SECTION 05 70 00 – decorative metal

1. General
   1. summary
      1. Supply and install all miscellaneous metal and decorative metal work indicated on drawings and not included in the work of other Sections in addition to items listed in this Section.
   2. RELATED REQUIREMENTS
      1. Carefully read all other Sections and review drawings to determine extent of metal work supplied and installed or installed by others.
      2. Be responsible for co-ordinating this section with all related sections.
   3. REFERENCE STANDARDS
      1. American Society for Testing and Materials (ASTM):
         1. ASTM A53/A53M-12, Standard Specification for Pipe, Steel, Black and Hot Dipped, Zinc Coated, Welded and Seamless
         2. ASTM A276-13, Standard Specification for Stainless Steel Bars and Shapes
         3. ASTM A325-10, Standard Specification for Structural Bolts, Steel, Heat Treated, 120/105 ksi Minimum Tensile Strength
         4. ASTM A653/A653M-11, Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process
         5. ASTM A666-10, Standard Specification for Annealed or Cold-Worked Austenitic Stainless-Steel Sheet, Strip Plate, and Flat Bar
         6. ASTM C939-10, Standard Test Method for Flow of Grout for Preplaced Aggregate Concrete (Flow Cone Method)
         7. ASTM A1011/A1011M-12b, Standard Specification for Steel, Sheet and Strip, Hot-Rolled, Carbon, Structural, High-Strength Low-Alloy, High-Strength Low-Alloy with improved Formability, and Ultra-High Strength
         8. ASTM C1107/C1107M-11, Standard Specification for Packaged Dry, Hydraulic Cement Grout (Nonshrink).
      2. Canadian Standards Association (CSA):
         1. CSA G40.20-04/G40.21-04 (R2009), General Requirements for Rolled or Welded Structural Quality Steel / Structural Quality Steel
         2. CAN/CSA-G164-M92 (R2003), Hot Dip Galvanizing or Irregularly Shaped Articles
         3. CSA-S16-09, Design of Steel Structures
         4. CSA-S136-07, North American Specification for the Design of Cold Formed Steel Structural Members
         5. CSA W47.1-09, Certification of Companies for Fusion Welding of Steel
         6. CSA W55.3-08, Certification of Companies for Resistance Welding of Steel and Aluminum
         7. CSA W59-03 (R2008), Welded Steel Construction (Metal Arc Welding)
      3. Canadian General Standards Board (CGSB):
         1. CAN/CGSB-1.181-99, Ready-Mixed Organic Zinc-Rich Coating
         2. CAN/CGSB-51.32-M77, Sheathing, Membrane, Breather Type
         3. CGSB 31-GP-105Ma, Zinc Phosphate Conversion Coatings for Paint Base
      4. The Association for Materials Protection and Performance (AMPP) (Formerly The Society for Protective Coatings (SSPC)):
         1. SSPC1 Solvent Cleaning - 2004
         2. SSPC2 Hand Tool Cleaning - 2004
         3. SSPC-3 Power Tool Cleaning - 2004
         4. SSPC-6 Commercial Blast Cleaning - 2007
   4. QUALITY ASSURANCE
      1. All Codes and Standards referred to in this Specification shall be current editions including all latest revisions and addenda.
      2. Conform to requirements of CSA-S16, Design of Steel Structures and CAN/CSA-S136, Cold Formed Steel Structural Members.
      3. Architectural metals work shall be of the highest architectural quality, free of scratches, pitting, roughness, marring, discolouration, staining and other imperfections.
      4. Work of this Section to be executed by firm thoroughly conversant with laws, by-laws and regulations which govern, and capable of workmanship of best grade of modern shop and field practice known to recognized manufacturer's specializing in this work.
      5. Work of this Section shall be executed by workers especially trained and experienced in this type of work. Have a full time, senior, qualified representative at the site to direct the work of this Section.
      6. Where required by authorities having jurisdiction, have work of this Section designed by a professional engineer licensed to design structures and registered in the Province of the Work.
   5. SUBMITTALS
      1. Provide submittals in accordance with Section 01 33 00 – Submittal Procedures, bearing stamp or seal and signature of the Professional Engineer responsible for the design of the work of this Section.
      2. Shop Drawings:
         1. Make thorough examination of drawings and details, determine the intent, extent, and materials, and be fully cognizant of requirements when preparing shop drawings.
         2. Submit shop drawings showing and describing in detail all work of this Section including large scale detail of members and materials, of connection and interfacing with work of other Sections, jointing details, and of anchorage devices, dimension, gauges, thicknesses, description of materials, metal finishing, as well as other pertinent data and information.
         3. Digital files of design drawings shall not be used in the preparation of shop drawings.
   6. STORAGE, DELIVERY, HANDLING AND PROTECTION
      1. Coordinate deliveries to comply with construction schedule and arrange ahead for strategic off the ground, under cover storage locations. Do not load any area beyond the design limits.
      2. Adequately protect and crate all components against damage, dirt, disfigurement and weather during delivery and storage. Damaged materials shall not be used and shall be replaced by approved material.
      3. Cover and protect the work of other Sections in the area of work from damage. Make good all damage to the satisfaction of the Consultant.
      4. Protect the installed work of this Section and on completion the work shall be examined, and damage shall be remedied to the complete satisfaction of the Consultant.
2. Products
   1. MATERIALS
      1. Structural Steel Sections and Steel Plate: New stock (not weathered or rusted); to conform to CAN/CSA-G40.21, Grade 300W (44W) and Grade 350W (50W) for wide flange shapes.
      2. Hollow Structural Sections (HSS): New stock; to conform to CAN/CSA-G40.21, Grade 350W (50W), Class C, stress relieved.
      3. Sheet Steel (Structural Quality): Conforms to ASTM A1011/A1011M.
      4. Sheet Steel (Commercial Quality): Conforms to ASTM A653/A653M, stretcher levelled, or temper rolled.
      5. Tube: Conforms to ASTM A53.
      6. Galvanized Sheet Steel (Commercial Quality): Galvanized coating G90 (Z275) in accordance with ASTM A653/A653M, minimized spangle, stretch levelled or temper rolled. Specially treat by phosphate conversion process conforming to CGSB 31-GP-105Ma ready to receive prime paint finish.
      7. Steel Pipe: Hot dip galvanized, zinc coated, welded and seamless type steel pipe conforming to ASTM A53/A53M.

