

- 1** General
- 1.1** **SECTION INCLUDES**
 - .1 Design, labour, Products, equipment and services necessary for the miscellaneous and metal fabrication Work in accordance with the Contract Documents.
- 1.2** **REFERENCES**
 - .1 ANSI/BHMA A156.21, American National Standard for Thresholds.
 - .2 ASTM A108, Standard Specification for Steel Bar, Carbon and Alloy, Cold-Finished
 - .3 ASTM A123, Specification for Zinc (Hot Dip Galvanized) Coatings on Iron & Steel Products.
 - .4 ASTM A153, Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware.
 - .5 ASTM A269, Specification for Seamless and Welded Austenitic Stainless Steel Sanitary Tubing for General Service.
 - .6 ASTM A307, Specification for Carbon Steel Bolts and Studs, 60,000 psi Tensile Strength.
 - .7 ASTM A653/A653M, Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvanealed) by the Hot-Dip Process.
 - .8 CAN/CSA-G40.20/G40.21-M, General Requirements for Rolled or Welded Structural Quality Steel/ Structural Quality Steels.
 - .9 CAN/CSA S16.1-M, Limit States Design of Steel Structures.
 - .10 CSA S136.1-M, Commentary on CAN/CSA S136-M, Cold Formed Steel Structural Members.
 - .11 CSA W47.1, Certification of Companies for Fusion Welding of Steel Structures.
 - .12 CSA W48, Filler Metal and Allied Materials for Metal Arc Welding.
 - .13 CSA W59-M, Welded Steel Construction (Metal Arc Welding).
 - .14 CAN/CSA W117.2-M, Safety in Welding, Cutting and Allied Processes.
 - .15 CGSB 1-GP-181, Organic Zinc Rich Primer.
 - .16 NAAMM, The National Association of Architectural Metal Manufacturers.
 - .17 Steel Structures Painting Council (SSPC), Steel Structures Painting Manual, Vol. 2.
- 1.3** **DESIGN REQUIREMENTS**
 - .1 Design details and connections, where not shown on Drawings, in accordance with CAN/CSA-S16.1 and CSA S136.1.
 - .2 All exposed metal, including both steel and aluminum to have eased edges and corners. No sharp edges are permitted.
- 1.4** **SUBMITTALS**

- .1 Shop drawings:
 - .1 Submit shop drawings for fabrication and erection of miscellaneous and metal items in accordance with Section 01 10 10 indicating:
 - .1 Materials, core thicknesses, class of finish (AMP 555), connections, joints, method of anchorage, number of anchors, supports, reinforcement, details, and accessories.
 - .2 Ensure shop drawings are of one uniform size and based on field measurements.
 - .2 Samples:
 - .1 Submit samples of the following:
 - .1 Two 300 x 300 samples of metal demonstrating finish and colour of galvanized steel with clear finish for the Consultant's approval.
- 1.5 **QUALITY ASSURANCE**
 - .1 Retain a Professional Engineer, licensed in the Province of Ontario, with experience in Work of comparable complexity and scope, to perform the following services as part of the Work of this Section:
 - .1 Design oversized hollow metal frames, hollow metal doors, hollow metal glazing transom, hollow metal sidelite, and metal fabrication items that are required to resist live, dead, lateral, wind, or seismic loads.
 - .2 Design millwork, bench, sliding grills supports
 - .3 Review, stamp, date and sign shop drawings.
 - .2 Workmanship: Fabricate Work of this Section to meet the required class of workmanship indicated below in accordance with AMP 555, Section 8.
 - .1 Class 1: for use on direct exposed to view fabricated items:
 - .1 Exposed surfaces are finished smooth with pitts, mill marks, nicks, burrs, sharp edges, and scratches filled or ground off. Defects should not show when painted, polished, or finished. .
 - .2 Welds should be concealed where possible. Exposed welds are ground to small radius with uniform sized cove unless otherwise noted.
 - .3 Distortions should not be visible to the eye.
 - .4 Exposed joints are fitted to a hairline finish.
 - .3 Execute welding by firms certified in accordance with CSA W47.1 Division 1 or 2.1. Ensure welding operators are licensed per CSA W47.1 for types of welding required by Work.

