Using High-Strength Bolts.
         2. Educational Bulletin No. 4, Recommended Erection and Field Inspection Procedures for High-Strength Bolts in Structural Steel Assemblies.
      6. Society for Protective Coatings (SSPC)
         1. SSPC -A 1, Shop, Field, and Maintenance Painting of Steel
         2. SSPC PS-13.01, Epoxy Polyamide Painting System
         3. SSPC Paint 25, Zinc Oxide, Alkyd, Linseed, Oil Primer for Use Over Cleaned Steel, Type I and Type II.
         4. SSPC SP-2, Hand Tool Cleaning
         5. SSPC SP-3, Power Tool Cleaning
         6. SSPC SP-6, Commercial Blast Cleaning
         7. SSPC SP-10, Near-White Blast Cleaning
   3. SUBMITTALS
      1. Submit materials data in accordance with Section 01 33 00 - Submittals. Furnish manufacturers’ technical literature, standard details, product specifications, and installation instructions for all products.
      2. Submittals shall include the following:
         1. Manufacturer Contact Information
            1. Provide manufacturer contact information for each material provider.
            2. Provide fabricator contact information for each fabricator.
         2. Shop Drawings
            1. Detailed shop drawings shall be submitted for all elements and assemblies.

This includes but is not exclusive to steel, lumber, timber, plastic, rubber, composite materials, and all related hardware detailed as units and as assemblies.

* + - * 1. Elements in shop drawings shall be shown with respect to grid, bent locations, or other identifying location shown on contract documents.
        2. Shop drawings shall be approved by the Engineer prior to the fabrication of custom construction materials or material assemblies.
        3. Show all shop and erection details including cuts, copes, splices, weld preparations, temporary attachments, permanent attachments, cambers, sweeps, lifting holes, fasteners, welds, and other similar conditions.
        4. Show all welds, both shop and field, using AWS notation.
        5. If vendor or other supplied products are used as a portion of an assembly, attach manufacturer material specifications, ‘cut-sheets,’ and other manufacturer information.
      1. Erection Plans and other information buried below should be listed here and removed from Parts 2 and 3
      2. Shop Primer
         1. Product identification
         2. Product and product application specifications
         3. Test reports for Class B coatings for slip-critical connections
      3. Laboratory Tests
         1. Laboratory test results showing physical and chemical properties] [Submit mill certificates] in accordance with Section 01 33 00 - Submittals of these specifications.
      4. Qualification Proofs
         1. Evidence satisfactory to the Engineer that the steel Contractors for fabrication and steel erection are qualified for the Work in accordance with the requirements of this section of the specifications. Submit in accordance with Section 01 33 00 - Submittals of these specifications.
      5. Structural Steel Component Identification
         1. Steel member identification key plan using design drawings where possible.
      6. Fabrication and Erection Drawings
         1. Fabrication Plan
         2. Erection Plan

1. MATERIALS

A. If only one product is acceptable (single or sole source product), obtain an approved Competition Waiver and submit to the CPO Construction, Contract Administrator. The language shall read as: “Manufacturer Name, Product # XXXXX, No Equal.” Refer to CPO-6 Competition Waiver Policy for more information.

B. If a Competition Waiver is not approved or more than one product is acceptable, this section must list a minimum of 2 products plus the language “Or Approved Equal,” along with salient characteristics. Refer to CPO Construction’s Salient Characteristics Guidelines for more information.

* 1. PROJECT INFORMATION
  2. PREPARATION FOR MATERIALS
     1. Manufacturer Contact Information
  3. FABRICATION, PRODUCTION, AND SUPPLY OF MATERIALS
     1. General Fabrication Criteria
        1. All structural steel shall be fabricated in strict accordance with the plans, approved shop drawings, and the reference standards.
        2. All material stored at the plant, prior to or after fabrication, shall be protected from rust or an accumulation of dirt, oil, or other foreign matter. Material which shows signs of pitting due to rust will not be accepted.
        3. The workmanship and finish shall be first-class and equal to the best practice. Welding, shearing, burning and chipping shall be neatly and accurately done, and all portions of the Work exposed to view shall be neatly finished.
        4. Drill or punch all holes required for the attachment of Work of other trades and for bolted connections. Burned holes are not acceptable.
     2. Fabrication
        1. Fabrication shall be in accordance with the applicable provisions of AISC 325.
        2. Fabrication and assembly shall be completed in the shop to the greatest extent possible.
        3. Fabricating plant shall be certified under AISC 201.
     3. Bolt and Rivet Holes
        1. Bolt and rivet holes required for fabrication of all steel structures shall conform to the applicable requirements designated within or referenced by the AISC references listed above.
        2. High-strength bolted connections shall be fabricated according to the recommendations of the RCSC.
     4. Welding
        1. Welding fabrications shall comply with Section 05 05 23 – Welding.
  4. MATERIAL REQUIREMENTS
     1. All Materials
        1. Unless noted or specified otherwise, all products shall be new, free from defects, and of the best quality for the intended use.
        2. Once in finished form, materials shall remain within specification tolerances throughout the duration of the project, including at the time of installation.
        3. When proprietary systems are required, Contractor shall generally conform to manufacturers' specifications as a minimum for best performance in the use of each of their products.
           1. If manufacturer instructions are at variance with these specifications, report the discrepancy to the Port of Seattle before proceeding.
        4. Products and materials designated for use may be custom; prices and availability may vary significantly by product.
     2. Corrosion Protection
        1. Where allowable by ASTM, the minimum copper content shall be 0.2% for structural shapes.
     3. Structural Steel Shapes
        1. Structural steel shapes shall comply with values and standards shown in the following table:

