

## **1 GENERAL**

### **1.01 RELATED REQUIREMENTS**

- .1 Section 05 50 00 - Metal Fabrications.
- .2 Section 06 17 53 - Prefabricated Wood Trusses.
- .3 Section 06 18 00 - Glue Laminated Construction.
- .4 Section 06 20 00 - Finish Carpentry.
- .5 Section 06 40 00 - Architectural Woodwork.
- .6 Section 07 31 29 - Wood Shingles and Shakes.
- .7 Section 07 42 29 - Ceramic Walls Panels.
- .8 Section 07 42 43 - Composite Wall Panels.
- .9 Section 07 52 00 - Modified Bituminous Membrane Roofing.
- .10 Section 07 62 00 - Sheet Metal Flashing and Trim.
- .11 Section 07 61 00 - Sheet Metal Roofing.
- .12 Section 08 35 16 - Side Folding Grilles.
- .13 Section 09 21 16 - Gypsum Board Assemblies.
- .13 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 Canada Green Building Council (CaGBC)
  - .1 LEED® Canada 2009 Rating System, LEED® Canada for New Construction and Major Renovations.
- .4 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.
- .5 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 Prince Edward Island.

- .6 Forest Stewardship Council (FSC)
  - .1 FSC-STD-01-001 (Version 4-0), FSC Principles and Criteria for Forest Stewardship
- .7 National Research Council Canada (NRC)
  - .1 National Building Code of Canada (NBC), edition adopted and currently enforced by the Province of Prince Edward Island.
- .8 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.
- .9 The Truss Plate Institute of Canada
  - .1 TPIC 2014, Truss Design Procedures and Specifications for Light Metal Plate Connected Wood Trusses.
- .10 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.
- .3 LEED Submittals: Submit in accordance with Section 01 35 21 - LEED Requirements:
  - .1 Regional Materials: submit evidence that project incorporates required percentage 30% of regional materials and products, showing their cost, distance from project to furthest site of extraction or manufacture, and total cost of materials for project,
  - .2 Submit LEED submittal forms for Credit MR 7 - Certified Wood. Indicate the following:

- .1 Wood based materials and products have been certified in accordance with the Forest Stewardship Council's (FSC) Principles and Criteria. Provide chain-of-custody certificates for wood based products.
- .3 Submit LEED submittal form for Credit EQ 4.1 - Low Emitting Materials, Adhesives and Sealants. Indicate the following:
  - .1 Sealants: Documentation identifying that VOC content is less than the VOC limits of State of California's South Coast Air Quality Management District (SCAQMD) Rule #1168.
  - .2 Adhesives: Documentation identifying that VOC content is less than the VOC limits of State of California's South Coast Air Quality Management District (SCAQMD) Rule #1168.
- .4 Submit LEED submittal forms for Credits EQ 4.2 - Low Emitting Materials, Paints and Coatings. Indicate the following:
  - .1 Documentation identifying that VOC content for wood preservatives is less than the VOC limits of State of California's South Coast Air Quality Management District (SCAQMD) Rule #1113.
- .5 Submit LEED submittal forms for Credit EQ 4.4 - Low-Emitting Materials, Composite Wood and Agrifibre Products. Indicate the following:
  - .1 Composite wood and agrifibre products used on the interior must not contain added urea-formaldehyde resins. Laminating adhesives used to fabricate on-site and shop-applied composite wood and agrifibre assemblies must not contain added urea-formaldehyde resins.

#### **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:
  - .1 Douglas Fir (DFP) or Pine Plywood: FSC Certified, Exterior Grade, no added urea formaldehyde, complying with CSA 0121 or CSA 0151 respectively, thickness as indicated on drawings.
- .3 Other Panel Materials:
  - .1 Douglas Fir or Pine plywood, complying with CSA 0121 or CSA 0151 respectively, FSC Certified, thickness as indicated, no added urea formaldehyde. Use Exterior Grade materials at all exterior building enclosure locations (i.e., roof and walls).

## 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 086.1 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 0112 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 Joist hangers: minimum 1 mm thick sheet steel, galvanized ZF001 coating designation.
- .8 Nailing discs: flat caps, minimum 25 mm diameter, minimum 0.4 mm thick, fibre, formed to prevent dishing. Bell or cup shapes not acceptable.
- .9 Proprietary fasteners: toggle bolts, expansion shields and lag bolts, screws and lead plugs, recommended for purpose by manufacturer.
- .10 Subflooring Adhesive: moisture-resistant Type I.
- .11 Roof sheathing H-Clips: formed "H" shape, thickness to suit panel material, extruded 6063-T6 aluminum alloy or hot dipped galvanized steel.

- .12 Acceptable wood sheathing auxiliary subfloor fasteners:
  - .1 Flat head #8 wood screws, Robertson square drive, straight roots, 5/8 inch (16 mm) long, sufficient to penetrate through 3/8-inch (9.5 mm) thick top layer of sheathing into bottom layer of sheathing approximately 1/4-inch (6 mm), countersunk flush with surface (but no deeper); ensure screws do not penetrate through bottom layer of sheathing into acoustic underlayment.
- .13 Sill Gaskets: rubberized, moisture-resistant, 3 mm thick closed cell neoprene strip, or 8 mm thick open cellular rubber reinforced with solid rubber particles bonded to cellulose, full width of sill plate (separating all horizontal board members from direct contact with concrete), with self-sticking permanent adhesive on one face, lengths as required.

## **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/m<sup>3</sup>. 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/m<sup>3</sup>.



- .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 sleepers on roof deck.
  - .2 Wood sleepers supporting wood subflooring over concrete slabs in contact with ground or fill.
- .5 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 Install Sill Gaskets, full width of wood member, at all concrete-to-wood interfaces to prevent direct contact between wood and concrete.
- .4 Construct continuous members from pieces of longest practical length.
- .5 Install spanning members with crown-edge up.
- .6 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.

- .7 Install subflooring and combined subfloor and underlay with panel end-joints located on solid bearing, staggered at least 800 mm.
  - .1 In addition to mechanical fasteners, secure floor subflooring to floor joists using glue and screws. Place continuous adhesive bead in accordance with manufacturer's instructions, single-bead on each joist and double-bead on joists where panel ends butt.
  - .2 Allow for a 1/32 inch gap between subflooring panels when installing wood board flooring to accommodate swelling with increased moisture content.
  - .3 Install subflooring with the strength axis perpendicular to the flooring joists.
  - .4 Do not use sealer or drywall compound to fill cracks and dents in the subfloor.
  - .5 Ensure that the subflooring panels are flat. Sand any joints that have raised edges because of edge swell.
  - .6 Use a moisture-vapour retarder between the subflooring and the finish wood flooring to prevent moisture from leaching through the joists and subfloor to negatively affect the finish wood floor above.
- .7 Install wall sheathing in accordance with manufacturer's printed instructions.
- .8 Install roof sheathing in accordance with requirements of National Building Code of Canada (NBC).
- .9 Install blocking at locations indicated to support washroom accessories and sliding door hardware.
- .10 Install furring and blocking as required to space-out and support other work as required.
- .11 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.
- .12 Install wood cants, fascia backing, nailers, curbs and other wood supports as required and secure using fasteners with finish as specified in this Section.
- .13 Frame, anchor, fasten, tie and brace members to provide necessary strength and rigidity.

- .14 Countersink bolts where necessary to provide clearance for other work.
- .15 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 and Section 01 35 21 - LEED Requirements.
  - .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 WORK INCLUDED**

- .1 This Section specifies requirements for design, supply, transporting and erecting nail-laminated timber (NLT) roof decking in pre-fabricated panels where shown on the Drawings and as specified herein.