2 Products

2.1 MATERIALS

.1 General:

- .1 All materials under Work of this Section, including but not limited to, primers and paints are to have low VOC content limits.
- .2 Unless detailed or specified herein, standard products will be acceptable if construction details and installation meet intent of Drawings and Specifications.
- .3 Include all materials, products, accessories, and supplementary parts necessary to complete assembly and installation of Work of this Section.
- .4 Incorporate only metals that are free from defects which impair strength or durability, or which are visible. Install only new metals of best quality, and free from rust or waves and buckles, and that are clean, straight, and with sharp defined profiles.

.2 Structural shapes, plates, and similar items:

- .1 Conforming to CAN/CSA-G40.20/G40.21-M, Grade 350W.
- .2 Hollow structural sections: CAN/CSA-G40.20/G40.21-M, Grade 350W, Class H.
- .3 Provide cold rolled steel for exposed metal items.
- .4 Standard field painted finish: In accordance with Section 09 91 00.
- .5 High performance steel coatings on steel material (PT-10 and STL-2): In accordance with Section 09 97 13 for finish PT-10, for use on STL-2 changeroom steel supports and additional areas as indicated.

.3 Galvanized sheet steel: ASTM A653/A653M Grade A, Z275 Commercial Quality zinc coating, size and shape as shown.

- .1 G90 galvanized steel (STL-1).

.2 Welding materials: CSA W48 and CSA W59-M.

.3 Fasteners: Conforming to ASTM A307, Grade A, in areas not exposed to view, use unfinished bolts with hexagon heads and nuts. In areas exposed to view, use bolts, nuts, washers, rivets, lock washers, anchor bolts, machine screws and machine bolts Z275 zinc coated in accordance with ASTM A653/A653M. Supply bolts of lengths required to suit thickness of material being joined, but not projecting more than 6 mm beyond nut, without the use of washers.

.4 Galvanized primer paint: Inorganic zinc rich primer. For use on galvanized fabrications where touch up is to remain unpainted in finished work; Carbozinc 11WB by Carboline Company, Catha-Coat 305 by Devoe Coatings or Zinc Clad XI by Sherwin Williams.

- .5 Drilled inserts: Mega by ITW Construction Products or HSL by Hilti Inc. heavy-duty anchors, sizes as shown.
- .6 Sleeve anchors: Sleeve anchors, 'HLC Sleeve Anchors, Flat Phillips Head - HLC-FPH 3.8 x 4' by Hilti or approved alternative with countersink flush. Provide sleeve anchors for bolting of steel posts to floor where bolts indicated to be exposed.

2.2 **FABRICATION**

- .1 Verify dimensions of existing Work before commencing fabrications and report any discrepancies to the Consultant.
- .2 Fit and assemble Work in shop where possible. Execute Work in accordance with details and reviewed shop drawings.
- .3 Use self-tapping shake-proof screws on items requiring assembly by screws or as indicated. Use screws for interior metal work. Use welded connections for exterior metal Work unless otherwise found acceptable by the Consultant.
- .4 Ensure exposed welds are continuous for length of each joint. File or grind exposed welds smooth and flush. Seal exterior steel fabrications against corrosion in accordance with CAN/CSA S16.1-M.
- .5 Execute shop welding to requirements specified.
- .6 Carefully make and fit details. Take special care with exposed finished Work to produce a neat and correct appearance to the Consultant's acceptance.
- .7 Assemble members without twists or open joints.
- .8 Correctly size holes for connecting Work of other trades where such can be determined prior to fabrication. Where possible, show holes on shop drawings. Place holes not to cause appreciable reduction in strength of member.
- .9 Draw mechanical joints to hairline tightness and seal countersunk screw and access holes for locking screws with metal filler where these occur on exposed surfaces.
- .10 Exposed metal edges shall be eased to prevent sharp edges and corner conditions.

