

Part 1 General

1.1 REFERENCES

- .1 American National Standards Institute (ANSI)
 - .1 ANSI/NPA A208.1-[1999], Particleboard, Mat Formed Wood.
- .2 American Society for Testing and Materials International (ASTM)
 - .1 ASTM A653/A653M-[05a], Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvanealed) by the Hot-Dip Process.
 - .2 ASTM C36/C36M-[03], Standard Specification for Gypsum Wallboard.
 - .3 ASTM C578-[05a], Standard Specification for Rigid, Cellular Polystyrene Thermal Insulation.
 - .4 ASTM C1289-[05a], Standard Specification for Faced Rigid Cellular Polyisocyanurate Thermal Insulation Board.
 - .5 ASTM D1761-[88(2000)], Standard Test Methods for Mechanical Fasteners in Wood.
 - .6 ASTM D5055-[05], Standard Specification for Establishing and Monitoring Structural Capacities of Prefabricated Wood I-Joists.
 - .7 ASTM D5456-[05a], Standard Specification for Evaluation of Structural CompoSite Lumber Products.
- .1 Canada Green Building Council (CaGBC)
 - .1 LEED Canada Reference Guide for Green Building Design and Construction 2009
- .2 Canadian General Standards Board (CGSB)
 - .1 CAN/CGSB-11.3-[M87], Hardboard.
 - .2 CAN/CGSB-51.32-[M77], Sheathing, Membrane, Breather Type.
 - .3 CAN/CGSB-51.34-[M86], Vapour Barrier, Polyethylene Sheet for Use in Building Construction.
 - .4 CAN/CGSB-71.26-[M88], Adhesive for Field-Gluing Plywood to Lumber Framing for Floor Systems.
- .3 Canadian Standards Association (CSA International)
 - .1 CSA A123.2-[03], Asphalt Coated Roofing Sheets.
 - .2 CAN/CSA-A247-[M86], Insulating Fiberboard.
 - .3 CSA B111-[1974(R2003)], Wire Nails, Spikes and Staples.
 - .4 CAN/CSA-G164-[M92(R2003)], Hot Dip Galvanizing of Irregularly Shaped Articles.
 - .5 CSA O112 Series-[M1977(R2006)], CSA Standards for Wood Adhesives.
 - .6 CSA O121-[M1978(R2003)], Douglas Fir Plywood.
 - .7 CSA O122-[06], Structural Glued-Laminated Timber.
 - .8 CSA O141-[05], Softwood Lumber.
 - .9 CSA O151-[04], Canadian Softwood Plywood.
 - .10 CSA O153-[M1980(R2003)], Poplar Plywood.
 - .11 CAN/CSA-O325.0-[92(R2003)], Construction Sheathing.

- .12 CSA O437 Series-[93(R2006)], Standards on OSB and Waferboard.
- .4 Forest Stewardship Council (FSC)
 - .1 FSC-STD-01-001-[2004], FSC Principle and Criteria for Forest Stewardship.
 - .2 FSC-STD-20-002-[2004], Structure and Content of Forest Stewardship Standards V2-1
 - .3 FSC Accredited Certified Bodies.
- .5 National Lumber Grades Authority (NLGA)
 - .1 Standard Grading Rules for Canadian Lumber [2005].
- .6 South Coast Air Quality Management District (SCAQMD), California State (SCAQMD)
 - .1 SCAQMD Rule 1113-[04], Architectural Coatings.
 - .2 SCAQMD Rule 1168-[05], Adhesives and Sealants Applications.
- .7 Truss Design and Procedures for Light Metal Connected Wood Trusses, Truss Plate Institute of Canada.
- .8 Underwriters' Laboratories of Canada (ULC)
 - .1 CAN/ULC-S706-[97], Mineral Fibre Thermal Insulation for Buildings.

1.2 SUBMITTALS

- .1 Submit Submittal submissions: in accordance with Section 01 33 00 - Submittal Procedures.