### **1.02 RELATED WORK**

- .1 Section 06 10 00 - Rough carpentry:
- .2 Section 06 18 00 - Glue Laminated Construction
- .3 Section 06 17 53 - Pre-Fabricated Wood Trusses
- .4 Section 01 35 21 - LEED Requirements

### **1.03 REFERENCES**

- .1 ALSC, American Lumber Standard Committee Board of Review
- .2 ALSC DOC PS20-15, American Softwood Lumber Standard
- .3 APA, The Engineered Wood Association
- .4 ASTM A153/A153M-16a, Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware.
- .5 ASTM E1333-14, Standard Test Method for Determining Formaldehyde Concentrations in Air and Emission Rates from Wood Products Using a Large Chamber
- .6 ASTM F1667-15, Standard Specification for Driven Fasteners: Nails, Spikes and Staples
- .7 ICC-ES ESR-1539, Power-Driven Staples and Nails
- .8 NDS 2015 National Design Specification for Wood Construction
- .9 2010 National Building Code of Canada
- .10 CAN/CSA O80 Series-15, Wood Preservation.
- .11 CSA-O86-14, Engineering Design in Wood.
- .12 CAN/CSA-O141-05 (R2014), Softwood Lumber.
- .13 CSA W47.1-09(R2014), Certification of Companies for Fusion

Welding of Steel Structures.

- .14 CAN/CSA-Z809-08, Sustainable Forest Management
- .15 FSC-STD-01-001-V52-2-2015, FSC Principle and Criteria for Forest Stewardship
- .16 NLGA, Standard Grading Rules for Canadian Lumber, 2014.
- .17 Canada Green Building Council (CaGBC):
  - .1 LEED (Leadership in Energy and Environmental Design) Green Building Rating System for New Construction and Major Renovations: LEED Canada-NC - Version 4, 2013.

**1.04 ACTION AND INFORMATIONAL SUBMITTALS**

- .1 Submit in accordance with Section 01 33 00 - Submittal Procedures
- .2 Product Data: For each type of factory-fabricated product. Submit proposed sealer for review and approval.
- .3 Shop drawings:
  - .1 Connections and details, joint patterns, material specification and finishes including an erection layout, stamped and signed by professional engineer registered or licensed in the Province of Prince Edward Island, Canada.
  - .2 Submit erection drawings in accordance with CSA 086.
  - .3 Shop drawings for members: indicate stress grade, service grade and appearance grades, shop applied finishes, camber, cuts, ledgers, holes and connection details
- .4 Provide a letter outlining steps to be taken during construction to ensure adequate weather protection of wood structures.
- .5 Sustainable Design Submittals:
  - .1 LEED Canada submittals: in accordance with Section 01 35 21 - LEED Requirements.
  - .2 Construction Waste Management:
    - .1 Submit project Waste Management Plan highlighting recycling and salvage requirements.
    - .2 Submit calculations on end-of-project recycling rates, salvage rates, and landfill rates demonstrating 75% of construction wastes recycled or salvaged.
  - .3 Recycled Content:
    - .1 Submit listing of recycled content products used, including details of required percentages or recycled content materials and products, showing their costs

and percentages of post-consumer and post-industrial content, and total cost of materials for project.

- .4 Regional Materials: submit evidence project incorporates required percentage 20% of regional materials and products, showing their cost, distance from project to furthest site of extraction or manufacture, and total cost of materials for project.
- .5 Wood Certification: submit vendor's Chain-of-Custody Certificate number for CAN/CSA-Z809 or FSC or SFI certified wood.
- .6 Low-Emitting Materials:
  - .1 Submit listing of adhesives and sealants and paints and coatings used in building, showing compliance with VOC and chemical component limits or restrictions requirements.
- .6 Samples:
  - .7 Submit for review and acceptance of each finish.
  - .8 Samples returned for inclusion into work.
  - .9 Submit one (1) sample of connector plates.
- .7 In lieu of grade stamping lumber exposed to view, submit manufacturer's certificate certifying that products meet or exceed specified requirements.
- .8 The fabricator and erector shall submit a QA/QC log of items such as, but not limited to:
  - .1 Environmental conditions at all stages, such as during fabrication, storage, transportation, erection and ideally until building is completely finished.
  - .2 Actual length, thickness and width of the NLT panels. Length, width, thickness and diagonal measurement are to be noted on the top surface of the panels.
  - .3 Site deliveries, including verified load manifests with notes of damaged or missing materials and elements.
  - .4 Material and element install with sign off for QC on hardware/fastener installation.
  - .5 Equipment used, such as but not limited to torque drills (with torque clutch) for screw installation through steel plates, etc.
  - .6 Any changes or modifications.

The inclusion of representative pictures within the log is required.

#### **1.05 QUALITY ASSURANCE**

- .1 Perform work in accordance with NDS and the following agencies:

- .1 Lumber Grading Agency: Certified by ALSC and NGLA
- .2 Plywood Grading Agency: Certified by APA and NGLA
- .2 Build mockups to demonstrate aesthetic effects and set quality standards for materials and execution.
  - .1 Build one complete NLT panel with a minimum width of 1200mm.
  - .2 Mockup must illustrate typical wood appearance, coating and finish.
  - .3 Keep mockup available to view as the standard of work for remaining fabrication.
  - .4 Approved mockups may become part of the completed work if undisturbed at the time of substantial completion.
- .3 Build NLT panels in a shop environment for quality control. Shop fit panels during fabrication. Review with Departmental Representative prior to proceeding further.

#### **1.06 DELIVERY, STORAGE AND HANDLING**

- .1 Store all materials and assembled NLT panels under cover with proper drainage. Take particular care to protect exposed end grain. Protect from staining and damage at all times during fabrication, transportation and installation.
- .2 Take all necessary precautions to keep NLT dry during and after installation, including temporary sloping tarps and UV protection.

#### **1.07 LEED DOCUMENTATION**

- .1 Submit a LEED Material Submittal form as included in Section 01 35 21 - LEED Requirements, to identify recycled and/or regional content of materials for inclusion by the Departmental Representative in a submission for LEED certification.
- .2 Submit product data for Indoor Environmental Quality EQ-4.4 Low Emitting Materials: Composite Wood and Laminates Adhesives. Submit product data and documentation for composite wood and agri-fibre products certifying all wood products and laminating adhesives contain no added urea-formaldehyde resins in accordance with ASTM E1333.
- .3 Submit product data sheets or MSDS sheets indicating the VOC content of interior site-applied adhesives, sealants, paints and/or coatings. Refer to emission limits stated in Section 01 35 21 - LEED Requirements.
- .4 Provide Forestry Stewardship Council Chain of Custody certificates for wood materials in compliance with LEED Credit MR



7. To meet LEED requirements for LEED MRc7, the cost of all wood products, FSC certified or not, must be provided. Each vendor invoice must contain:
- .1 Each product must be identified on a line by line basis.
  - .2 FSC products must be identified as such on a line by line basis.
  - .3 The dollar value of each item must be shown.
  - .4 The vendors COC certificate number must be shown on any invoice that includes FSC products.
- .5 Submit product data sheets or MSDS sheets indicating the VOC content of sealants, paints and/or coatings. Refer to emission limits stated in Section 01 35 21 - LEED Requirements.
- .6 All wood products used without required documentation will be rejected.

## **2 PRODUCTS**

### **2.01 SUSTAINABLE REQUIREMENTS**

- .1 Materials and products in accordance with Section 01 35 21 - LEED Requirements.

### **2.02 MATERIALS**

- .1 Lumber: SPF species, No. 1 grade, softwood, S4S, with maximum moisture content of 19% at time of fabrication and to following standards:
- .1 CAN/CSA-O141.
  - .2 NLGA (National Lumber Grading Association), Standard Grading Rules for Canadian Lumber.
- .2 Connectors:
- .1 Provide fasteners of size and type indicated that comply with requirements specified in this article for material and manufacture. Provide fasteners with hot-dip zinc coating complying with ASTM A153 or of Type 304 stainless steel.
  - .2 In accordance with CSA-O86.
  - .3 Nails, Brad and Staples: ASTM F1667.
- .3 Miscellaneous Materials:
- .1 Moisture Barrier: as indicated on the design drawings.
  - .2 Wood Sealer: As specified in Section 09 91 00. Sealer shall be compatible with indicated finish. End sealer shall be effective in retarding the transmission of moisture at cross-grain cuts.

