

1 GENERAL

1.01 RELATED REQUIREMENTS

- .1 Section 05 50 00 - Metal Fabrications.
- .2 Section 06 20 00 - Finish Carpentry
- .3 Section 07 62 00 - Sheet Metal Flashing and Trim.
- .4 Section 07 61 00 - Sheet Metal Roofing.
- .5 Section 10 28 10 - Toilet and Bath Accessories.

1.02 REFERENCES

- .1 Canadian Roofing Contractors' Association (CRCA)
 - .1 CRCA Roofing Specification Manual, 2012.
- .2 ASTM International
 - .1 ASTM A123/A123M-15, Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products.
 - .2 ASTM A307-14, Standard Specification for Carbon Steel Bolts and Studs, 60,000 PSI Tensile Strength.
 - .3 ASTM A653/A653M-15e1, Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
 - .4 ASTM C954-15, Standard Specification for Steel Drill Screws for the Application of Gypsum Panel Products or Metal Plaster Bases to Steel Studs from 0.033 in. (0.84 mm) to 0.112 in. (2.84 mm) in Thickness
 - .5 ASTM D1165-13, Standard Nomenclature of Commercial Hardwoods and Softwoods.
 - .6 ASTM D1761 12, Standard Test Methods for Mechanical Fasteners in Wood.
 - .7 ASTM D3931-08(2015), Standard Test Method for Determining Strength of Gap-Filling Adhesive Bonds in Shear by Compression Loading.
 - .8 ASTM D5456-14b, Standard Specification for Evaluation of Structural Composite Lumber Products.

- .9 ASTM E1333-14, Standard Test Method for Determining Formaldehyde Concentrations in Air and Emission Rates from Wood Products Using a Large Chamber.
- .10 ASTM F1667-15, Standard Specification for Driven Fasteners: Nails, Spikes, and Staples.
- .3 CSA Group (CSA)
 - .1 CAN/CSA O80-Series-15, Wood Preservation.
 - .2 CSA O86-14, Engineering Design in Wood.
 - .3 CSA O112-Series M1977 (R2006), CSA Standards for Wood Adhesives.
 - .4 CSA O121-08(R2013), Douglas Fir Plywood.
 - .5 CSA O141-05(R2014), Softwood Lumber.
 - .6 CSA O151-09(R2014), Canadian Softwood Plywood.
 - .7 CAN/CSA O325-16, Construction Sheathing.
 - .8 CSA O325-16, Construction Sheathing.
 - .9 CSA O437 Series-93(R2011), Standards on OSB and Waferboard.
 - .10 CSA S16-14, Design of steel structures.
 - .11 CSA W47.1-09 (R2014), Certification of companies for fusion welding of steel.
- .4 Canadian Commission on Building and Fire Codes/National Research Council of Canada
 - .1 National Building Code of Canada (NBC), edition adopted and currently enforced by the Province of Nova Scotia.
- .5 National Research Council Canada (NRC)
 - .1 National Building Code of Canada (NBC), edition adopted and currently enforced by the Province of nova Scotia.
- .6 South Coast Air Quality Management District (SCAQMD), California State, Regulation XI. Source Specific Standards
 - .1 SCAQMD Rule 1113-16, Architectural Coatings.
 - .2 SCAQMD Rule 1168-A2011, Adhesives and Sealants Applications.
- .7 The Truss Plate Institute of Canada
 - .1 TPIC 2014, Truss Design Procedures and Specifications for Light Metal Plate Connected Wood Trusses.
- .8 Underwriters' Laboratories of Canada (ULC)
 - .1 CAN/ULC S102-10, Method of Test for Surface Burning Characteristics of Building Materials and Assemblies.

1.03 ACTION AND INFORMATION SUBMITTALS

- .1 Submit in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Product Data:
 - .1 Submit manufacturer's instructions, printed product literature and data sheets for wood products and accessories and include product characteristics, performance criteria, physical size, finish and limitations.