1.3 QUALITY ASSURANCE

- .1 Lumber by grade stamp of an agency certified by Canadian Lumber Standards Accreditation Board.
- .2 Plywood, in accordance with CSA standards.

1.4 WASTE MANAGEMENT AND DISPOSAL

- .1 Separate and recycle waste materials in accordance with Section 01 74 19 – Waste Management and Disposal.
- .2 Place materials defined as hazardous or toxic waste in designated containers.
- .3 Ensure emptied containers are sealed and stored safely for disposal away for public.
- .4 Use chemical hardeners that are non-toxic, biodegradable and have zero or low VOC's.
- .5 Dispose of surplus chemical and finishing materials in accordance with Federal, Provincial and Municipal regulations.

Part 2 Products

2.1 FRAMING AND STRUCTURAL MATERIALS

- .1 Lumber: unless specified otherwise, softwood, S4S, moisture content 19% (S-dry) or less in accordance with following standards:

- .1 CSA O141.
- .2 NLGA Standard Grading Rules for Canadian Lumber.
- .3 Forestry Stewardship Council (FSC) certified.
- .2 Framing and board lumber: in accordance with NBC.
- .3 Furring, blocking, nailing strips, grounds, rough bucks, cants, curbs, fascia backing and sleepers:
 - .1 S2S is acceptable for all Work.
 - .2 Board sizes: "Standard" or better grade.
 - .3 Dimension sizes: "Standard" light framing or better grade.
 - .4 Post and timbers sizes: "Standard" or better grade.

2.2 PANEL MATERIALS

- .1 Indoor Environmental Quality
 - .1 SCAQMD Rule 1168, Adhesives and Sealants Applications.
- .2 Plywood, OSB and wood based compoSite panels: to CAN/CSA-O325.0.
- .3 Douglas fir plywood (DFP): to CSA O121, standard construction.
- .4 Canadian softwood plywood (CSP): to CSA O151, standard construction.
- .5 Poplar plywood (PP): to CSA O153, standard construction.
- .6 Interior mat-formed wood particleboard: to ANSI 208.1.
- .7 Mat-formed structural panelboards (OSB wafer): to CAN3-O437.0.
- .8 Insulating fiberboard sheathing: to CAN/CSA-A247.
- .9 Glass fibre board sheathing: non-structural, rigid, faced, fiberglass, insulating exterior sheathing board.
- .10 Isocyanurate sheathing: to ASTM C1289, faced.
- .11 Expanded polystyrene sheathing: to ASTM C578.
- .12 Gypsum sheathing: to ASTM C36/C36M.
- .13 Electrical equipment mounting boards:
 - .1 $\frac{3}{4}$ " Plywood G1S, DFP or CSP grade, square edge.

2.3 ACCESSORIES

- .1 Exterior wall sheathing paper: to CAN/CGSB-51.32 single ply, spunbonded olefin type coated impregnated as indicated.
- .2 Polyethylene film: to Section 07 26 00 – Vapour Retarders.
- .3 Sill Gasket Air seal: closed cell polyurethane or polyethylene.

- .4 Sealants: Section 07 92 00 – Joint Sealants.
- .5 General purpose adhesive: to CSA O112 Series.
- .6 Nails, spikes and staples: to CSA B111.
- .7 Bolts: 12.5 mm diameter unless indicated otherwise, complete with nuts and washers.
- .8 Proprietary fasteners: toggle bolts, expansion shields and lag bolts, screws and lead or inorganic fibre plugs, explosive actuated fastening devices, recommended for purpose by manufacturer.
- .9 Joist hangers: minimum 1 mm thick sheet steel, galvanized ZF001 coating designation.
- .10 Roof sheathing H-Clips: formed "H" shape, thickness to suit panel material, type approved by Contract Administrator.

2.4 FASTENER FINISHES

- .1 Galvanizing: to CAN/CSA-G164, use galvanized fasteners for exterior Work, pressure-preservative, fire-retardant, treated lumber.