## **2.03 FABRICATION**

- .1 Prefabrication: Hand select members to ensure straightness and architectural-quality appearance.
  - .1 No wane, knot holes, grade stamps or stains are permitted to be visible in the completed structure.
- .2 Place soffits of timbers so the least number of checks and knots will be visible in the completed structure.
- .3 Arrange laminations in aligned joint pattern. Place laminations with joints centered over support members below. No joints are to be visible from below.
- .4 Use common steel wire nails unless otherwise noted. Make tight connections between members. Install fasteners without splitting wood. Drive nails snug but do not countersink nail heads unless noted otherwise.
- .5 Clearly mark top surface of NLT panels for identification during erection.
- .6 Apply a saturation coat of end sealer to ends and other cross-cut surfaces, keeping surfaces flood coated for not less than 10 minutes.
- .7 After end-coat sealing, apply a heavy saturation coat of penetrating sealer on surfaces of each NLT panel or seal every lam prior to assembly.

## **2.04 FABRICATION TOLERANCES**

- .1 Soffit elevation of individual laminations: plus or minus 0.8mm.
- .2 Panel width: plus or minus 6mm.
- .3 Panel length: plus or minus 3mm.
- .4 For rectangular panels, the corner to corner diagonal measurements should not deviate from each other by more than 3mm.

## **3 EXECUTION**

### **3.01 EXAMINATION**

- .1 Confirm all dimensions prior to fabrication. Coordinate with shop drawings of other trades.
- .2 Examine supporting construction in areas to receive NLT, with Installer present, for compliance with requirements, installation

tolerances and other conditions affecting performance of the work.

- .3 Proceed with installation only after unsatisfactory conditions have been corrected.

### **3.02 ERECTION**

- .1 Provide temporary shores, guys, braces and other supports during erection to keep NLT secure and in alignment against wind loads, seismic loads, temporary construction s and loads equal in intensity to design loads. Any failure to make proper and adequate provisions for stresses during erection will be solely the responsibility of the installer. Fasteners required for erection purposes are the responsibility of the Contractor and are to be included in the bid.
- .2 Fit NLT panels closely and accurately to required levels and lines without trimming, cutting or other modifications, unless approved in writing by the Department Representative.
- .3 Securely attach NLT to supports as per reviewed shop drawings.
- .4 Site cutting or boring of NLT, other than shown on the shop drawings, is not permitted without written consent of the Departmental Representative. Coat all field-cut openings with minimum two coats of clear sealer.
- .5 Provide sill gaskets below lamination and non-rigid vapor barrier sealant between laminations where assembly passes over exterior walls.
- .6 Provide gaps as required for construction tolerances and swelling. Details and locations shall be indicated on the shop drawings and reviewed with the Departmental Representative prior to construction. Gaps on the interior of the building are to be filled after the building is fully enclosed and temperature controlled.

### **3.03 REPAIRS AND FINISHING**

- .1 Prior to finishing, remove any stains, marks or other damage that may have occurred during construction.
- .2 Provide field finish of NLT as specified in Section 09 91 00.
- .3 Final approval by Departmental Representative will be after installation of all NLT. Remove and replace all work that does not conform to the standard of the approved mockup, at Departmental Representative request. Replacement of defective

work is at the Contractor's expense.

### **3.04 ERECTION TOLERANCE**

- .1 For rectangular areas, the corner-to-corner diagonal measurements should not deviate from each other by more than 12mm or 0.25% of the length of the shortest side of the rectangle, whichever is greater.
- .2 Overall surface levelness: 6mm in 3 meter maximum.
- .3 Elevation: plus or minus 10mm from theoretical.
- .4 Joints: 5mm maximum gap between NLT panels or individual laminations unless noted otherwise.

**END OF SECTION**

## **1 GENERAL**

### **1.01 WORK INCLUDED**

- .1 This Section specifies requirements for design, supply, transporting and erecting pre-fabricated wood roof trusses, braces and bridging where shown on the Drawings and as specified herein.

### **1.02 RELATED WORK**

- .1 Section 06 10 00 - Rough carpentry:
- .2 Section 01 35 21 - LEED Requirements

### **1.03 REFERENCES**

- .1 CSA-086-14, Engineering Design in Wood.
- .2 CAN/CSA-O141-05 (R2014), Softwood Lumber.
- .3 CSA W47.1-09(R2014), Certification of Companies for Fusion Welding of Steel Structures.
- .4 ASTM E1333-14, Standard Test Method for Determining Formaldehyde Concentrations in Air and Emission Rates from Wood Products Using a Large Chamber.
- .5 NLGA, Standard Grading Rules for Canadian Lumber, 2014.
- .6 Canada Green Building Council (CaGBC):
  - .1 LEED (Leadership in Energy and Environmental Design) Green Building Rating System for New Construction and Major Renovations: LEED Canada-NC - Version 4, 2013.

### **1.04 DESIGN CRITERIA**

- .1 Design trusses, bracing and bridging in accordance with CSA-086 and NBC 2010, Part 4 requirements, normal building designation. Internal wind uplift pressures will be determined in accordance with NBC 2010, Part 4 requirements, Category 3 building designation.
- .2 Dead load and snow loads are indicated on the design drawings. Design trusses for point loads from suspended mechanical/electrical equipment as noted on plans.
- .3 Limit combined live load and dead load deflections to 1/240th of span unless otherwise specified or indicated. Limit live load

deflection to 1/360th of span unless otherwise specified or indicated.

- .4 Design and supply all truss uplift anchors (truss tie downs), in accordance with CSA-O86, to withstand the wind uplift loads shown on Drawings.
- .5 At truss bearing points, where allowable compression perpendicular to the grain is exceeded, the truss manufacturer must provide bearing plates.

#### **1.05 SOURCE QUALITY CONTROL**

- .1 Identify lumber by grade stamp of an agency certified by Canadian Lumber Standards Administration Board.

#### **1.06 QUALIFICATION OF MANUFACTURERS**

- .1 Fabricator for welded steel connections to be certified in accordance with CSA W47.1.

#### **1.07 SHOP DRAWINGS**

- .1 Submit shop drawings and erection drawings in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Each shop drawing submission showing connection details must bear signature and stamp of professional engineer registered or licensed in Prince Edward Island.
- .3 Indicate species, sizes, and stress grades of all lumber used as structural members. Show pitch, span, camber, design heel height, configuration and spacing of members. Indicate connector types, thicknesses, sizes, locations and design value. Show bearing details. Indicate design load for each member.
- .4 Submit stress diagram or print-out of computer design indicating design load for each member. Indicate allowable load and stress increase.
- .5 Indicate arrangement of webs or other members to accommodate ducts and other specialties.
- .6 Show lifting points for storage, handling and erection.
- .7 Show location of lateral bracing for compression members.

#### **1.08 LEED DOCUMENTATION**

- .1 Submit a LEED Material Submittal form as included in Section 01 35 21 - LEED Requirements, to identify recycled and/or regional

content of materials for inclusion by the Departmental Representative in a submission for LEED certification.

- .2 Submit product data for Indoor Environmental Quality EQ-4.4 Low Emitting Materials: Composite Wood and Laminates Adhesives. Submit product data and documentation for composite wood and agri-fibre products certifying all wood products and laminating adhesives contain no added urea-formaldehyde resins in accordance with ASTM E1333.
- .3 Submit product data sheets or MSDS sheets indicating the VOC content of interior site-applied adhesives, sealants, paints and/or coatings. Refer to emission limits stated in Section 01 35 21 - LEED Requirements.
- .4 Provide Forestry Stewardship Council Chain of Custody certificates for wood materials in compliance with LEED Credit MR 7. To meet LEED requirements for LEED MRc7, the cost of all wood products, FSC certified or not, must be provided. Each vendor invoice must contain:
  - .1 Each product must be identified on a line by line basis.
  - .2 FSC products must be identified as such on a line by line basis.
  - .3 The dollar value of each item must be shown.
  - .4 The vendors COC certificate number must be shown on any invoice that includes FSC products.
- .5 Submit product data sheets or MSDS sheets indicating the VOC content of sealants, paints and/or coatings. Refer to emission limits stated in Section 01 35 21 - LEED Requirements.
- .6 All wood products used without required documentation will be rejected.