2.3 **FABRICATED ITEMS**

- .1 Refer to Drawings for details of metal fabrication work and related items not specifically listed in this Section.
- .2 Where work is required to be built into work of other Sections supply such members to respective Sections.
- .3 Provide metal fabrication items indicated below and items not indicated to be supplied under other Sections. The following items includes miscellaneous and metal fabrication including but not limited to the items listed below.
- .4 Vanity (MW-2), Washroom basin counter (MW-1A and MW-1B), supports:
 - .1 Provide supports for vanity counters. Construct support as detailed. Where

indicated, conceal supports within cavity of partition.

- .2 Provide all drill holes required for concealed anchorage of counters and for anchoring to building structure.
- .3 Supports to be field painted
- .4 Coordinate with SECTION 06 20 00.
- .5 Shelf Angles: Of size indicated on Drawings and as specified in structural steel specifications, with adjustable inserts for vertical adjustment and slotted holes for horizontal; galvanized.
- .6 Metal support framing for general millwork, concealed items
- .7 Metals requested to support glazed screens, partitions and doors.
- .8 Miscellaneous steel brackets, supports and angles for Gymnasium Dividers (STL-3).
- .9 Miscellaneous steel brackets, supports and angles:
 - .1 Supply and install or supply for installation by trades responsible, all loose steel brackets, supports and angles where indicated, except where such brackets, supports and angles are specified under work of other Sections. Drill for countersunk screws, expansion anchors and anchor bolts.
 - .2 Unless otherwise specified, prime paint for interior installation; hot dipped galvanized steel galvanized finish for exterior installation.

2.4 **ANCHORS AND FASTENING**

- .1 Use weld studs of size not larger than 10 mm for attaching miscellaneous materials and equipment to building steel. If weight of item requires larger fasteners use clips or brackets and secure by welding or through bolting.
- .2 Use self drilling expansion type concrete anchors for attaching to masonry and concrete
- .3 Do not secure items to steel deck.

2.5 **WELDING**

- .1 Perform welding by electric arc process.
- .2 Execute welding to avoid damage or distortion to Work. Execute welding in accordance with following standards:
 - .1 CSA W48 - for Electrodes. If rods are used, only coated rods are allowed.
 - .2 CSA W59-M and CSA W59S1-M for design of connections and workmanship.
 - .3 CAN/CSA W117.2-M - for safety.
- .3 Thoroughly clean welded joints and expose steel for a sufficient distance to perform welding operations. Finish welds smooth. Supply continuous and ground welds

which will be exposed to view and finish paint.

- .4 Test welds for conformance and remove Work not meeting specified standards and replace to Consultant's acceptance.

2.6 **HOT DIP GALVANIZING**

- .1 After fabrication, hot dip galvanize specific miscellaneous steel items as indicated. After galvanizing, plug relief vents air tight with appropriate aluminum plugs as suitable and required for intended metal fabricated item. Straighten shapes and assemblies true to line and plane after galvanizing. Repair damaged galvanized surfaces with zinc rich primer in accordance with manufacturer's printed directions.
- .2 Hot-dip galvanize members in accordance with requirements of the following ASTM, with minimum coating weights or thicknesses as follows:
 - .1 Rolled, pressed and forged steel shapes, plates, bars and strips: ASTM A123; average weight of zinc coating per square/metre of actual surface, for 4.8 mm and less thickness members 600 g/m² for 6 mm and heavier members 640 g/m².
 - .2 Iron and steel hardware: ASTM A153; minimum weight of zinc coating, in ounces per square foot of surface, in accordance with ASTM A153, Table 1 for the various classes of materials used in the Work.

2.7 **SHOP PAINTING**

- .1 Clean steel to SSPC SP6 and remove loose mill scale, weld flux and splatter.
- .2 Shop prime steel with one coat of primer paint to dry film thickness of 0.07 mm. Paint on dry surfaces, free from rust, scale, grease. Do not paint when temperature is lower than 7 deg C. Paint items under cover and leave under cover until primer is dry. Follow paint manufacturer's recommendations regarding application methods, equipment, temperature, and humidity conditions.
- .3 Shop prime galvanized steel in accordance with CGSB 85-GP-16M.
- .4 Clean but do not paint surfaces being welded in field.
- .5 Do not paint surfaces embedded in concrete, but clean as if they were to be primed.
- .6 Do not prime steel to be fireproofed or to receive intumescent paint coating.
- .7 Do not prime machine finished surfaces, but apply an effective anti-rust compound.
- .8 Take precautions to avoid damage to adjacent surfaces.