SPEC NOTE: Keep the following finishes required on the project and delete the ones not required. Remove Stainless Steel and/or Aluminum materials when not required.

* + 1. Stainless Steel Sheet, Strip, Plate, and Flat Bars: In accordance with ASTM A666, Type 304.
    2. Stainless Steel Bars and Shapes: In accordance with ASTM A276, Type 304.
    3. Aluminum Plate and Sheet: ASTM B209M, Alloy 6061-T6.
    4. Aluminum Extrusions: ASTM B221M, Alloy 6063-T6.
    5. Non-Shrink Grout: Premixed, high strength, maximum bearing, impact resistant, non-shrink non-metallic aggregate grout having minimum 76 Mpa 28-day compressive strength and conforms to ASTM C939 and ASTM C1107/C1107M, 'Embeco Premixed Grout' by Master Builders Technologies Ltd., or 'Tartan Grout Iron' by Webster & Sons Ltd., or 'Sika Grout 212 HP' by Sika Canada Inc.
    6. Primer Paint: CISC/CPMA 2-75.
    7. Bolts, Nuts, Washers: Conforms to ASTM A325.
    8. Welding Materials: Conforms to CSA W59.
    9. Metal Filler: Polyester based type.
    10. Painting:
        1. Shop Applied Structural Steel Primer: Steel Spec Universal Primer (B50RV6227 Red), by Sherwin Williams Company of Canada Ltd., or approved equal. Apply a minimum of 2 mils dft./coat. Grey coloured primer is acceptable.
        2. Touch-up Primer (On Site): Procryl Universal Acrylic Primer by Sherwin Williams Company of Canada Ltd or approved equal. Touch-up primer shall be no less than 3 mil dft.
        3. Refer to Section 09 91 23 – Interior Painting, and coordinate with the above.
    11. Isolation Coating: Acid and alkali resistant bituminous paint.
    12. Building Paper: Conforms to CAN/CGSB-51.32.
    13. Butyl Tape: Extruded, high grade, macro-polyisobutylene tape of size, width, and shore hardness to suit conditions.
  1. FABRICATION
     1. Fit and assemble work in shop where possible. Execute work according to details and reviewed shop drawings.
     2. Take measurements at the building for work which is to fit or be connected to steel or concrete before commencing fabrication.
     3. Where shop fabrication is not possible, make trial assembly in shop.
     4. Do all welding in accordance with requirements of CSA W59, CSA W55.3 and CSA W47.1 including all supplements. Weld stainless steel electric arc process. Grind welds smooth and flush with surface of parent metal, where exposed to view and where specifically indicated on drawings. Welds shall be continuous seam welds unless specified otherwise. Maintain sharp arises.
     5. Fit joints and intersecting members accurately in true planes, square, plumb, straight with tight joints and intersections.
     6. Provide adequate reinforcing, fastenings, anchors, accessories required for fabrication and erection of work of this Section. Such items occurring on or in an exterior wall or slab shall be hot dip galvanized. Make thread dimensions such that nuts and bolts will fit without rethreading or chasing threads.
     7. Fabricate, drill, and tap members to accommodate attachments, anchorage and work of other Sections where located and directed by them.
     8. Exposed steel surfaces shall be smooth and free from imperfections such as warping, buckling, weld marks, burrs, rust, and scale.
     9. Gauges and sizes of metal shall be adequate for various conditions.
     10. Make exposed metal fastenings and accessories of same material, texture, colour, and finish as base metal on which they occur unless otherwise shown or specified. Keep exposed fastenings to an absolute minimum evenly spaced and neatly laid out. Make fastenings of permanent type unless otherwise indicated.
  2. SHOP PAINTING AND PROTECTION
     1. As per SSPC2 Hand Tool Clean and SSPC1 Solvent Clean, clean welds by wire brushing and wash down with clean water, to remove the chemical residues left by the electrodes, prior to painting.
     2. Prepare steel as per SSPC-3 Power Tool Cleaning for Interior or SSPC-6 Commercial Blast Cleaning for exterior members. Remove rust, mill scale, oil, dirt, and other foreign matter before commencing shop painting.
     3. Apply shop coat of primer to all surfaces except areas requiring field welding. Apply by brush, working paint well into surfaces, interstices, and cavities.
     4. Primer is to be free of runs, sags, or other collections of primer due to dipping of members into primer.
     5. Steel work shall be painted under cover, and shall remain under cover, until the paint protection is dry.
     6. Prime field welded areas after erection and touch up shop coat where damaged and barred by erection and handling.
     7. Prime steel with two full coats of paint in strict accordance with paint manufacturer's directions.
     8. Give the parts which are inaccessible after assembly two coats of primer coat paint of different colours, when members are noted to be painted.