#### **1.09 DELIVERY AND STORAGE**

- .1 Store members on job site in accordance with manufacturer's instructions. Provide bearing supports and bracings. Prevent bending, warping and overturning of members.

## **2 PRODUCTS**

### **2.01 SUSTAINABLE REQUIREMENTS**

- .1 Materials and products in accordance with Section 01 35 21 - LEED Requirements.

### **2.02 MATERIALS**

- .1 Lumber: SPF species, No. 1 grade, softwood, S4S, with maximum

moisture content of 19% at time of fabrication and to following standards:

- .1 CAN/CSA-O141.
- .2 NLGA (National Lumber Grading Association), Standard Grading Rules for Canadian Lumber.
- .2 Fastenings: to CSA-086.
- .3 Tie-down anchors: prefabricated wood truss to top plate uplift anchors, galvanized, to resist uplift force calculated as per the National Building Code of Canada and indicated on the design drawings.

## **2.03 FABRICATION**

- .1 Fabricate wood trusses in accordance with reviewed shop drawings.
- .2 Provide for design camber and roof slopes when positioning truss members.
- .3 Connect members using metal connector plates.

## **3 EXECUTION**

### **3.01 ERECTION**

- .1 Erect wood trusses in accordance with reviewed erection drawings.
- .2 Indicated lifting points to be used to hoist trusses into position.
- .3 Make adequate provisions for handling and erection stresses.
- .4 Exercise care to prevent out-of-plane bending of trusses.
- .5 Install temporary horizontal and cross bracing to hold trusses plumb and in safe condition until permanent bracing and decking are installed.
- .6 Install permanent bracing in accordance with reviewed shop drawings, prior to application of loads to trusses.
- .7 Do not cut or remove any truss material without approval of the Departmental Representative.
- .8 Provide galvanized uplift anchor(s), at each truss bearing point, to resist uplift force, calculated as per National Building Code of Canada and indicated on the design drawings.
- .9 Have all truss tie downs (uplift anchors), designed, supplied and



installed by the truss supplier.

**END OF SECTION**

## **1 GENERAL**

### **1.01 RELATED REQUIREMENTS**

- .1 Section 01 35 21 - LEED Requirements
- .2 Section 03 20 00 - Concrete Reinforcement
- .3 Section 03 30 00 - Cast-in-Place Concrete

### **1.02 REFERENCE STANDARDS**

- .1 ASTM International
  - .1 ASTM A 36/A 36M-14, Standard Specification for Carbon Structural Steel.
  - .2 ASTM A 47/A 47M-99(2014), Standard Specification for Ferritic Malleable Iron Castings.
  - .3 ASTM A 123/A 123M-15, Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products.
  - .4 ASTM A 307-14, Standard Specification for Carbon Steel Bolts and Studs, 60,000 PSI Tensile Strength.
  - .5 ASTM A 653/A 653M-15e1, Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
- .2 Canada Green Building Council (CaGBC)
  - .1 LEEDv4 Canada-BD+C 2013, LEED (Leadership in Energy and Environmental Design): Green Building Rating System Reference Package New Construction and Major Renovation.
  - .2 LEEDv4 Canada-BD+C 2013, LEED (Leadership in Energy and Environmental Design): Green Building Rating System Reference Package Core and Shell Development.
  - .3 LEEDv4 Canada-ID+C 2013, LEED (Leadership in Energy and Environmental Design): Green Building Rating System Reference Guide For Commercial Interiors.
  - .4 LEEDv4 Canada fO+M 2013, LEED (Leadership In Energy and Environmental Design): Green Building Rating System Reference Guide Existing Buildings, Operations and Maintenance.
- .3 CSA Group
  - .1 CSA G40.20-13/G40.21-13, General Requirements for Rolled or Welded Structural Quality Steel/Structural Quality Steel.
  - .2 CAN/CSA O80 Series-15, Wood Preservation.
  - .3 CSA O86 Consolidation-14, Engineering Design in Wood.

- .4 CSA O112.10-08(R2013), Evaluation of Adhesives for Structural Wood Products (Limited Moisture Exposure).
- .5 CAN/CSA-O122-16, Structural Glued-Laminated Timber.
- .6 CSA O177-06(R2015), Qualification Code for Manufacturer's of Structural Glued-Laminated Timber.
- .7 CSA S16-14, Design of Steel Structures.
- .8 CSA W47.1-09(2014), Certification of Companies for Fusion Welding of Steel Structures.
- .9 CAN/CSA-Z809-08, Sustainable Forest Management.
- .4 Forest Stewardship Council (FSC)
  - .1 FSC-STD-01-001-V52-2-2015, FSC Principle and Criteria for Forest Stewardship.
- .5 Green Seal Environmental Standards (GS)
  - .1 GS-11-11, Paints and Coatings.
- .6 National Lumber Grading Authority (NLGA)
  - .1 NLGA 2014 Standard Grading Rules for Canadian Lumber
- .7 Society of Automotive Engineers International (SAE)
  - .1 SAE Handbook 2009.
- .8 South Coast Air Quality Management District (SCAQMD), California State, Regulation XI. Source Specific Standards
  - .1 SCAQMD Rule 1113-A2016, Architectural Coatings.
  - .2 SCAQMD Rule 1168-A2005, Adhesives and Sealants Applications.
- .9 Sustainable Forestry Initiative (SFI)
  - .1 SFI-2010-2014 Standard.
- .10 The Master Painters Institute (MPI)
  - .1 Architectural Painting Specification Manual - current edition.

### **1.03 ACTION AND INFORMATIONAL 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 glued-laminated construction

- and include product characteristics, performance criteria, physical size, finish and limitations.
- .2 Submit WHMIS MSDS in accordance with Section 01 33 00.
- .3 Shop Drawings:
  - .1 Submit drawings stamped and signed by professional engineer registered or licensed in the Province of Prince Edward Island, Canada.
  - .2 Submit erection drawings in accordance with CSA S16 and CSA O86.
  - .3 Shop drawings for members: indicate stress grade, service grade and appearance grades, shop applied finishes, camber, cuts, ledgers, holes and connection details.
- .4 Samples:
  - .1 Submit for review and acceptance of each finish.
  - .2 Samples returned for inclusion into work.
  - .3 Submit one (1) sample of connector plates.
- .5 Certifications: submit certificates signed by manufacturer certifying materials comply with specified performance characteristics and physical properties.
  - .1 Submit manufacturer's plant certification to CSA O177, Appendix B at completion of fabrication.
- .6 Test and Evaluation Reports: submit certified test reports for beam, columns and braces from approved independent testing laboratories, indicating compliance with specifications for specified performance characteristics and physical properties.
- .7 Manufacturer's Instructions: submit manufacturer's installation instructions and special handling criteria, installation sequence, cleaning procedures.
- .8 Manufacturers Reports:
  - .1 Manufacturer's Field Reports: submit manufacturer's written reports within three (3) days of review, verifying compliance of Work, as described in Part 3 - FIELD QUALITY CONTROL.
- .9 Sustainable Design Submittals:
  - .1 LEED Canada submittals: in accordance with Section 01 35 21 - LEED Requirements.
  - .2 Construction Waste Management:
    - .1 Submit project Waste Management Plan highlighting recycling and salvage requirements.