3 Execution

3.1 **EXAMINATION**

- .1 Examine previously installed Work, upon which this Section depends, verify dimensions and condition of existing Work, and coordinate repairs, alterations, and rectification if necessary. Commencement of Work of this Section is deemed to

signify acceptance of existing, prior conditions.

- .2 Obtain Consultant's written approval prior to field cutting or altering of structural members.

3.2 ERECTION

- .1 Install metal fabrications in accordance with reviewed shop drawings and manufacturer's written instructions.
- .2 Fit joints and intersecting members accurately. Make Work in true planes with adequate fastenings. Build and erect Work plumb, true, square, straight, level and accurate to sizes detailed, free from distortion or defects detrimental to appearance or performance.

3.3 TOUCH UPS

- .1 Paint bolt heads, washers, nuts, field welds and previously unpainted items. Touch up is to remain unpainted in finished work; Carbozinc 11WB by Carboline Company, Catha-Coat 305 by Devoe Coatings or Zinc Clad XI by Sherwin Williams.

END OF SECTION

- 1** General
- 1.1** **SECTION INCLUDES**
 - .1 Labour, Products equipment and services necessary for the finish carpentry Work in accordance with the Contract Documents.
- 1.2** **REFERENCES**
 - .1 ANSI A208.1, Particleboard.
 - .2 ANSI/HPVA HP-1, Hardwood and Decorative Plywood.
 - .3 ANSI A208.2, Medium Density Fibreboard for Interior Use.
 - .4 ANSI/NEMA LD 3, High-Pressure Decorative Laminates.
 - .5 APA - The Engineered Wood Association.
 - .6 ASTM F1667, Driven Fasteners: Nails, Spikes and Staples.
 - .7 Architectural Woodwork Manufacturers Association of Canada (AWMAC).
 - .8 Architectural Woodwork Standards (AWS) - Quality Standards for Architectural Woodwork.
 - .9 CAN/CSA O141, Softwood Lumber.
 - .10 CSA O151-M, Canadian Softwood Plywood.
 - .11 National Hardwood Lumber Association (NHLA) Rules for the Measurement and Inspection of Hardwood and Cypress.
 - .12 National Lumber Grades Authority (NLGA) Standard Grading Rules for Canadian Lumber.
- 1.3** **SUBMITTALS**
 - .1 Shop drawings: Submit shop drawings of finish carpentry Work in accordance with Section 01 10 10 indicating materials, thicknesses, sizes, finishes, wood species, grades, profiles, connection attachments, shop jointing, field jointing, reinforcing, anchorage, fastener types and sizes, location of exposed fastenings, mechanical and electrical service routes, service outlets, cutout locations, and sizes. Include erection drawings, plans, elevations, sections, and details as applicable.
 - .2 Samples: Submit samples of the following in accordance with the requirements of Section 01 10 10:
 - .1 Two representative pieces of each type of wood to receive a stained or natural finish.
 - .2 Two representative pieces of each type of wood finished as specified.
 - .3 Two of each colour, pattern, gloss, and texture of plastic laminate, in manufacturer's standard tag size.

- .4 Two samples of laminated plastic joints, edging, cutouts and postformed profiles.
- .5 Two of each solid surface, in 100 x 75 x 12 mm samples.
- .6 Two samples of melamine surfaced board, edging and postformed profiles.
- .7 One of each item of finish carpentry hardware.