1.04 QUALITY ASSURANCE

- .1 Lumber identification: Grade stamp of an agency certified by the Canadian Lumber Standards Accreditation Board.
- .2 Plywood identification: Grade mark in accordance with applicable CSA standards.
- .3 Each board of fire retardant treated material to shall bear the ULC label indicating 'Flame Spread Classification' (FSC), and smoke developed.
- .4 Construction shall be reviewed before covering by other materials. Notify Departmental Representative a week in advance of anticipated completion of an elevation, and make arrangements for a site review. Work is not to proceed that would impair a visual review at completed elevations and roofs until reviewed.

1.05 DELIVERY, STORAGE AND HANDLING

- .1 Deliver, store and handle materials in accordance with Section 01 61 00 - Common Product Requirements and with manufacturer's written instructions.
- .2 Delivery and Acceptance Requirements: deliver materials to site in original factory packaging, labelled with manufacturer's name and address.
- .3 Deliver wood products bundled or crated to provide adequate protection during transit. Inspect wood products for damage upon delivery and remove and replace damaged materials.

- .4 Store materials a minimum of 150 mm off the ground on blocking. Keep materials under cover and dry. Provide for air circulation within and around stacks and under temporary coverings.
- .5 Protect sheet materials to prevent breaking of corners and damage to surfaces.

2 PRODUCTS

2.01 GRADES

- .1 Use CLS grade marked lumber conforming to the Standard Grading Rules for Canadian Lumber published by the National Lumber Grades Authority.

2.02 MATERIALS

- .1 Lumber: FSC Certified, kiln-dried, to CAN/CSA 0141, softwood, S-P-F, S4S, graded and stamped in accordance with National Lumber Grading Association (NLGA) Standard Grading Rules for Canadian Lumber and as follows:
 - .1 Moisture Content: maximum 8% at time of installation.
 - .2 Maximum moisture content when used for attachment of drywall: 8%.
 - .3 Grade: No. 2 or better, and having the following minimum properties:
 - .1 Sizes: 38 mm or 89 mm wide by depth as indicated on drawings.
 - .2 Bending at extreme fibre (F_b): 11.8 MPa.
 - .3 Longitudinal shear (F_v): 1.0 MPa.
 - .4 Compression parallel to grain (F_c): 11.5 MPa.
 - .5 Compression perpendicular to grain (F_{cp}): 4.6 MPa.
 - .6 Tension parallel to grain (F_t): 5.5 MPa.
 - .7 Modulus of elasticity (E/E_{05}): 9500/6500.

- .2 Exterior Sheathing: Fiberglass-Mat Faced Gypsum Sheathing:
ASTM C1177:
 - 1. Thickness: 16mm.
 - 2. Width: 1219mm.
 - 3. Length: 2438mm.
 - 4. Weight: 12 kg/sq. m.
 - 5. Edges: Square.
 - 6. Surfacing: Fiberglass mat on face, back, and long edges.
 - 7. Racking Strength (Ultimate, not design value) (ASTM E72): Not less than 2600 sq/m, dry.
 - 8. Flexural Strength, Parallel (ASTM C473): 120 kg/m, parallel.
 - 9. Humidified Deflection (ASTM C1177): Not more than 2/8 inch.
 - 10. Permeance (ASTM E96): Not less than 23 perms.
 - 11. RSI-Value (ASTM C518): 0.087.
 - 12. Mold Resistance (ASTM D3273): 10, in a test as manufactured.
 - 13. Microbial Resistance (ASTM D6329, UL Environmental GREENGUARD 3-week protocol): Will not support microbial growth.
- .3 Other Panel Materials:
 - .1 Douglas Fir or Pine plywood, complying with CSA O121 or CSA O151 respectively, thickness as indicated, no added urea formaldehyde. Use Exterior Grade materials at all exterior building enclosure locations.