- .2 Submit calculations on end-of-project recycling rates, salvage rates, and landfill rates demonstrating 75% of construction wastes recycled or salvaged.
- .3 Recycled Content:
  - .1 Submit listing of recycled content products used, including details of required percentages or recycled content materials and products, showing their costs and percentages of post-consumer and post-industrial content, and total cost of materials for project.
- .4 Regional Materials: submit evidence project incorporates required percentage 20% of regional materials and products, showing their cost, distance from project to furthest site of extraction or manufacture, and total cost of materials for project.
- .5 Wood Certification: submit vendor's Chain-of-Custody Certificate number for CAN/CSA-Z809 or FSC or SFI certified wood.
- .6 Low-Emitting Materials:
  - .1 Submit listing of adhesives and sealants and paints and coatings used in building, showing compliance with VOC and chemical component limits or restrictions requirements.
  - .2 Submit listing of glue-laminated products used in building, stating they contain no added urea-formaldehyde resins, and laminate adhesives used in building, stating they contain no urea-formaldehyde.

#### 1.04 QUALITY ASSURANCE

- .1 Qualifications:
  - .1 Manufacture structural glued-laminated members in plant certified by CSA as meeting requirements of CSA 0177, class X.
  - .2 Submit certificate in accordance with CSA 0177, Appendix B at completion of fabrication.
  - .3 Fabricator for welded steel connections certified to CSA W47.1.
  - .4 Place authorization labels on glued-laminated members indicating manufactured in CSA certified plant.
  - .5 Certification of material protective sealer.

#### 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:
  - .1 Deliver materials to site in original factory packaging, labelled with manufacturer's name and address.
  - .2 Apply protective sealer to glued-laminated units before shipping unless specified otherwise.
  - .3 Wrap commercial grade members prior to leaving plant with moisture resistant wrapping.
  - .4 Use padded, non-marring slings for handling glued-laminated members.
  - .5 Protect corners with wood blocking.
  - .6 Make adequate provision for delivery and handling stresses.
- .3 Storage and Handling Requirements:
  - .1 Store materials indoors, in a dry location and in accordance with manufacturer's recommendations in clean, dry, well-ventilated area.
  - .2 Slit underside of membrane covering during storage at site without defacing member.
  - .3 Store glued-laminated units and protect from weather, block off ground and separate with stripping, so air may circulate around faces of members.
  - .4 Store and protect glue-laminated products from nicks, scratches, and blemishes.
  - .5 Replace defective or damaged materials with new.
- .4 Develop Construction Waste Management Plan related to Work of this Section and in accordance with Section 01 35 21 - LEED Requirements.
- .5 Packaging Waste Management: remove for reuse by manufacturer of pallets, crates, padding, and packaging materials as specified in Construction Waste Management Plan in accordance with Section 01 74 21 - Construction/Demolition Waste Management and Disposal and Section 01 35 21 - LEED Requirements.
  - .1 Dispose of preservative treated wood by means other than for recycling or reuse.
  - .2 Dispose of treated wood, end pieces, wood scraps and sawdust at sanitary landfill approved by the Departmental Representative.
  - .3 Dispose of unused wood preservative material at official hazardous material collections site approved by the Departmental Representative.
  - .4 Divert unused wood materials from landfill to recycling facility approved by the Departmental Representative.

## 2.01 MATERIALS

- .1 Laminating stock:
  - .1 Spruce-Pine-Fir to CAN/CSA-0122 and NLGA Standard Grading Rules for Canadian Lumber.
  - .2 Materials and Resources Credit 5 - Regional Materials: 30% Extracted, harvested, recovered and processed regionally.
  - .3 CAN/CSA-Z809 or FSC or SFI certified.
- .2 Laminating Adhesive:
  - .1 To CSA 0112.10, to grade of service required in accordance with CAN/CSA-0122.
  - .2 Urea-formaldehyde free.
  - .3 VOC limit: 50 g/L maximum to SCAQMD Rule 1168.
- .3 Sealer for glued-laminated members: penetrating type, clear, non-yellowing liquid.
  - .1 VOC limit 275 g/L maximum to [SCAQMD Rule 1113].
- .4 Fastenings:
  - .1 Split ring connections: hot rolled carbon steel, SAE 1010, in accordance with SAE handbook.
  - .2 Shear plate connections:
    - .1 Pressed steel type: hot rolled carbon steel, SAE 1010, in accordance with SAE handbook.
    - .2 Malleable iron type: to ASTM A 47/A 47M, grade [350].
  - .3 Lag screws: to ASME B18.2.1.
  - .4 Bolts: to ASTM A 307.
  - .5 Side plates: to CSA G40.20/G40.21.
  - .6 Drift pins: to ASTM A 307.
  - .7 Glued-laminated rivets: to CSA G40.20/G40.21.
  - .8 Nails and spikes: to CSA B111.
  - .9 Truss plates: light gauge galvanized sheet steel to ASTM A 653, grade A, yield point 255 MPa.
- .5 Shop coat primer for steel connections: to MPI #18.
- .6 Galvanizing: to ASTM A 123/A 123M, hot dipped, minimum zinc coating of 610 g/m<sup>2</sup>.

## 2.02 FABRICATION

- .1 Fabricate members to following classifications:
  - .1 Stress grade: to CSA O86, 24f-ES/NPG (beams, columns and ties) 20f-ES/C PG (decking).
  - .2 Service grade: interior.

- .3 Appearance grade: architectural.
- .2 Mark laminated members for identification during erection. [Marks not visible in final assembly.]
- .3 Design connections to CSA O86, and CSA S16 unless specifically detailed, to resist shears, moments and forces indicated.
  - .1 Fabricate in accordance with CSA S16.
- .4 Paint connections after fabrication.
  - .1 Anti-corrosive paint: VOC limit 250 g/L maximum to GS-11.

### **2.03 APPEARANCE GRADE**

- .1 Structural glued-laminated timber architectural grade.

### **2.04 FACTORY FINISHING**

- .1 Applying sealer to areas to receive stained finish or preservative treatment is prohibited.
- .2 Apply two (2) coats of sealer to end grain and one coat to remainder of members.
- .3 Prepare steel connection surfaces to applicable requirements of Section 05 50 00.
- .4 Prime paint connection steel after fabrication

## **3 EXECUTION**

### **3.01 EXAMINATION**

- .1 Verification of Conditions: verify conditions of substrates previously installed under other Sections or Contracts acceptable for glue-laminated material 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 and after receipt of written approval to proceed from Departmental Representative.



### 3.02 ERECTION

- .1 Protect protective sealer from damage before erection.
  - .1 Touch up damaged areas on site with specified sealer.
- .2 Erect glued-laminated members as indicated and in accordance with reviewed erection drawings.
- .3 Brace and anchor members until permanently secured by structure.
- .4 Make adequate provisions for erection stresses.
- .5 Splice and join only at locations as indicated on reviewed erection drawings.
- .6 Field cutting or altering members without Departmental Representative's approval is prohibited. If approved, preservative treat cut ends.

### 3.03 FIELD QUALITY CONTROL

- .1 Manufacturer's Field Services:
  - .1 Obtain written report from manufacturer verifying compliance of Work, in handling, installing, protecting and cleaning of product..
  - .2 Submit manufacturer's field services consisting of product use recommendations and periodic site visits for inspection of product installation in accordance with manufacturer's instructions.
  - .3 Ensure manufacturer's representative present before and during critical periods of installation construction of field joints and testing.
  - .4 Schedule site visits:
    - .1 After delivery and storage of products, and when preparatory Work, or other Work, on which Work of this Section depends, complete but before installation begins.
    - .2 Twice during progress of Work at 25% and 60% complete.
    - .3 Upon completion of Work, after cleaning carried out.

### 3.04 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 and 01 35 21 - LEED Requirements.
  - .1 Remove recycling containers and bins from site and dispose of materials at appropriate facility.