SPEC NOTE: Please remove the following finishes not required on the project.

* 1. ALUMINUM FINISHES
     1. Finish designations prefixed by AA comply with the system established by the Aluminium Association for designating aluminium finishes.
     2. As Fabricated Finish (Mill Finish): AA-M10, as fabricated mechanical finish.
     3. Clear Anodized Finish:
        1. Class II Finish: Architectural Class II, clear coating 0.010 mm or thicker in accordance with AAMA 611.
     4. Black Coloured Anodized Finish:
        1. Class II Finish: Architectural Class II, integrally coloured or electrolytically deposited colour coating 0.010 mm or thicker in accordance with AAMA 611.
  2. STAINLESS STEEL FINISHES
     1. Polish Finish: Apply finish after fabrication. Remove tool and die marks and stretch lines or blend into finish. When polishing is completed, passivate and rinse surfaces. Remove embedded foreign matter and leave surfaces chemically clean.
        1. Directional Polish: AISI No. 4 bright satin finish. Grind and polish surfaces to produce uniform, directionally textured, polished finish, free of cross scratches. Run grain with long dimension of each piece.

1. Execution
   1. GENERAL
      1. Verify at site that the Work to receive the work of this Section is free of irregularities detrimental to the installation and performance of the work and that it is located correctly and at proper levels before delivery and installation.
      2. Erection: To meet specified requirements of CAN/CSA-S16.
      3. Bearing Plates and Anchors: Standard.
      4. Anchors: Anchors to structural concrete shall be approved inserts set into concrete or approved self-drilling expansion insets drilled and placed afterwards.
   2. INSTALLATION
      1. Assemble and erect work plumb, true, square, straight, level and accurate to sizes detailed, to reviewed shop drawings, free from distortion and defects detrimental to appearance and performance.
      2. Isolate metals where necessary to prevent corrosion due to contact between dissimilar metals and between metals and masonry, concrete or plaster. Use bituminous paint or butyl tape.
      3. Supply adequate instructions, templates, and if necessary, supervise installation of the fastenings or accessories requiring to be built-in by other Sections of the Work.
   3. SCHEDULES
      1. Where items are required to be built into masonry, concrete or other work, supply such items to respective Sections with all anchors and accessories for building in.
      2. Itemized List: Supply and install metal work listed below unless specifically designated to be supplied only. Each item shall be as shown on drawings and as detailed on reviewed shop drawings.
      3. Miscellaneous Steel Framing, Channels, Angles, Plates and Brackets: As required and indicated on drawings.

SPEC NOTE: Please edit the following paragraphs to include items that are on the project. Delete all other items below that are not required.

SPEC NOTE: Included below are only examples.

* + 1. Corner Bead: 1-1/4” square stainless steel corner bead, inside corners between fabric wall panels and glass panels.
    2. Stretched Fabric Frame: 1” wide x 1-1/4” deep stainless-steel U-channel frame around stretched fabric panels, as indicated on the Drawings.
    3. Frameless Glass Partition Channels: Top and bottom channel, 1-1/2” x 1-1/2” stainless steel U-channels; Top channel recessed into ceiling, as indicated on the Drawings.
    4. L-Shaped Trim: 1” x 1” stainless steel trim, as indicated.
    5. Other Miscellaneous Metal Components:
       1. As required and indicated on drawings.
       2. Finish: Prime paint for interior components, ready for finishing by   
          Section 09 91 23 – Interior Painting.

END OF SECTION