

1 General

1.1 **SECTION INCLUDES**

- .1 Labour, Products, equipment and services necessary for rough carpentry work in accordance with the Contract Documents.
- .2 Refer to Structural drawing and specifications for load bearing elements.

1.2 **REFERENCES**

- .1 ASTM A153, Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware.
- .2 ASTM A325, Specification for Bolts Quenched/Tempered Steel Nominal Thread Diameter M16 - M36 For Structural Steel Joints.
- .3 ASTM A653, Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
- .4 ASTM E84, Standard Test Method for Surface Burning Characteristics of Building Materials.
- .5 CAN/CSA G164-M, Hot Dip Galvanizing of Irregularly Shaped Articles.
- .6 CAN/CSA O80 Series M, Wood Preservation.
- .7 CAN/CSA O86, Engineering Design in Wood (Limit States Design)
- .8 CSA O121-M, Douglas Fir Plywood.
- .9 CAN/CSA O141, Softwood Lumber.
- .10 CAN/CGSB-51.32-M, Sheathing, Membrane, Breather Type.
- .11 CAN/ULC-S102, Standard Method of Test for Surface Burning Characteristics of Building Materials and Assemblies.
- .12 CWC, Canadian Wood Council, Wood Reference Book.
- .13 NLGA, Standard Grading Rules for Canadian Lumber, National Lumber Grades Authority

1.3 **DESIGN REQUIREMENTS**

- .1 Design structural lumber in accordance with the OBC and CAN/CSA O86 to withstand live, dead, lateral, wind, seismic, handling, transportation, and erection loads.

- .2 Design structural lumber in accordance with climatic design data for North York contained in Ontario Building Code.
- .3 Design stair(s) to carry a minimum uniform live load of 488 kg/m ° of projected plan area.
- .4 Design stair(s) to carry a minimum concentrated load of 1465 kg/m * applied at the centre of any tread span.
- ~~.5 Construction is required to include off-site Modular and/or panelization construction, as per the CMHC RHI Modular construction definition and as included in the drawings. As per CMHC RHI definition, Modular is defined as: housing units that are partially or fully built in off-site (e.g. a factory, warehouse, or similar facility) by a qualified manufacturer and delivered to the site in whole or in parts and installed on an appropriately zoned and serviced lot. This may range between single, scattered units up to larger multi-unit housing projects.~~

1.4 SUBMITTALS

- .1 Product data:
 - .1 Submit duplicate copies of manufacturer's Product data for structural lumber in accordance with Section 01 33 00 indicating:
 - .1 Performance criteria, compliance with appropriate reference standard(s), characteristics, and limitations.
 - .2 Product transportation, storage, handling and installation requirements.
 - .2 Shop drawings:
 - .1 Submit shop drawings in accordance with Section 01 33 00 indicating:
 - .1 Plans, elevations, sections, details, materials, grades, dimensions, lumber nominal and actual sizes, gauges, finishes connections, and relationship to adjacent construction.
 - .2 Complete engineering design data confirming that Products meet design criteria specified.
 - .3 Samples: Submit samples of the following in accordance with the requirements of Section 01 33 00:
 - .1 Two representative pieces of each type of exposed pressure treated lumber finished as specified.
 - .4 Reports and Certificates:
 - .1 Submit certification from an independent inspection company that manufacturer meet the requirements of CSA 0177.
 - .2 Submit written inspection and test report results five working days after each inspection.

1.5 **QUALITY ASSURANCE**

- .1 Retain a Professional Engineer, licensed in Province of Ontario, with experience in work of comparable complexity and scope, to perform following services as part of work of this Section:
 - .1 Design of structural lumber.
 - .2 Review, stamp, and sign fabrication and erection shop drawings, design calculations.
 - .3 Professional Engineer to include confirmation in a conspicuous location in the shop drawings and design calculations that "The proposed Work will conform to the 2024 Ontario Building Code (OBC, Ontario Regulation 163/24, as amended by 247/25), applicable CSA and ASTM standards and any other applicable standards and regulations related to the work".
 - .4 Conduct shop and on-site inspections, prepare and submit written inspection reports verifying that this part of Work is in accordance with Contract Documents and reviewed shop drawings.
 - .5 Refer to Section 01 78 00 regarding submission requirements for the subject licensed Professional Engineer as it relates to sign-off letter.
- .2 Lumber identification: Grade stamp of an agency certified by the Canadian Lumber Standards Accreditation Board.
- .3 Plywood identification: Grade mark in accordance with applicable CSA standards.
- .4 Lumber quality: Carefully select individual pieces so that knots and obvious defects will not interfere with placing bolts, proper nailing or making proper connections.
- .5 Moisture Content of wood at time of construction shall be 19% maximum.
- .6 Each piece of pressure treated lumber and fire retardant treated lumber shall be shop marked with the pressure treatment brand and ULC monogram respectively, In accordance with CAN/CSA 080-M.
- .7 Dimensions of lumber shall conform to dressed sizes specified in CAN/CSA-0141 unless actual dimensions are otherwise indicted or specified.
- .8 Dimensional references to lumber on Drawings and in Specifications are to nominal sizes unless actual dimensions are indicated. Such actual dimensions shall be dry size.
- .9 Lumber defects: Discard wood with defects which will render a piece unable to serve its intended function. Lumber will be rejected by Consultant for excessive warp, twist, bow, crook, mildew, fungus, or mould, as well as for improper cutting and fitting, whether or not it has been installed.