1.4 QUALITY ASSURANCE

- .1 Execute Work of this Section by member of AWMAC, with 5 years experience in finish carpentry Work of comparable complexity and scope. Submit proof of experience upon Consultant's request.
- .2 Fabricate finish carpentry Work in accordance with AWS Quality Standards, Premium Quality materials and installation unless otherwise indicated. Perform Work in accordance with the definition of Good Workmanship as defined in the AWS Quality Standards.
- .3 Remove and replace finish carpentry Work which does not conform to the AWS Quality standards or as amended by these Specifications.
- .4 Mock-up:
 - .1 Shop fabricate 6 samples of stain finish of WD-1 to match existing, complete with joints between panels, corner condition, installed in location acceptable to Consultant.
 - .2 Arrange for Consultant's review and acceptance, allow 48 hours after acceptance before proceeding with Work.
 - .3 When accepted, mock-up will demonstrate minimum standard for this work. Mock-up may remain as part of Work if accepted by Consultant. Remove and dispose of mock-ups which do not form part of Work.

1.5 DELIVERY, STORAGE, AND HANDLING

- .1 Deliver, store, and handle finish carpentry in accordance with the AWS Quality Standards. Control the temperature and humidity in accordance with the AWS recommendations, before, during, and after finish carpentry delivery, and also during storage and installation.
- .2 Cover finished plastic laminated work with heavy kraft paper or put in cartons during shipment. Protect installed surfaces by approved means. Do not remove until immediately before final inspection.

1.6 EXTENDED WARRANTY

- .1 Submit an extended warranty for plastic laminate work of this Section in accordance with General Conditions, except that warranty period is extended to 2 years from date of Substantial Performance of the Work.

- .1 Warrant against defects in material and workmanship including but not limited to opening of joints, cracking, shrinkage, warpage, and delamination of plastic laminate.
- .2 Coverage: Complete replacement including affected adjacent Work.

2 Products

2.1 MATERIALS

- .1 General: All materials under Work of this Section, including but not limited to, adhesives and mastics, are to have low VOC content limits.
- .2 Hardwood lumber: Ash, unless otherwise indicated, to NHLA and AWS Premium Grade, S4S, average moisture content 7% +/- 2% at installation.
- .3 Solid Surfacing (SOL):
 - .1 13 mm thick sheet stock, provide with bullnose edge and all cutouts as required. 'Corian' solid surfacing by DuPont or approved alternative. Allow for three colours to be selected by Consultant.
 - .2 Installation and seam adhesives to be as recommended by solid surfacing manufacturer, colour matched to solid surfacing.
 - .3 Colours:
 - .1 SOL-1: Corian Selected by Consultant from full range of standard colours
- .4 Particle board core: ANSI A208.1, Grade M2 of thickness indicated with WD-3 veneer at cabinet doors. Particleboard to be bound with waterproof adhesive and meeting the following minimum criteria:
 - .1 Density: minimum 705 kg/m³.
 - .2 Internal bond: 0.45 N/mm².
 - .3 Modulus of rupture: 14.5 N/mm².
 - .4 Modulus of elasticity: 2250 N/mm².
 - .5 Face screw holding: 1000 N.
 - .6 Edge screw holding: 900 N.
- .5 Fire retardant coating: Provide clear fire retardant coating to plywood panels at the underside of the new furnace installations. Two component, VOC free coating providing Class A Flame Spread rating to ASTM E84. 'Safecoat Clear Fire Retardant Coating' as manufactured by Quantum Group of Companies or approved alternative.
- .6 Draw bolts and splines: Type as recommended by fabricator.

- .7 Nails and staples: Conforming to ASTM F1667; Size and type to suit application, galvanized for exterior work, interior humid areas and for treated lumber; plain finish elsewhere.
- .8 Bolts, nuts, washers, blind fasteners, lags and screws: Size and type to suit application. Stapling is not acceptable.
- .9 Adhesive and bituminous mastic: Selected by the millwork fabricator with low VOC content.
- .10 Miscellaneous metals: In accordance with Section 05 50 00.
- .11 Finishing: In accordance with Section 09 91 00.