2.04 MISCELLANEOUS LUMBER

- .1 Provide lumber for support or attachment of other construction, including furring, blocking, nailing strips, ground, rough bucks, cants, curbs, fascia, backing sleepers, and similar members.
- .2 Fabricate miscellaneous lumber from dimension lumber of sizes indicated, and into shapes shown on drawings.
- .3 Moisture Content: 19% maximum for lumber items not specified to receive wood preservative treatment.
- .4 Grade: for dimension lumber sizes provide No. 2 or Standard grade lumber per NLGA. For board-sized lumber, provide sheathing grade, S2S.

2.05 ACCESSORIES

- .1 Metal framing connectors and hangers: prefabricated steel products tested or designed in accordance with CSA O86.1 and CSA S16.1. Finish: hot dipped galvanized post-fabrication, all sides, to ASTM A123.
- .2 Sealants: in accordance with Section 07 92 00 - Joint Sealants.
- .3 General purpose adhesive: to CSA O112 Series, moisture-resistant Type I. Maximum allowable VOC limit 70 g/L in accordance with SCAQMD Rule 1168.
- .4 Nails, spikes, and staples: to ASTM F1667, suited to construction application and conditions; double hot dipped at all exterior applications.
- .5 Screws for Fastening to Cold-Formed Metal Framing: ASTM C954, except with wafer heads and reamer wings, length as recommended by screw manufacturer for material being fastened.
- .6 Rough Hardware (bolts, nuts, washers, etc.): hot dip galvanized in conformity to CSA G164 or Grade A low carbon steel, conforming to ASTM A307.
 - .1 Bolts: 13 mm diameter unless indicated otherwise, complete with nuts and washers
- .7 Nailing discs: flat caps, minimum 25 mm diameter, minimum 0.4 mm thick, fibre, formed to prevent dishing. Bell or cup shapes not acceptable.
- .8 Proprietary fasteners: toggle bolts, expansion shields and lag bolts, screws and lead plugs, recommended for purpose by manufacturer.

2.06 CHEMICAL PRESSURE TREATMENTS

- .1 Where lumber or plywood is indicated as preservative treated or is specified to be treated, treated in accordance with CAN/CSA O80.9M.
- .2 Wood preservatives containing arsenic or chromium are not permitted.

- .3 Pressure treat above ground items with waterborne preservatives to minimum retention of 4.0 kg/m³. After treatment, kiln-dry lumber and plywood to maximum moisture content of 19% and 15% respectively. Treat indicated items and the following:
 - .1 Wood cants, nailing strips, curbs, equipment support bases, blocking, stripping, and similar members in connection with roofing, flashing, vapour barriers, and waterproofing.
 - .2 Wood sills, sleepers, blocking, furring, stripping, and similar concealed members in contact with masonry and concrete.
 - .3 Wood framing members less than 460 mm above grade.
 - .4 Wood floor plates installed over concrete slabs directly in contact with earth.
- .4 Pressure treat wood members in contact with ground or freshwater with waterborne preservatives to minimum of 6.4kg/m³.
- .5 Fire-Retardant Treatment: to CAN/SCA O80.9M, CAN/CSA O80.20M and CAN/CSA O80.27M, pressure impregnated, and as follows:
 - .1 Flame Spread Classification: FSC 25 maximum.
 - .2 Smoke developed of not more than: 75.
- .6 Complete fabrication of treated items before treatment where possible. If cut after treatment apply field treatment to cut surfaces.
- .7 Wood Preservatives: Maximum allowable VOC limit 350 g/L in accordance with SCAQMD Rule #1113 - Architectural Coatings.

2.07 FASTENER FINISHES

- .1 All Fastener Finishes, including but not limited to nails, spikes, staples, screws, nailing discs, and proprietary fasteners shall be either double hot dipped galvanized or stainless steel:
 - .1 Galvanizing: to ASTM A653, double hot dipped galvanized for pressure preservative and fire retardant treated materials; hot dipped galvanized for all other purposes.

- .2 Stainless steel: use stainless steel Type 316 alloy for fasteners that penetrate or are in contact with cedar shingles or are in the watershed path of cedar shingle rain runoff.