Part 3 Execution

3.1 INSTALLATION

- .1 Comply with requirements of NBC 2010 Part 3 supplemented by following paragraphs.
- .2 Install members true to line, levels and elevations, square and plumb.
- .3 Construct continuous members from pieces of longest practical length.
- .4 Install spanning members with "crown-edge" up.
- .5 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.
- .6 Install wall sheathing in accordance with manufacturer's printed instructions.
- .7 Install roof sheathing in accordance with requirements of NBC.
- .8 Install furring and blocking as required to space-out and support casework, cabinets, wall and ceiling finishes, facings, fascia, soffit, siding electrical equipment mounting boards, and other Work as required.
- .9 Install furring to support siding applied vertically 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.
- .10 Install rough bucks, nailers and linings to rough openings as required to provide backing for frames and other Work.

- .11 Install wood cants, fascia backing, nailers, curbs and other wood supports as required and secure using galvanized fasteners.
- .12 Use dust collectors and high quality respirator masks when cutting or sanding wood panels.

3.2 ERECTION

- .1 Frame, anchor, fasten, tie and brace members to provide necessary strength and rigidity.
- .2 Countersink bolts where necessary to provide clearance for other Work.
- .3 Use nailing disks for soft sheathing as recommended by sheathing manufacturer.

3.3 SCHEDULES

- .1 Roof sheathing:
 - .1 Plywood, DFP or CSP sheathing grade (SHG) T&G edge, 16 mm thick, unless otherwise indicated.
- .2 Electrical equipment mounting boards:
 - .1 Plywood, DFP or CSP grade, (G1S) select square edge 16 mm thick, unless otherwise indicated.

END OF SECTION

Part 1 General

1.1 REFERENCES

- .1 ASTM International (ASTM):
 - .1 ASTM C 297, Standard Test Method for Flatwise Tensile Strength of Sandwich Constructions
 - .2 ASTM C473, Standard Test Methods for Physical Testing of Gypsum Panel Products.
 - .3 ASTM C518, Standard Test Method for Steady-State Thermal Transmission Properties by Means of the Heat Flow Meter Apparatus.
 - .4 ASTM C1002, Standard Specification for Steel Self-Piercing Tapping Screws for the Application of Gypsum Panel Products or Metal Plaster Bases to Wood Studs or Steel Studs.
 - .5 ASTM C1177, Standard Specification for Glass Mat Gypsum Substrate for Use as Sheathing.
 - .6 ASTM C1396, Standard Specification for Gypsum Board.
 - .7 ASTM C1280, Standard Specification for Application of Gypsum Sheathing.
 - .8 ASTM D3273, Standard Test Method for Resistance to Growth of Mold on the Surface of Interior Coatings in an Environmental Chamber.
 - .9 ASTM D6329, Standard Guide for Developing Methodology for Evaluating the Ability of Indoor Materials to Support Microbial Growth Using Static Environmental Chambers.
 - .10 ASTM E72, Standard Test Methods of Conducting Strength Tests of Panels for Building Construction.
 - .11 ASTM E 84, Standard Test Method for Surface Burning Characteristics of Building Materials.
 - .12 ASTM E96, Standard Test Methods for Water Vapor Transmission of Materials.
 - .13 ASTM E 119, Test Method for Fire Tests of Building Construction and Materials.
 - .14 ASTM E 1677, Standard Specification for an Air Retarder (AR) Material or System for Low-Rise Framed Building Walls.
- .2 Gypsum Association (GA): GA-253 Application of Gypsum Sheathing.
- .3 Canadian General Standards Board (CGSB)
 - .1 CAN/CGSB-51.34-[M86(R1988)], Vapour Barrier, Polyethylene Sheet for Use in Building Construction.
 - .2 CAN/CGSB-71.25-[M88], Adhesive, for Bonding Drywall to Wood Framing and Metal Studs.
- .4 Underwriters' Laboratories of Canada (ULC)
 - .1 CAN/ULC-S101, Fire Endurance Tests of Building Construction and Materials
 - .2 CAN/ULC-S102, Surface Burning Characteristics of Building Materials and Assemblies.
 - .3 CAN/ULC-S114, Standard Method of Test for Determination of Non-Combustibility in Building Materials
- .5 Canadian Standards Association (CSA)