|  |  |  |
| --- | --- | --- |
| SHAPE | GRADE (KSI) YIELD (TENSILE) | STANDARD (ASTM UNLESS OTHERWISE DESIGNATED) |
| Plate | 36 (58) | A36 |
| Plate (dynamically loaded structures) | 50 (65) | A572 |
| W | 50 (65) | A992 |
| M, S, MC, L | 36 (58) | A36 |
| HP | 50 (65) | A572 Gr. B |
| HP Piling | 50 (65) | A690 |
| C | 50 (65) | A572 |
| Pipe Piling | 45 (66) | A252 Gr. 3 |
| Pipe | 35 (60) | A53 Gr. B |
| HSS Round | 46 (62) | A500 Gr. C |
| HSS Rect. | 50 (62) | A500 Gr. C |
| Steel Sheet Piling | 50 (65) | A690 |

* + - 1. Steel Sheet Piling
         1. For identification purposes, Bethlehem Steel Company's designations are used on the drawings, but the equivalent section of other manufacturers will be acceptable.
         2. All steel sheet piling shall:

Individual piles shall be of length shown, within an allowable tolerance of plus or minus 2’-6”

Shall be in one (1) piece.

* + 1. Structural Steel Fasteners
       1. Structural steel fasteners shall comply with values and standards shown in the following table:

|  |  |  |
| --- | --- | --- |
| SHAPE (DIAMETER) | GRADE (KSI) YIELD (TENSILE) | STANDARD (ASTM UNLESS OTHERWISE DESIGNATED) |
| Conventional Structural Bolts (0.5” to 1.5” incl.) | (120) | F3125 Gr. A325 |
| Twist-off Tension Control Bolts (0.5” to 1” incl.) | (120) | F3125 Gr. F1852 |
| Common Bolts (.25” to 4”) | (60) | A307 Gr. A |
| Nuts (0.25” to 4”) | N/A | A563 |
| Washers (0.25” to 4”) | N/A | F436 |
| Direct Tension-Indicator Washers (0.5” to 1.5”) | N/A | F959 |
| Threaded Rods (to 10”) | 36 (58) | A36 |
| Shear Studs (0.375” to 0.75”) | (65) | A108 |
| Anchor Rods | 36 (58) | F1554 Gr. 36 |

* + 1. Shop Primer
       1. Unless otherwise designated, a shop-applied primer shall be applied to building structural steel for temporary protection to the steel during delivery, storage on site, and installation in a generally noncorrosive environment.
       2. SSPC Paint 25 (alkyd primer) or SSPC PS 13.01 epoxy-polyamide, green primer (Form 150) type 1 shall be applied to structural steel in accordance with SSPC-Paint 15. Test panel testing is not required.
    2. Shop Cleaning and Priming
       1. Shop-paint all structural steel with one coat where priming is required, in accordance with Section 09 90 00 - Paints and Coatings.
       2. After fabrication has been completed and before the shop coat of primer is applied, thoroughly clean all structural steel, except machine finishes in accordance with Section 09 90 00 - Paints and Coatings.
       3. Paint all structural steel, after it is thoroughly cleaned as specified above, with one shop coat within 17 hours of cleaning, or sooner if required by paint manufacturer.
       4. Clean all steel to be encased in concrete.
    3. Consumables for Welding
       1. Weld materials shall be selected that suitable for strength, ductility, material compatibility, and toughness to the approval of the Engineer.
       2. Weld materials shall conform with the applicable specifications designated or referenced within AWS D1.1
    4. Surface Preparation
       1. Fabricator Cleaning
          1. Dirt, oil, grease and loose mill scale shall be removed in accordance with SSPC-SP1 – Solvent Cleaning.
       2. Minimum Surface Preparation
          1. Unless otherwise stated, all steel surfaces shall be prepared in conformance with SSPC-SP2 (Hand Tool Cleaning) at the location of fabrication prior to shipping.