3 EXECUTION

3.01 EXAMINATION

- .1 Verification of Conditions: verify conditions of substrates previously installed under other Sections or Contracts are acceptable for product installation in accordance with manufacturer's written instructions.
 - .1 Visually inspect substrate in presence of Departmental Representative.
 - .2 Inform Departmental Representative of unacceptable conditions immediately upon discovery.
 - .3 Proceed with installation only after unacceptable conditions have been remedied.

3.02 PREPARATION

- .1 Treat surfaces of material with wood preservative before installation.
- .2 Apply preservative by dipping or by brush to completely saturate and maintain wet film on surface for minimum 3 minute soak on lumber and one minute soak on plywood.
- .3 Re-treat surfaces exposed by cutting, trimming or boring with liberal brush application of preservative before installation.
- .4 Preservative treat material as follows:
 - .1 Wood cants, fascia backing, curbs, nailers, and wood blocking around windows.
- .2 Fire-retardant treat electrical equipment mounting boards and panels and as additionally or otherwise indicated.

3.03 INSTALLATION

- .1 Comply with requirements of National Building Code of Canada (NBC) supplemented by the requirements of this Section. Use dust collectors and high quality respirator masks when cutting or sanding wood panels, and lumber or panels treated with preservative or fire-retardant treated materials.
- .2 Install members true to line, with levels and elevations square and plumb.
- .3 Construct continuous members from pieces of longest practical length.
- .4 Select exposed framing for appearance. Install lumber and panel materials so that grade-marks and other defacing marks are concealed or are removed by sanding where materials are left exposed.
- .5 Install wall sheathing in accordance with manufacturer's printed instructions.
- .6 Install furring and blocking as required to space-out and support other work as required.
- .7 Install furring to support board wall finishes where there is no blocking and where sheathing is not suitable for direct nailing.
 - .1 Align and plumb faces of furring and blocking to tolerance of 1:600.
- .8 Install wood nailers, curbs and other wood supports as required and secure using fasteners with finish as specified in this Section.
- .9 Frame, anchor, fasten, tie and brace members to provide necessary strength and rigidity.
- .10 Countersink bolts where necessary to provide clearance for other work.
- .11 Use nailing disks for soft sheathing as recommended by sheathing manufacturer.

3.04 POWER, TELECOMMUNICATIONS AND DATA PANEL BOARDS

- .1 Install 19 mm fire rated fir plywood boards on all walls in electrical rooms receiving wiring and equipment; minimum 1220 mm x 2440 mm panels on periphery walls over 300 mm wide, mounted 150 mm off of finished floor.
- .2 Paint panels with 2 coats of light coloured fire retardant intumescent paint finish; coat all sides of panels (back, front and sides) to meet the intent of fire rated panel requirements listed in CSA T530 and ANSI/TIA/EIA 569-B requirements.

3.05 CLEANING

- .1 Progress Cleaning: clean in accordance with Section 01 74 11 - Cleaning.
 - .1 Leave Work area clean at end of each day.
- .2 Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment in accordance with Section 01 74 11 - Cleaning.
- .3 Waste Management: separate waste materials for reuse and recycling in accordance with Section 01 74 21 - Construction/Demolition Waste Management and Disposal.
 - .1 Remove recycling containers and bins from site and dispose of materials at appropriate facility.

3.06 PROTECTION

- .1 Protect installed products and components from damage during construction.
- .2 Repair damage to adjacent materials caused by rough carpentry installation.

END OF SECTION

1 GENERAL

1.01 RELATED REQUIREMENTS

- .1 Section 06 10 00 - Rough Carpentry.
- .2 Section 06 40 00 - Architectural Woodwork.
- .3 Section 07 61 00 - Sheet Metal Roofing.