1.6 **ENVIRONMENTAL REQUIREMENTS**

1. When it is required that wood maintain dimensional stability and tolerances to ensure accurate installation of later work, store and install it only in dry areas, and where no further installation of moist materials is contemplated.

1.7 **PRODUCT DELIVERY, STORAGE AND HANDLING**

- .1 Store materials in a dry area. Cover materials with tarpaulins or polyethylene sheets to prevent moisture absorption and impairment of structural and aesthetic properties. Vent to allow air movement. Tie covering to keep in place.

2 Products

2.1 **MATERIALS**

.1 General:

- .1 Materials used for work of this Section are to be in accordance with the following criteria, but not limited to:
 - .1 Regionally sourced materials.
 - .2 Certified wood.
 - .3 VOC content limits.
- .2 Adhesives - Urea-formaldehyde-free glues.
- .3 All dimensional lumber and plywood to be FSC certified.
- .4 All composite wood and/or agrifibre products (including core materials) and adhesives used to fabricate laminated assemblies used in building must not contain added urea-formaldehyde.
- .5 Material to be sourced regionally from within 800 km of jobsite wherever possible.

.2 Lumber: Softwood, G4S, moisture content 19% or less at time of installation, in accordance with the following:

- .1 Lumber shall be of same species and grade, equally seasoned and shall be processed and stamped at same mill.
- .2 CSA O141 and NLGA Standard Grading Rules for Canadian Lumber.
- .3 Board quality: Construction or better.
- .4 Dimension quality:
 - .1 Structural joists, planks, and framing: No. 1 Select Structural.
 - .2 Light framing: Construction.
- .5 Beams and stringers: Standard.

.3 Pressure treated wood: No.2 or Better Grade treatable species (Pine or Fir) free of checks, holes, loose knots, pitch, shakes, splits, wane and warp, or as allowed by sample acceptable to the Consultant, vacuum/pressure impregnated with copper based preservative in accordance with CAN/CSA-080 to a net retention of 650 kg./m3, unless otherwise specified by preservative manufacturer.

- .4 Plywood (interior grade **IP-1** and exterior grade **EP-1**): CSA O121-M, G1S unsanded, T & G, standard construction, laminated with waterproof adhesive, exterior grade where indicated in drawings, Thickness as indicated on drawings.
- .5 Oriented Strand Board (**OSB**): To CSA O325, Mat Formed Panels, structural rated, T & G edge profile, laminated with waterproof phenolic adhesive, exterior grade, thickness as indicated on drawings.
- .6 Sheathing: In accordance with Structural Drawings and Specifications.
- .6 Roof lumber: NLGA, Construction grade light framing, Jack Pine, S4S, pressure treated to CAN/CSA-O80 series using copper based waterborne preservative treatment, impregnated to a net retention of 4 kg/ m^d of preservative unless otherwise specified by preservative manufacturer.
- .7 Surface applied wood preservative: Green coloured copper naphthenate or 5% pentachlorophenol solution, water repellant preservative or same copperbased preservative as used for shop impregnation, in accordance with CAN/CSA 080.
- .8 Fire retardant treatment of lumber and plywood (interior and protected locations): 'Dricon FRT' fire retardant treatment by Biewer Lumber or approved alternative, conforming to ASTM E84, to provide a flame spread rating of 25 or less.
- .9 Rough hardware: Nails, bolts, screws, anchors, expansion shields, and other fastenings required to frame and fix rough carpentry as follows:
 - .1 Nails, spikes and staples: Spiral type.
 - .2 Bolts: ASTM A325; 12.7 mm diameter minimum with nuts and washers unless noted otherwise.
 - .3 Screws: Countersunk head, full thread type.
 - .4 Proprietary fasteners: Toggle bolts, expansion shields, lag bolts, screws, inorganic fibre plugs, recommended for purpose by manufacturer.
 - .5 Galvanize rough hardware used in fire treated wood and hardware exposed to the atmosphere in accordance with CAN/CSA G164-M.
- .10 Fasteners for use in pressure treated wood: Provide hot dipped galvanized fasteners complying to ASTM A153 and connectors in accordance with ASTM A653, Class G185 for non-structural members. Provide type 304 or 316 stainless steel fasteners and connectors for use in Structural, pressure treated wood.
- .11 Sill plate isolation pads: 5 mm thick rubber isolation gasket in width to match wood stud depth, with rubber washer for mechanical fastening to floor or ceiling structure; Iso-Sill by AcoustiGuard or approved alternative.
- .12 Resilient pads: 8 mm thick square neoprene pads with waffle texture, in size and capacity as indicated on reviewed shop drawings; 'W Neoprene Waffle Pad' by Mason Industries Inc. or approved alternative.