### **3.05 PROTECTION**

- .1 Protect installed products and components from damage during construction.
- .2 Repair damage to adjacent materials caused by glue laminated construction 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 52 00 - Modified Bituminous Membrane Roofing.
- .4 Section 07 61 00 - Sheet Metal Roofing.
- .5 Section 08 14 16 - Flush Wood Doors.
- .6 Section 08 35 16 - Side Folding Grilles.

### **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, 2<sup>nd</sup> 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.
- .4 Canada Green Building Council (CaGBC)
  - .1 LEED® Canada 2009 Rating System, LEED® Canada for New Construction and Major Renovations.

- .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.

- .6 LEED Submittals: Submit in accordance with Section 01 35 21 - LEED Requirements:
  - .1 Submit LEED submittal forms for Credit MR 7 - Certified Wood in accordance with Section 01 35 21 - LEED Requirements. Indicate the following:
    - .1 Wood based materials and products have been certified in accordance with the Forest Stewardship Council's (FSC) Principles and Criteria. Provide chain-of-custody certificates for wood based products.
  - .2 Submit LEED submittal form for Credit EQ 4.1 - Low Emitting Materials, Adhesives and Sealants in accordance with Section 01 35 21 - LEED Requirements. Indicate the following:
    - .1 Regional Materials: submit evidence that project incorporates required percentage 30% of regional materials and products, showing their cost, distance from project to furthest site of extraction or manufacture, and total cost of materials for project.
    - .2 Sealants: Documentation identifying that VOC content is less than the VOC limits of State of California's South Coast Air Quality Management District (SCAQMD) Rule #1168.
    - .3 Adhesives: Documentation identifying that VOC content is less than the VOC limits of State of California's South Coast Air Quality Management District (SCAQMD) Rule #1168.
  - .3 Submit LEED submittal forms for Credits EQ 4.2 - Low Emitting Materials, Paints and Coatings in accordance with Section 01 35 21 - LEED Requirements. Indicate the following:
    - .1 Documentation identifying that VOC content for wood preservatives is less than the VOC limits of State of California's South Coast Air Quality Management District (SCAQMD) Rule #1113.
  - .4 Submit LEED submittal forms for Credit EQ 4.4 - Low-Emitting Materials, Composite Wood and Agrifibre Products in accordance with Section 01 35 21 - LEED Requirements. Indicate the following:
    - .1 Composite wood and agrifibre products used on the interior must not contain added urea-formaldehyde resins. Laminating adhesives used to fabricate on-site and shop-applied composite wood and agrifibre assemblies must not contain added urea-formaldehyde resins.

#### **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 O141.
  - .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.
- .3 Roof Deck - Nail Laminated Timber (NLT): 38 mm x 89 mm  
dimensional softwood lumber stacked on edge and fastened  
together to form panels with plywood sheathing added on top  
to provide structural diaphragm; refer to structural  
specifications and 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 086 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**

## **1 GENERAL**

### **1.01 RELATED REQUIREMENTS**

- .1 Section 05 50 00 - Metal Fabrications.
- .2 Section 06 10 00 - Rough Carpentry.
- .3 Section 06 20 00 - Finish Carpentry.
- .4 Section 09 21 16 - Gypsum Board Assemblies.
- .5 Section 09 91 00 - Painting.

### **1.02 REFERENCES**

- .1 American National Standards Institute (ANSI)
  - .1 ANSI/ASME 18.6.1-81(R2012) Wood Screws (Inch Series).
  - .2 ANSI/BHMA A156.9-2010, Cabinet Hardware.
  - .3 ANSI/BHMA A156.11-2014, Cabinet Locks.
  - .4 ANSI/BHMA A156.16-2013, Auxiliary Hardware.
  - .5 ANSI/BHMA A156.18-2012, Materials and Finishes.
  - .6 ANSI/BHMA A156.20-2006, Strap and Tee Hinges and Hasps.
  - .7 ANSI A208.1-09, Particleboard.
  - .8 ANSI A208.2-09, Medium Density Fiberboard (MDF) for Interior Applications.
  - .9 ANSI/HPVA HP-1-10, Standard for Hardwood and Decorative Plywood.
- .2 Architectural Woodwork Manufacturers Association of Canada (AWMAC)
  - .1 Architectural Woodwork Standards (AWMAC AWS), 2014.
- .3 ASTM International
  - .1 ASTM A123/A123M-15, Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products.
  - .2 ASTM A153/A153M-16, Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware.
  - .3 ASTM E1333-10, Standard Test Method for Determining Formaldehyde Concentrations in Air and Emission Rates From Wood Products Using a Large Chamber.
  - .4 ASTM D2832-92(R2011), Standard Guide for Determining Volatile and Nonvolatile Content of Paint and Related Coatings.

- .5 ASTM D5116-10, Standard Guide For Small-Scale Environmental Chamber Determinations of Organic Emissions From Indoor Materials/Products.
- .6 ASTM F1667-15, Standard Specification for Driven Fasteners: Nails, Spikes, and Staples.
- .4 Canada Green Building Council (CaGBC)
  - .1 LEED® Canada 2009 Rating System, LEED® Canada for New Construction and Major Renovations.
- .5 CSA Group (CSA)
  - .1 CAN/CSA G164-M92(R2003), Hot Dip Galvanizing of Irregularly Shaped Articles
  - .2 CAN/CSA O80 Series-15, Wood Preservation.
  - .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 O325-07(R2012), Construction Sheathing, Includes Update No. 1 (2008).
  - .8 CAN/CSA Z809-08, Sustainable Forest Management.
- .6 Forest Stewardship Council (FSC)
  - .1 FSC-STD-01-001(Version 4-0), FSC Principles and Criteria for Forest Stewardship.
- .7 Green Seal Environmental Standards (GS)
  - .1 GS-11-2015, Paints, Coatings, Stains and Sealers.
  - .2 GS-36-2013, Adhesives for Commercial Use.
- .8 Health Canada/Workplace Hazardous Materials Information System (WHMIS)
  - .1 Material Safety Data Sheets (MSDS).
- .9 National Electrical Manufacturers Association (NEMA)
  - .1 ANSI/NEMA LD-3-[05], High-Pressure Decorative Laminates (HPDL).
- .10 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.
- .11 Sustainable Forestry Initiative (SFI)
  - .1 SFI-2015-2019 Standard and Rules.

### **1.03 PRE-INSTALLATION MEETING**

- .1 Prior to enclosing framing, convene a meeting of contractor, casework fabricator, casework installer, framing subcontractor [and Consultant].
  - .1 Review locations of backing required for casework installation as shown on shop drawings and as necessary for installation.
  - .2 Review method of attachment for backing to wall system.
  - .3 Review coordination with other affected sections.

### **1.04 ACTION AND INFORMATION SUBMITTALS**

- .1 Submit in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Product Data:
  - .1 Prepare and submit material list in accordance with AWMAC AWS, cross-referenced to specifications.
  - .2 Include manufacturer's instructions, printed product literature, data sheets and catalogue pages for all materials and products to be incorporated into architectural wood casework and include product characteristics, performance criteria, dimensions and profiles, finish and limitations on use.
  - .3 Submit two copies of WHMIS MSDS in accordance with Section 01 35 29.06 - Health and Safety Requirements.
- .3 Hardware List:
  - .1 Submit hardware list cross-referenced to specifications.
  - .2 Include manufacturer's specification sheets indicating name, model, material, function, finish, BHMA designations and other pertinent information.
- .4 Shop Drawings:
  - .1 Prepare and submit shop drawings in accordance with AWMAC AWS and as follows.
  - .2 Submit two sets of shop drawings for initial review in accordance with requirements of Division 01. Revise as directed, submit six copies for final acceptance and distribution.
  - .3 Indicate details of construction, profiles, jointing, fastening and other related details.
    - .1 Scales: profiles full size, details half full size.