1.02 REFERENCES

- .1 American National Standards Institute (ANSI)
 - .1 ANSI/HPVA HP-1-10, American National Standard for Hardwood and Decorative Plywood.
- .2 Architectural Woodwork Manufacturers Association of Canada (AWMAC) and Architectural Woodwork Institute (AWI)
 - .1 Architectural Woodwork Quality Standards, 2nd edition.
- .3 ASTM International
 - .1 ASTM A123/A123M-15, Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products.
 - .2 ASTM E1333-14, Standard Test Method for Determining Formaldehyde Concentrations in Air and Emissions Rates from Wood Products Using a Large Chamber.
 - .3 ASTM F593-17, Standard Specification for Stainless Steel Bolts, Hex Cap Screws, and Studs.
 - .4 ASTM F594-09(2015) Standard Specification for Stainless Steel Nuts.
 - .3 ASTM F1667-17, Standard Specification for Driven Fasteners: Nails, Spikes, and Staples.
- .5 CSA Group (CSA)
 - .1 CSA O86-14, Engineering Design in Wood.
 - .2 CSA O141-05(R2014), Softwood Lumber.
- .6 Forest Stewardship Council (FSC)
 - .1 FSC-STD-01-001 (Version 4-0), FSC Principles and Criteria for Forest Stewardship.
- .7 National Lumber Grades Authority (NLGA)
 - .1 Standard Grading Rules for Canadian Lumber, January 2014.

- .8 Underwriters Laboratories of Canada (ULC)
 - .1 CAN/ULC S104-15, Standard Method for Fire Tests of Door Assemblies.
 - .2 CAN/ULC S105-16, Standard Specification for Fire Door Frames Meeting the Performance Required by CAN/ULC S104.

1.03 ACTION AND INFORMATION SUBMITTALS

- .1 Submit in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Product Data:
 - .1 Submit two copies of WHMIS MSDS in accordance with Section 01 35 29.06 - Health and Safety Requirements.
- .3 Shop Drawings:
 - .1 Submit shop drawings.
 - .2 Indicate details of construction, profiles, jointing, fastening and other related details.
 - .3 Indicate materials, thicknesses, finishes and hardware.
- .4 Samples:
 - .1 Submit for review and acceptance of each unit.
 - .2 Submit duplicate 300 x 300 mm samples of each type of finished wood as required for initial selections, and confirmation of finishing process and finished appearance.
- .5 Certifications: submit certificates signed by manufacturer certifying materials comply with specified performance characteristics and physical properties.

1.04 QUALITY ASSURANCE

- .1 Lumber by grade stamp of agency certified by Canadian Lumber Standards Accreditation Board (CLSAB).
- .2 Plywood, particleboard, OSB and wood based composite panels to CSA and ANSI standards.
- .3 Wood fire rated frames and panels: listed and labelled by an organization accredited by Standards Council of Canada to CAN/ULC S104 and CAN/ULC S105.

1.05 DELIVERY, STORAGE AND HANDLING

- .1 Deliver, store and handle materials in accordance with Section 01 61 00 - Common Product Requirements and with manufacturer's written instructions.
- .2 Delivery and Acceptance Requirements: deliver materials to site in original factory packaging, labelled with manufacturer's name and address.
- .3 Storage and Handling Requirements:
 - .1 Store materials off ground, in dry location and in accordance with manufacturer's recommendations in clean, dry, well-ventilated area.
 - .2 Store and protect wood products from deterioration, warpage or deformation, and damage.
 - .3 Replace defective or damaged materials with new.

1.06 WARRANTY

- .1 For the work of this Section, the 12 month warranty period prescribed in Subsection GC 32.1 of General Conditions "C" is extended to 24 months.