- .1 CAN/CSA-A82.27: Gypsum Board
- .2 CAN/CSA-A82.31: Gypsum Board Application
- .1 Canada Green Building Council (CaGBC)
 - .1 LEED Canada Reference Guide for Green Building Design and Construction 2009

1.2 SUBMITTALS

- .1 Submit Submittal submissions: in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Product Data: Manufacturer's specifications and installation instructions for each product specified.

1.3 WASTE MANAGEMENT AND DISPOSAL

- .1 Separate and recycle waste materials in accordance with Section 01 74 19 – Waste Management and Disposal.
- .2 Place materials defined as hazardous or toxic waste in designated containers.
- .3 Ensure emptied containers are sealed and stored safely for disposal away for public.
- .4 Use chemical hardeners that are non-toxic, biodegradable and have zero or low VOC's.
- .5 Dispose of surplus chemical and finishing materials in accordance with Federal, Provincial and Municipal regulations.

1.4 WARRANTY

- .1 Provide products that offer twelve months of coverage against in-place exposure damage (delamination, deterioration and decay).
- .2 Manufacturer's Warranty:
 - .1 Five years against manufacturing defects.

Part 2 Products

2.1 MANUFACTURERS AND PRODUCTS

- .1 Georgia-Pacific Gypsum LLC:
 - .1 Fiberglass-Mat Faced Gypsum Sheathing: DensGlass Sheathing.
 - .2 Fiberglass-Mat Faced Gypsum Sheathing, Type X for Fire Rated Designs: DensGlass Fireguard Sheathing.

2.2 MATERIALS

- .1 Fiberglass-Mat Faced Gypsum Sheathing: ASTM C1177:
 - .1 Thickness: 1/2"
 - .2 Width: 4 feet.
 - .3 Length: Maximum practical length

- .4 Weight: 1.9 lb/sq. ft.
- .5 Edges: Square.
- .6 Surfacing: Fiberglass mat on face, back, and long edges.
- .7 Racking Strength (Ultimate, not design value) (ASTM E72): Not less than 540 pounds per square foot, dry.
- .8 Flexural Strength, Parallel (ASTM C473): 80 lbf, parallel.
- .9 Humidified Deflection (ASTM C1177): Not more than 2/8 inch.
- .10 Permeance (ASTM E96): 23 perms.
- .11 R-Value (ASTM C518): 0.56.
- .12 Mold Resistance (ASTM D3273): 10, in a test as manufactured.
- .13 Microbial Resistance (ASTM D6329, GREENGUARD 3-week protocol): Will not support microbial growth.
- .14 Acceptable Products:
 - .1 1/2" DensGlass Sheathing by Georgia-Pacific Gypsum (or approved equal in accordance with B7).
- .2 Fire-Rated Fiberglass-Mat Faced Gypsum Sheathing: ASTM C1177, Type X:
 - .1 Thickness: 5/8 inch.
 - .2 Width: 4 feet.
 - .3 Length: Maximum practical length
 - .4 Weight: 2.5 lb/sq. ft.
 - .5 Edges: Square.
 - .6 Surfacing: Fiberglass mat on face, back, and long edges.
 - .7 Racking Strength (Ultimate, not design value) (ASTM E72): Not less than 654 pounds per square foot, dry.
 - .8 Flexural Strength, Parallel (ASTM C1177): 100 lbf, parallel.
 - .9 Humidified Deflection (ASTM C1177): Not more than 1/8 inch.
 - .10 Permeance (ASTM E96): Not more than 17 perms.
 - .11 R-Value (ASTM C518): 0.67.
 - .12 Mold Resistance (ASTM D3273): 10, in a test as manufactured.
 - .13 Microbial Resistance (ASTM D6329, GREENGUARD 3-week protocol): Will not support microbial growth.
 - .14 Acceptable Products:
 - .1 5/8" DensGlass Fireguard Sheathing by Georgia-Pacific Gypsum (or approved equal in accordance with B7).