- .13 Resilient grommets: Bolt isolator and seismic relief grommets formed from bridge-bearing neoprene, sizes as indicated on reviewed shop drawings; 'HG Washer Bushing' by Mason Industries Inc or approved alternative.

3 Execution

3.1 **EXAMINATION**

- .1 Verify condition and dimensions of previously installed Work upon which this Section depends. Report defects to Consultant. Commencement of work of this Section means acceptance of existing conditions.

3.2 **GENERAL**

- .1 Lay out work carefully and to accommodate work of others. Cut and fit accurately: erect in position indicated by Drawings.
- .2 Install rough carpentry to allow for expansion and contraction of the materials.
- .3 Cut work into lengths as long as practicable and with square ends. Align, level, square, plumb, and secure work permanently in place. Brace work temporarily as required. Join work only over solid backing.
- .4 Bore holes true to line and to same size as bolts. Drive bolts into place for snug fit, and use plates or washers for bolthead and nut bearings. Turn up bolts and lag screws tightly when installed, and again just before concealed by other work or at completion of Work.
- .5 Provide anchors, bolts, and inserts required for attachment of the work of this Section, to those performing the work of other Sections and who are responsible for their installation.
- .6 Do not attach work by wood plugs or blocking in concrete or masonry. Use lead shields, expansion shields, or similar methods only as approved by Consultant.
- .7 Install resilient isolation components where indicated on reviewed shop drawings.

3.3 **MISCELLANEOUS WOODWORK**

- .1 Fit and install wood furring, strapping, grounds and blocking. Adequately size, correctly place and conceal members for finishes, fitments and for work under other Sections. Do not assume that Drawings show required work exactly or completely. Anchor wood members securely in place.

- .2 Install rough bucks, nailing strips and linings to rough openings as required for backing for frames and other work.
- .3 Except where steel supports are specifically shown, provide wood blocking and supports in metal stud partitions for fastening of item such as casework and other wall mounted accessories. Have respective trades approve the location of such wood blocking.
- .4 Bolt wood blocking or nailing strips to steel framing.
- .5 Align and plumb faces of furring and blocking to tolerance of 1:600.
- .6 Use fire retardant lumber for blocking/framing in ceiling spaces, partitions and bulkheads.
- .7 Lay sill plate gasket under bearing plates over foundation for outside walls as work progresses. Position gasket flush with exterior wall face.

3.4 STAIRS

- .1 Fabricate wood stringer of size, construction and attachment to structure as shown.
- .2 Furnish prefabricated treads and risers stapled and glued to stringer and indicated on detail drawings.
- .3 Support treads, risers and landings as detailed on reviewed shop drawings.

3.5 ROOF WOODWORK w

- .1 Install continuous wood nailers around roof perimeters, curbs and roof openings larger than 150 x 150 mm, and at edges of insulation as detailed. Install cut cant strips and continuous nailers on copings and curbs as detailed.
- .2 Install wood backing, dressed, tapered and recessed slightly below top surface of roof insulation and roof hopper.
- .3 Fasten roof woodwork at maximum 400 mm o.c. in staggered pattern unless noted otherwise.

3.6 BACKBOARDS

- .1 Install plywood backboards, primed and painted white on both sides, with fire retardant paint.
- .2 Use minimum 19 mm thick plywood on 19 x 38 mm furring around perimeter and at maximum 300 mm intermediate spacing.

3.7 NOTCHING AND DRILLING

- .1 Holes drilled in roof, floor or ceiling framing members shall be not larger than 1/4 the depth of the member, and located not less than 50 mm from the edges, unless the depth of the member is increased by the size of the hole.
- .2 Floor, roof and ceiling framing members may be notched provided the notch is located on the top of the member within $\frac{1}{4}$ the joist depth from the edge of bearing, and is not deeper than $\frac{1}{3}$ the joist depth, unless the depth of the member is increased by the size of the notch.
- .3 Do not notch, drill, or otherwise damage wall studs so that the undamaged portion of the stud is less than $\frac{2}{3}$ the depth of the stud, if the stud is load-bearing, or 40 mm if the stud is non-load-bearing, unless the weakened studs are suitably reinforced.
- .4 Do not notch, drill, or otherwise weaken the top plates in load-bearing walls and partitions to reduce the undamaged width to less than 50 mm, unless the weakened studs are suitably reinforced.
- .5 Do not notch, drill, or otherwise weaken roof truss members unless such notching or drilling is allowed for in the design of the truss.

3.8 FASTENERS

- .1 Frame, anchor, fasten, tie and brace members for required strength and rigidity.
- .2 Use hot dipped galvanized fasteners for exterior work and work below grade.
- .3 Countersink bolts and bolt heads as required for clearance of other work.
- .4 Size fasteners to penetrate base member by half of fastener length minimum. Minimize splitting of wood members by staggering nails in direction of grain.
- .5 For plywood use spiral, annular or resin coated nails and staples.

3.9 SURFACE-APPLIED WOOD PRESERVATIVE

- .1 Treat raw surfaces, drilled holes and cut ends of pressure treated wood with 2 coats of wood preservative immediately after cutting.
- .2 Apply preservative by dipping, by brush or by pouring into plugged holes to completely saturate surface.

END OF SECTION