- .4 Indicate materials, thicknesses, finishes and hardware.
  - .5 Indicate locations of service outlets in casework, typical and special installation conditions, and connections, attachments, anchorage and location of exposed fastenings.
  - .6 Show location on casework elevations of backing required in supporting structure for attachment of casework.
  - .7 Indicate AWMAC AWS quality grade where different from predominant grade specified.
  - .8 Include color schedule of all casework items, including all countertop, exposed, and semi-exposed cabinet finishes, finish material manufacturer, pattern, and color.
- .5 Samples:
- .1 Prepare and submit samples in accordance with AWMAC AWS and as follows.
  - .2 Apply sample finishes to specified substrate or core material minimum 300 x 300 mm. For veneers with transparent finish submit three samples to illustrate range and colour of grain expected.
  - .3 Shop applied coatings:
    - .1 For transparent finish, submit triplicate samples of each species and cut of wood to be used, finished as specified.
    - .2 For opaque finish, submit triplicate samples for each colour selection, finished as specified.
  - .4 Submit duplicate samples of laminated plastic for each specified colour selection.
  - .5 Submit duplicate samples of laminated plastic joints, edging, cutouts and post-formed profiles.
  - .6 Furnish four samples of each lumber and composite panel material to Contractor for preparation of field applied finish samples in accordance with Section 09 91 00 - Painting.
  - .7 Certifications: submit certificates signed by manufacturer certifying that materials comply with specified performance characteristics and physical properties.
  - .8 Submit statement of experience and qualifications of architectural wood casework fabricator.

### **1.05 SUSTAINABLE DESIGN SUBMITTALS**

- .1 Submit in accordance with Section 01 35 21 - LEED Requirements for following characteristics:
  - .1 Recycled Content, Regional Materials, and Low-Emitting Materials.
- .2 Submit vendor's and manufacturer's Chain-of-Custody Certificate number for FSC certified wood.
  - .1 Submit vendor's and manufacturer's FSC Chain-of-Custody Certificate number.
- .3 Submit ASTM E1333 test report for formaldehyde emissions from composite wood products showing compliance with specified limits.
- .4 Submit product data indicating compliance with other specified sustainable design characteristics.
- .5 Regional Materials: submit evidence that project incorporates required percentage 30% of regional materials and products, showing their cost, distance from project to furthest site of extraction or manufacture, and total cost of materials for project.

### **1.06 QUALITY ASSURANCE**

- .1 Perform Work of this Section by single architectural wood casework fabricator with minimum 5 years of current architectural casework production experience and having completed minimum one project in the past 5 years with value within 20% of the cost of the work of this Section.
- .2 Mock-ups:
  - .1 Construct mock-ups in accordance with Section 01 45 00 - Quality Control.
  - .2 Shop prepare one base cabinet unit, one wall cabinet, and one counter top, complete with hardware and shop applied finishes, and install where directed by Departmental Representative.
  - .3 Allow 24 hours for inspection of mock-up by Departmental Representative before proceeding with Work.

- .4 When accepted, mock-up will demonstrate minimum standard for Work.
- .5 Do not proceed with work prior to receipt of written acceptance of mock-up by Departmental Representative.
- .6 Accepted mock-up may remain as part of finished work.

#### **1.07 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 Deliver wood casework only when area of work is enclosed, plaster and concrete work is dry, and area is broom clean and site environmental conditions are acceptable for installation.
- .3 Protect millwork against dampness and damage during and after delivery.
- .4 Store millwork in ventilated areas, protected from extreme changes of temperature and humidity, and within range recommended by AWMAC AWS for location of project.
- .5 Store materials indoors in dry location in clean, dry, well-ventilated area.
- .6 Protect architectural woodwork and hardware from nicks, scratches, and blemishes.
- .7 Replace defective or damaged materials with new.

#### **1.08 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 SUSTAINABILITY CHARACTERISTICS**

- .1 Lumber, plywood and composite wood products to be FSC or certified.
- .2 Composite wood products: contain no added formaldehyde, with formaldehyde emissions within the following limits when tested in accordance with ASTM E1333.

- .1 Hardwood plywood with veneer core (HWPW-VC): 0.05 ppm.
- .2 Hardwood plywood with composite core (HWPW-CC): 0.05 ppm.
- .3 Particleboard (PB): 0.09 ppm.
- .4 Medium density fibreboard (MDF): 0.11 ppm.
- .5 Thin (less than 8 mm) medium density fibreboard (tMDF): 0.13 ppm.
- .3 Recycled content:
  - .1 Composite wood products: in accordance with Section 01 35 21 - LEED Requirements.
  - .2 Fibreboard must contain less than 10% roundwood by weight, using weighted average over three month period at manufacturing locations.
- .4 Adhesives: VOC limit to SCAQMD Rule 1168 and GS-36.
- .5 Coatings:
  - .1 Clear Wood Finishes: VOC limit to GS-11 and SCAQMD Rule 1113.
  - .2 Paints: VOC limit to GS-11 and SCAQMD Rule 1113.

## **2.02 QUALITY GRADE**

- .1 Provide all materials and perform all fabrication in accordance with AWMAC AWS Custom Grade and as follows, except where specified otherwise:
  - .1 Economy Grade: mechanical rooms and utility areas.
  - .2 Premium Grade: where specifically specified.
- .2 In case of conflict between Contract Documents and AWMAC AWS grade requirements, Contract Documents govern.

## **2.03 MATERIALS**

- .1 Softwood and Hardwood Lumber: Sound lumber to specified AWMAC AWS quality grade requirements, kiln-dried to moisture content recommended by AWMAC AWS for location of the Work.
- .2 Particleboard: to ANSI A208.1, Grade M-3, minimum 750 kg/m<sup>3</sup> particleboard for countertops and shelves; having no added urea formaldehyde; clearly mark panels with grade mark in visible location; extruded particleboard having loose cores with voids will not be permitted.
  - .1 Use moisture resistant grade 2-M-3 for countertops and splash-backs to receive plumbing fixtures.



- .3 MDF (medium density fibreboard) core: to ANSI A208.2, density 769 kg/m<sup>3</sup>, Custom Grade, 19 mm thick unless indicated otherwise
  - .1 Use moisture resistant MR grade for countertops and splash-backs to receive plumbing fixtures.
- .4 Douglas fir plywood (DFP): to CSA 0121, standard construction.
- .5 Canadian softwood plywood (CSP): to CSA 0151, standard construction.
- .6 Poplar plywood (PP): to CSA 0153, standard construction.
- .7 Hardboard: To CAN/CGSB-11.3.
- .8 High-Pressure Decorative Laminate: to ANSI/NEMA LD3; Grades and application in accordance with applicable AWS requirements and as follows:
  - .1 Constructed of multiple layers of phenolic resin-saturated kraft paper in combination with a layer of decorative melamine-saturated paper, all fused together under heat and pressure.
  - .2 Horizontal General Purpose Grade (HGS): thickness of 1.2 mm ±0.12 mm, used on the following:
    - .1 Horizontal surfaces, unless specified otherwise.
  - .3 Vertical General Purpose Grade (VGS): thickness of 0.7 mm ±0.10 mm, used on the following:
    - .1 Vertical surfaces, unless specified otherwise.
    - .2 Exposed portions of case bodies, including ends, divisions and bottoms.
    - .3 Exposed shelves.
    - .4 Casework Doors: exposed and semi-exposed surfaces.
    - .5 Drawer Faces: exposed and semi-exposed surfaces.
  - .4 Laminate backer grade (BKL): thickness of 0.5 mm ±0.10 mm, used on the following:
    - .1 Concealed surface of casework backs.
    - .2 Concealed surfaces, unless specified otherwise.
  - .5 Colours: as selected by Departmental Representative from manufacturer's full range.
- .9 Low Pressure Laminate: decorative thermosetting laminate moulded and cured at pressures in general of 2.8 x 10<sup>6</sup> pascals, to ANSI/NEMA LD3, in accordance with applicable AWS requirements, and as follows:
  - .1 Thickness: 0.5 mm minimum.