2.3 SUBSTITUTIONS

- .1 Refer to Section B7 – Substitutes of Bid Opportunity 748-2013.

2.4 ACCESSORIES

- .1 Screws: ASTM C1002, corrosion resistant treated.

Part 3 Execution

3.1 EXAMINATION

- .1 Verification of Conditions:
 - .1 Inspection: Verify that project conditions and substrates are acceptable, to the installer, to begin installation of Work of this section.

3.2 INSTALLATION

- .1 General: In accordance with GA-253, ASTM C1280 and the manufacturer's recommendations.

3.3 PROTECTION

- .1 Protect gypsum board installations from damage and deterioration until date of Substantial Completion.

END OF SECTION

Part 1 General

1.1 REFERENCES

- .1 American National Standards Institute:
 - .1 ANSI A118.9: Specification for Cementitious Backer Units.
- .2 American Society for Testing and Materials International (ASTM)
 - .1 ASTM C 954: Specification for Steel Drill Screws for the Application of Gypsum Panel Products or Metal Plaster Bases to Steel Studs from 0.033 inch to 0.110 inch in Thickness.
 - .2 ASTM C 1002: Standard Specification for Steel Self-Piercing Tapping Screws for the Application of Gypsum Panel Products or Metal Plaster Bases to Wood Studs or Steel Studs.
 - .3 ASTM C 1280: Standard Specification for Application of Gypsum Sheathing.
 - .4 ASTM C 1325: Standard Specification for Non-Asbestos Fiber-Mat Reinforced Cement Interior Substrate Sheets.
 - .5 ASTM D 226: Standard Specification for Asphalt-Saturated Organic Felt Used in Roofing and Waterproofing.
 - .6 ASTM E 84: Standard Test Method for Surface Burning Characteristics of Building Materials.
 - .7 ASTM E119: Test Method for Fire Tests of Building Construction and Materials.
 - .8 ASTM E 1677: Standard Specification for an Air Retarder (AR) Material or System for Low-Rise Framed Building Walls.
- .1 Canada Green Building Council (CaGBC)
 - .1 LEED Canada Reference Guide for Green Building Design and Construction 2009

1.2 SUBMITTALS

- .1 Submit Submittal submissions: in accordance with Section 01 33 00 - Submittal Procedures.

1.3 QUALITY ASSURANCE

- .1 Fire Resistance Rated Assembly Characteristics: Provide materials and construction identical to those tested in accordance to ASTM E 119 by an independent testing and inspection agency acceptable to authorities having jurisdiction.
 - .1 Fire Resistance Ratings: Indicated by design designations from UL Fire Resistance Directory.

1.4 DELIVERY, STORAGE, AND HANDLING

- .1 All materials shall be delivered in their original unopened packages and stored in an enclosed shelter providing protection from damage and exposure to the elements. WARNING: Store all Cement Board flat. Panels are heavy and can fall over, causing serious injury or death. Do not move unless authorized.

1.5 WASTE MANAGEMENT AND DISPOSAL

- .1 Separate and recycle waste materials in accordance with Section 01 74 19 – Waste Management and Disposal.
- .2 Place materials defined as hazardous or toxic waste in designated containers.
- .3 Ensure emptied containers are sealed and stored safely for disposal away for public.
- .4 Use chemical hardeners that are non-toxic, biodegradable and have zero or low VOC's.
- .5 Dispose of surplus chemical and finishing materials in accordance with Federal, Provincial and Municipal regulations.