Where shop primer, coating, galvanizing, fireproofing, or other coating or surface preparation is designated that supersedes this this requirement, the more stringent preparation applies.

* + - * 1. Shop cleaning shall be scheduled with the inspector.
  1. MATERIAL HANDLING, DELIVERY, AND STORAGE
     1. Materials shall be stored out of contract with the ground in such manner and location as will minimize deterioration.
     2. Structural steel surfaces shall be protected during handling, delivery, and storage.
        1. Contractor shall provide the equipment, materials, and personnel required for minor surface repairs at the point of delivery.
  2. QUALITY ASSURANCE
     1. Inspection and Testing
        1. The Port of Seattle will provide field or plant inspection and testing service to the satisfaction of the Engineer.

Use “Independent Inspection and Testing” section above when the project does not utilize CQC. Coordinate closely with Section 01 45 29 – Quality Control; Testing Laboratory Services to assure Sampling and Testing on materials called for in that section agree with intent of this section.

OR

Use “Contractor Quality Control Testing and Inspection” section above when project utilizes CQC and Section 01 45 16.13 – Contractor’s Quality Control Program. Provide text for inspection and testing to be performed with specifics on frequency and scope.

* + - 1. Sampling and testing to assure compliance with the contract provisions shall be in accordance with [Section 01 45 29 - Quality Control, Testing Laboratory Services] [Section 01 45 16.13 – Contractor’s Quality Control Program] of these specifications.
      2. The Contractor may obtain copies of results of tests performed by the Port of Seattle from the office of the Engineer at no cost.
      3. Tests conducted for the sole benefit of the Contractor shall be at the Contractor's expense.
    1. Qualification of Manufacturer:
       1. The steel fabricator shall have not less than 5 years of continuous experience in the fabrication of structural steel.
       2. The steel erector shall have not less than 5 years of continuous experience in the erection of structural steel.
       3. All welding shall be performed by welders who are currently certified by the Washington Association of Building Officials and shall conform to the current specifications of the AWS.

1. EXECUTION
   1. PROJECT INFORMATION
   2. PREPARATION FOR EXECUTION OF WORK
      1. Structural Steel Component Identification
         1. Prior to erection or assembly, steel members shall be identified with removable marking materials on the outermost coating layer.
         2. Steel member identification notation shall align with notation shown in shop drawings, reports, and other Contractor-generated materials where possible.
         3. All beams, columns, and other significant structural shapes shall be identified.
      2. Fabrication and Erection Drawings
         1. Fabrication drawings shall be prepared in accordance with AISC 325 and 326.
         2. The erection plan for low-rise buildings and building components shall conform to AISC 303.
         3. Fabrication drawings shall include complete information for the fabrication and erection of the structure’s components, including the location, type, and size of bolts, welds, member sizes and lengths, connection details, blocks, copes, and cuts.
      3. Erection Plan
   3. EXECUTION OF WORK
      1. Fabrication
         1. Member substitutions of details shown on the contract drawings shall be clearly highlighted on the fabrication drawings.
      2. Erection Criteria - General
         1. Erect all structural steel in strict accordance with the drawings, the approved shop drawings and all pertinent regulations and standards.
         2. Erection of structural steel shall be in accordance with the applicable provisions of AISC 325.
         3. Erection plans shall be reviewed, stamped, and sealed by a licensed Structural Engineer.
      3. Erection of Low-Rise Structural Steel Buildings or Building Components
         1. For low-rise structural steel buildings or building components (less than 60’ tall and a maximum of 2 stories), structural steel shall be erected in accordance with AISC DG10.
      4. Tolerances
         1. Align all structural steel straight, plumb and level within tolerances shown in the AISC 303.
      5. Coatings
         1. After erection is complete, touch up all shop priming coats damaged during transportation or erection and prime all field welds on members requiring priming with primary paint specified for shop priming.
         2. Where epoxy or other special coatings are specified, apply per manufacturer’s recommendations.
      6. Welding
         1. All welding operations shall comply with the methods described or referenced by Section 05 05 23 – Welding.
   4. QUALITY ASSURANCE
      1. Undesignated Splices
         1. Shop splices or other joined metals will be permitted only where indicated on the Contract Drawings.
2. MEASUREMENT AND PAYMENT
   1. GENERAL
      1. No separate measurement or payment will be made for the Work required by this section. The cost for this portion of the Work will be considered incidental to, and included in the payments made for the applicable bid items in the [Schedule of Unit Prices] [Lump Sum price bid for the Project].

End of Section

Revision History:

05/01/2014 Conversion to 2004 CSI Numbering System

10/15/2014 Added Sole Source and Salient Characteristics Note to Part 2

01/12/2025 Revised 1.02.B (ASTM), 2.04.D Structural Steel Fasteners, 2.06.A Inspection & Testing