- .2 Wear Resistance: 400 cycles minimum.
- .3 Colour: colour as selected by Departmental Representative from manufacturer's full range.
- .10 Nails and staples: to ASTM F1667; galvanized to ASTM A123/A123M for humid areas and for treated lumber; plain finish elsewhere.
- .11 Wood screws: brass, type and size to suit application.
- .12 Screws and bolt caps to cover heads of fasteners used to secure work to walls - pop on screw covers for 6 mm diameter screws - fabricator's choice, as approved by Departmental Representative.
- .13 Sealants: in accordance with Section 07 92 00 - Joint Sealants.
- .14 Edging:
  - .1 High Pressure Decorative Laminate Edging (e.g., at countertops, window sills, and as indicated):
    - .1 Horizontal General Purpose Grade (HGS): thickness of 1.2 mm  $\pm$  0.12 mm, colour and finish to match surface finish.
    - .2 Post-forming (VGP): maximum thickness of 1 mm, colour and finish to match surface finish.
- .15 Adhesives, use commercial grade, brush-applied adhesives only:
- .16 Decorative laminate: polyvinyl acetate or aliphatic resin in accordance with manufacturer's recommendation for curing under pressure for bonding to wood cores, water resistant type.

## 2.04 CASEWORK FABRICATION - GENERAL

- .1 Fabricate to AWMAC custom quality grade.
- .2 Countertops:
  - .1 Post-formed countertops and backsplashes of plastic laminate 0.039" on 19 mm particleboard, with backer sheet on reverse side, no added urea formaldehyde.
  - .2 Nosing to be 180 degrees, "Ultra" bullnose.
  - .3 Top of backsplash to be 90 degrees.
  - .4 Trim corners of countertops where required so adjacent cabinet doors, when fully open, do not contact the corner of the countertop.

- .5 Adhesives used to fabricate laminated assemblies containing these products must contain no added urea formaldehyde.
- .3 Set nails and countersink screws apply plain wood filler to indentations, sand smooth and leave ready to receive finish.
- .4 Provide cutouts for plumbing fixtures, inserts, appliances, outlet boxes and other fixtures.
- .5 Shop assemble work for delivery to site in size easily handled and to ensure passage through building openings.
- .6 Obtain governing dimensions before fabricating items which are to accommodate or abut appliances, equipment and other materials.
- .7 Ensure adjacent parts of continuous laminate work match in colour and pattern.
- .8 Veneer laminated plastic to core material in accordance with adhesive manufacturer's instructions. Ensure core and laminate profiles coincide to provide continuous support and bond over entire surface. Use continuous lengths up to 2400 mm. Keep joints 600 mm from sink cutouts.
- .9 Form shaped profiles and bends as indicated, using postforming grade laminate to laminate manufacturer's instructions.
- .10 At laminate edges, chamfer exposed edges uniformly at approximately 20 degrees. Do not mitre laminate edges.
- .11 Apply laminate backing sheet to reverse side of core of plastic laminate work.

## **2.05 LAMINATED PLASTIC CASEWORK FABRICATION**

- .1 Do laminated plastic fabrication in compliance with NEMA LD3, Annex A and specified AWMAC AWS quality grade.
- .2 Ensure adjacent parts of continuous laminate work match in colour and pattern.

- .3 Veneer laminated plastic to core material in accordance with adhesive manufacturer's instructions. Ensure core and laminate profiles coincide to provide continuous support and bond over entire surface. Use continuous lengths up to 2400 mm. Keep joints 600 mm from sink cutouts.
- .4 Form shaped profiles and bends as indicated, using post-forming grade laminate to laminate manufacturer's instructions.
- .5 Use straight self-edging laminate strip for flatwork to cover exposed edge of core material. Chamfer exposed edges uniformly at approximately 20 degrees. Do not mitre laminate edges.
- .6 Apply laminate backing sheet to reverse side of core of plastic laminate work.
- .7 Apply laminated plastic liner sheet to interior of cabinetry.

## **2.06 SHOP APPLIED FINISH COATINGS**

- .1 Finish system: AWMAC AWS Custom grade.
- .2 Apply finish system component materials in accordance with manufacturer's instructions.
- .3 Paint finishes: in accordance with Section 09 91 00 - Painting.
- .4 Confirm finish requirements with Departmental Representative prior to ordering materials.

## **2.07 CABINET HARDWARE**

- .1 Casework hardware: to ANSI/BHMA A156.9, Grade 2 or better. Hardware shall include all fasteners, mounting hardware, and accessories as required for complete installations. Refer to MILLWORK HARDWARE legend on Contract Drawings.
  - .1 European hinges, self-closing with integrated soft-closing function, 100 degrees opening: steel, screw-on mounting, nickel plated.
  - .2 Cam and drawer locks: die-cast zinc, nickel finish.
  - .3 Pulls: stainless steel, 8/104x25mm, approximate 90 degree corners with square profile (eased at returns).

- .4 Heavy-duty drawer slides: full extension, 182 kg load rating, rated for frequent use, 25 mm over travel, non-disconnect, self-closing, touch release, polymer ball bearings, zinc finish.
- .5 Closet rods (coat rod): 28 mm outside diameter x 2.8 mm thick chrome tube complete with closed end chrome flanges.
- .6 Adjustable shelves: stainless steel pin rests, 7 mm Ø socket collar inserts for steel pin shelf supports, drill holes in cabinet work to accept collar, nickel finish.
- .7 Waste/Recycle Containers: premanufactured plastic bins, sizes as indicated
- .8 Door mutes: 6 mm clear plastic.
- .9 Other items as indicated.
- .2 Keying: Keyed as directed by Departmental Representative.
  - .1 Provide 3 keys per lock.
  - .2 Provide 25 master keys.
  - .3 Stamp keying code numbers on keys and cylinders.

### 3 EXECUTION

#### 3.01 EXAMINATION

- .1 Verification of Conditions: verify conditions of substrates previously installed under other Sections or Contracts are acceptable for architectural woodwork installation in accordance with manufacturer's 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 [and after receipt of written approval to proceed from Departmental Representative.

#### 3.02 INSTALLATION

- .1 Install architectural wood casework in accordance with AWMAC AWS grade for respective items.
- .2 In case of conflict between Contract Documents and AWMAC AWS grade requirements, Contract Documents govern.

- .3 Install prefinished millwork at locations shown on drawings.
  - .1 Position accurately, level, plumb straight.
- .4 Fasten and anchor millwork securely.
  - .1 Supply and install heavy duty fixture attachments for wall mounted cabinets.
- .5 Countersink mechanical fasteners at exposed and semi-exposed surfaces, excluding installation attachment screws and screws securing cabinets end to end.
- .6 Use draw bolts in countertop joints.
- .7 Scribe and cut as required to fit abutting walls and to fit properly into recesses and to accommodate piping, columns, fixtures, outlets or other projecting, intersecting or penetrating objects.
- .8 At junction of plastic laminate counter back splash and adjacent wall finish, apply small bead of sealant in accordance with Section 07 92 00 - Joint Sealants.
- .9 Apply moisture barrier between wood framing members and masonry or cementitious construction.
- .10 Fit hardware accurately and securely in accordance with manufacturer's written instructions.
- .11 Make cutouts for inset equipment and fixtures using templates provided.

### **3.03 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.
  - .1 Clean millwork and cabinet work, inside cupboards and drawers, and outside surfaces.
  - .2 Remove excess glue, pencil and ink marks from surfaces.

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- .3 Waste Management: separate waste materials for reuse and recycling in accordance with Section 01 74 21 - Construction/Demolition Waste Management and Disposal and Section 01 35 21 - LEED Requirements.

### **3.04 PROTECTION**

- .1 Protect millwork and cabinet work from damage until final inspection.
- .2 Protect installed products and components from damage during construction.
- .3 Repair damage to adjacent materials caused by architectural woodwork installation.
- .4 Leave work to be site finished ready for finishing by Section 09 91 00.

**END OF SECTION**