Part 2 Products

2.1 WALL SHEATHING

- .1 Cementitious Fiber-Mat Reinforced Sheathing: ASTM C 1325, ANSI A118.9, cementitious backer.
 - .1 Product: Subject to compliance with requirements, provide DUROCK Brand Cement Board by United States Gypsum Company (or approved equal in accordance with B7).
 - .2 Type and Thickness: ½" (12 mm) thick.
 - .3 Size: 48" by 96" (610 mm x 1220 mm).

2.2 FASTENERS

- .1 General: Provide fasteners of size and type indicated that comply with requirements specified in this Article for material and application.
- .2 Nails: 11-gauge hot-dipped galvanized roofing nails, sized to suit.
- .3 Wood Screws: DUROCK Brand Wood or USG Sheathing WF screws, sized to suit, with corrosion-resistant coating.
- .4 Screws for Fastening Gypsum Sheathing to Cold-Formed Metal Framing: DUROCK Brand Steel or USG Sheathing SF steel drill screws, sized to suit, with corrosion-resistant coating.
 - .1 For steel framing less than 0.0329 inch thick, attach sheathing to comply with ASTM C 1002.
 - .2 For steel framing from 0.033 to 0.112 inch thick, attach sheathing to comply with ASTM C 954.

2.3 SUBSTITUTIONS

- .1 Refer to Section B7 – Substitutes of Bid Opportunity 748-2013.

2.4 MISCELLANEOUS MATERIALS

- .1 Flexible Flashing: Composite, self-adhesive, flashing product consisting of a pliable, rubberized-asphalt compound, bonded to a high-density, cross-laminated polyethylene film.

- .2 Primer for Flexible Flashing: Product recommended by manufacturer of flexible flashing for substrate.
- .3 Metal reveal joints: 16 gauge aluminum strapping between panel joints.

2.5 SUBSTITUTIONS:

- .1 Refer to Section B7 – Substitutes of Bid Opportunity 748-2013.

Part 3 Execution

3.1 INSTALLATION, GENERAL

- .1 Do not use materials with defects that impair quality of sheathing or pieces that are too small to use with minimum number of joints or optimum joint arrangement.
- .2 Cut panels at penetrations, edges, and other obstructions of Work; fit tightly against abutting construction, unless otherwise indicated.
- .3 Coordinate wall sheathing installation with flashing and joint-sealant installation so these materials are installed in sequence and manner that prevent exterior moisture from passing through completed assembly.
- .4 Do not bridge building expansion joints; cut and space edges of panels to match spacing of structural support elements.

3.2 GYPSUM SHEATHING INSTALLATION

- .1 Comply with ASTM C 1280, GA-253 and manufacturer's written instructions.
 - .1 Fasten sheathing to wood framing with screws.
 - .2 Fasten sheathing to cold-formed metal framing with screws.
 - .3 Install boards with a 3/8-inch gap where non-load-bearing construction abuts structural elements.
 - .4 Install boards with a 1/4-inch gap where they abut masonry or similar materials that might retain moisture, to prevent wicking.
- .2 Apply fasteners so heads bear tightly against face of sheathing boards but do not cut into facing.
- .3 Horizontal Installation: Abut ends of boards over centers of studs, and stagger end joints of adjacent boards not less than one stud spacing. Attach boards at perimeter and within field of board to each stud.
 - .1 Space fasteners approximately 8 inches o.c. and set back a minimum of 3/8 inch from edges and ends of boards.
 - .2 For sheathing under stucco cladding, boards may be initially tacked in place with screws if overlying self-furring metal lath is screw-attached through sheathing to studs immediately after sheathing is installed.
- .4 Vertical Installation: Install board vertical edges centered over studs. Abut ends and edges of each board with those of adjacent boards. Attach boards at perimeter and within field of board to each stud.

- .1 Space fasteners approximately 8 inches o.c. and set back a minimum of 3/8 inch from edges and ends of boards.
- .2 For sheathing under stucco cladding, boards may be initially tacked in place with screws if overlying self-furring metal lath is screw-attached through sheathing to studs immediately after sheathing is installed.