2.2 **HARDWARE**

2.3 **FABRICATION**

- .1 Be responsible for methods of construction and for ensuring that materials are rigidly and securely attached and will not be loosened by the work of other sections.
- .2 Coordinate locations of concealed supports and blocking with other parts of Work. Provide cutouts for outlet boxes and other fixtures.
- .3 Fabricate work in a manner which will permit expansion and contraction of the materials without visible open joints. Conceal joints and connections in wherever possible.
- .4 Set nails and countersink screws, apply wood filler to indentations, sand smooth and leave ready to receive finish.
- .5 Mitre exposed corners, no end grain shall be visible in completed installation.
- .6 Finish millwork in accordance with Section 09 91 00. Finished millwork shall be free from bruises, blemishes, mineral marks, knots, shakes and other defects and shall be selected for uniformity of colour, grain and texture.
- .7 Shelving to cabinetwork to be adjustable unless otherwise noted.
- .8 Recess shelf standards, unless noted otherwise. Stagger recessed shelf standards on opposite sides of divider.
- .9 Do not exceed maximum 760 mm unsupported span for 19 mm thick shelving. House fixed shelving into gables and divisions.
- .10 Shop assemble finish carpentry to accommodate delivery and handling and to ensure passage through building openings.
- .11 Shop install cabinet hardware for doors, shelves and drawers. Recess shelf standards unless noted otherwise.
- .12 Fabricate sills, screens, frames, benches and moldings to profiles shown.

- .13 Fire retardant coating: Apply fire retardant fire coating to floor plywood panels at the underside of new furnace installations in accordance with manufacturer's written instructions.
- 3 Execution**
- 3.1 EXAMINATION**
 - .1 Verify condition and dimensions of previously installed Work upon which this Section depends. Report defects to Consultant. Commencement of Work means acceptance of existing conditions.
- 3.2 INSTALLATION**
 - .1 Install Work in accordance with AWS Quality Standards and tolerances for Architectural Woodwork. Set and secure finish carpentry in place, rigid, plumb, square, and level.
 - .2 Scribe and cut as required, fit to abutting walls, and surfaces, fit properly into recesses and to accommodate columns, fixtures, outlets, or other projecting, intersecting or penetrating objects leaving a 0.8 mm gap maximum.
 - .3 Coordinate cutouts for plumbing fixtures, inserts, appliances, outlet boxes, and other fixtures, in finish carpentry. Round internal corners of cut-outs and seal exposed cores.
 - .4 Form joints to conceal shrinkage.
 - .5 Install draw bolts and splines in laminated plastic counter top joints at maximum spacing 450 mm o.c., and 75 mm from edge. Make joints flush, hairline butt joints.
 - .6 Install finishing hardware accurately and securely in accordance with manufacturer's directions, adjust and clean.
 - .7 Install prefinished millwork at locations shown on drawings. Position accurately, level, plumb straight.
 - .8 Apply bituminous coating over wood framing members in contact with masonry or cementitious construction.
 - .9 Supply and install kiln-dried clear Grade "A" Western Red Cedar (refer to details).
 - .10 Melamine panels: Assemble melamine millwork using dowelled/wafered-and-glue construction. Installed melamine panels shall not show any exposed fasteners on finished/exposed surfaces.
 - .11 Solid surfacing:
 - .1 Install solid surfacing in accordance with manufacturer's instructions.
 - .2 Align work plumb and level.
 - .3 Seal perimeter of fabrication to adjacent construction in accordance with Section 07 92 00.

- .12 Vanity MW-1A and Vanity MW-1B and Counter MW-2:
 - .1 Construct countertop sizes and details as noted.
 - .2 Countertop to be SOL.
 - .3 Anchor wood to supports in a concealed manner.
 - .4 Mitre joints at corners. Keep joints to a minimum.
 - .5 Round all corners, edges and ends.
 - .6 Install brackets and supports supplied under work of Section 05 50 00.
- .13 Fastening:
 - .1 Coordinate wall securement, anchorage, and blocking for finish carpentry items.
 - .2 Position items of finished carpentry work accurately, level, plumb, true and fasten or anchor securely.
 - .3 Design and select fasteners to suit size and nature of components being joined. Use proprietary devices as recommended by manufacturer.
 - .4 Provide heavy duty fixture attachments for wall mounted cabinets.
 - .5 Set finishing nails to receive filler. Where screws are used to secure members, countersink screw in round cleanly cut hole and plug with wood plug to match material being secured.
- .14 Remove and replace damaged, marked, or stained finish carpentry.

END OF SECTION