2 PRODUCTS

2.01 MATERIALS

- .1 Hardwood lumber: Clear White Maple, S4S, average moisture content of 6% and maximum of 9% for interior work, an average moisture content of 12% and maximum of 15% for exterior work, in accordance with following standards:
 - .1 National Hardwood Lumber Association (NHLA), select or better grade; white wood only; for transparent finish.
 - .2 AWMAC premium grade, moisture content as specified.
- .2 Softwood lumber (planks, boards, battens, trim, etc.): Eastern White Pine, Grade No. 1 or better, kiln-dried (KD) and heat treated (HT), S4S (rough sawn where indicated; smooth and sanded if not otherwise indicated), moisture content 16% or less in accordance with following standards:
 - .1 CSA 0141.
 - .3 NLGA Standard Grading Rules for Canadian Lumber.
 - .4 AWMAC premium grade, moisture content as specified.
 - .5 Machine stress-rated lumber is acceptable.

- .6 Sizes: as indicated, and in accordance with reviewed shop drawings.

2.02 ACCESSORIES

- .1 Nails: to ASTM F1667; galvanized to ASTM A123/A123M.
- .2 Fasteners at Roof Deck, to ASTM F1667 and ASTM F593, Type 304 stainless steel, sized as required.
 - .1 Stainless steel splitless ring shanked flooring nails.
 - .2 Stainless steel screws.
- .3 Wood screws, to ASTM F593: galvanized to ASTM A123/A123M, size, type and lengths as required to suit application.
- .4 Splines: wood.
- .5 Joint Sealants: in accordance with Section 07 92 00 - Joint Sealants.

2.03 SITE FABRICATION

- .1 Fabricate items rigid, plumb and square, as detailed, with tight, bevelled, hairline joints. Sand work smooth, set all nails and screws. Countersink bolts and washers, fill holes with matching wood plugs.

2.04 FINISHES

- .1 Opaque Finishes: to Section 09 91 00 - Painting, and as indicated. For paint finishes, confirm finish and colour with Departmental Representative prior to ordering materials and applying finishes.
- .2 Clear Finishes (Maple and Pine): AWMAC Premium Grade, water-based oil-modified polyurethane, amber tone, minimum 3-coat application system.
 - .1 Sand between coats per finish manufacturer's printed directions.

3 EXECUTION

3.01 EXAMINATION

- .1 Verification of Conditions: verify conditions of substrates previously installed under other Sections or Contracts are acceptable for wood products installation in accordance with manufacturer's written instructions.
 - .1 Visually inspect substrate in presence of Departmental Representative.
 - .2 Inform Departmental Representative of unacceptable conditions immediately upon discovery.
 - .3 Proceed with installation only after unacceptable conditions have been remedied. Proceeding with work means acceptance of conditions.

3.02 COMPLIANCE

- .1 Minimum Requirements: work shall meet or exceed requirements of CSA O86 and Part 9 of the National Building Code.

3.03 INSTALLATION

- .1 Discard materials that are warped, twisted, bowed, crooked or otherwise defective.
- .2 Execute finish carpentry work to AWMAC Quality Standards: premium grade. Form joints to conceal shrinkage.
- .3 Scribe and cut as required, fit to abutting walls, and surfaces, fit properly into recesses and to accommodate piping, columns, fixtures, outlets, or other projecting, intersecting or penetrating objects.

3.04 CONSTRUCTION

- .1 Fastening:
 - .1 Position items of finished carpentry work accurately, level, plumb, true and fasten or anchor securely.
 - .2 Design and select fasteners to suit size and nature of components being joined. Use proprietary devices as recommended by manufacturer.

- .3 Set finishing nails to receive filler. Where screws are used to secure members, countersink screw in round smooth cut hole and plug with wood plug to match material being secured.
- .4 Replace items of finish carpentry with damage to wood surfaces including hammer and other bruises.
- .4 Standing and running trim:
 - .1 Butt and cope internal joints of baseboards to make snug, tight, joint. Cut right angle joints of casing and base with mitred joints.
 - .2 Fit backs of baseboards and casing snugly to wall surfaces to eliminate cracks at junction of base and casing with walls.
 - .3 Make joints in baseboard, where necessary using a 45 degrees scarf type joint.
 - .4 Install door and window trim in single lengths without splicing.
- .5 Frames:
 - .1 Set frames square and secure, with plumb sides and level heads and sills.

END OF SECTION