3.3 FLEXIBLE FLASHING INSTALLATION

- .1 Apply flexible flashing where indicated to comply with manufacturers written instructions.
 - .1 Prime substrates as recommended by flashing manufacturer.
 - .2 Lap seams and junctures with other materials at least 4 inches, except that at flashing flanges of other construction, laps need not exceed flange width.
 - .3 Lap flashing over weather-resistant building paper at bottom and sides of openings.
 - .4 Lap weather-resistant building paper over flashing at heads of openings.
 - .5 After flashing has been applied, roll surfaces with a hard rubber or metal roller to ensure that flashing is completely adhered to substrates.

END OF SECTION

Part 1 General

1.1 RELATED REQUIREMENTS

- .1 Section 05 12 23 – Structural Steel for Buildings.

1.2 REFERENCES

- .1 All references to be the latest edition as of the date indicated on the specifications.
- .2 ASTM International
 - .1 ASTM A36/A36M, Standard Specification for Carbon Structural Steel.
 - .2 ASTM A47/A47M, Standard Specification for Ferritic Malleable Iron Castings.
 - .3 ASTM A123/A123M, Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products.
 - .4 ASTM A307, Standard Specification for Carbon Steel Bolts and Studs, 60,000 PSI Tensile Strength.
 - .5 ASTM A653/A653M, Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
- .3 Canada Green Building Council (CaGBC)
 - .1 LEED Canada-NC Version 1.0, LEED (Leadership in Energy and Environmental Design): Green Building Rating System for New Construction and Major Renovations (including Addendum).
- .4 CSA International
 - .1 CSA B111, Wire Nails, Spikes and Staples.
 - .2 CSA G40.20/G40.21, General Requirements for Rolled or Welded Structural Quality Steel/Structural Quality Steel.
 - .3 CAN/CSA O80 Series, Wood Preservation.
 - .4 CSA O86 Consolidation, Engineering Design in Wood.
 - .5 CSA O112.10, Evaluation of Adhesives for Structural Wood Products (Limited Moisture Exposure).
 - .6 CAN/CSA-O122, Structural Glued-Laminated Timber.
 - .7 CSA O177, Qualification Code for Manufacturer's of Structural Glued-Laminated Timber.
 - .8 CSA S16, Design of Steel Structures.
 - .9 CSA W47.1, Certification of Companies for Fusion Welding of Steel Structures.
 - .10 CAN/CSA-Z809, Sustainable Forest Management.
- .5 Forest Stewardship Council (FSC)
 - .1 FSC-STD-01-001, FSC Principle and Criteria for Forest Stewardship.
- .6 Health Canada/Workplace Hazardous Materials Information System (WHMIS)
 - .1 Material Safety Data Sheets (MSDS).
- .7 South Coast Air Quality Management District (SCAQMD), California State, Regulation XI. Source Specific Standards
 - .1 SCAQMD Rule 1113, Architectural Coatings.
- .8 Sustainable Forestry Initiative (SFI)

- .1 SFI Standard.
- .9 The Master Painters Institute (MPI)
 - .1 Architectural Painting Specification Manual.
 - .2 MPI #79 Primer, Alkyd, Anti-Corrosive for Metal.

1.3 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 two copies of WHMIS MSDS in accordance with Section 01 35 29 - Health and Safety Requirements and Section 01 35 43 - Environmental Procedures.
- .3 Shop Drawings:
 - .1 Submit drawings stamped and signed by Professional Engineer registered or licensed in the Province of Manitoba, 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 Certifications: submit certificates signed by manufacturer certifying that materials comply with specified performance characteristics and physical properties.
 - .1 Submit manufacturer's plant certification to CSA O177, Appendix B at completion of fabrication.
- .5 Manufacturer's Instructions: submit manufacturer's installation instructions and special handling criteria, installation sequence, cleaning procedures.
- .6 Manufacturers Reports:
 - .1 Manufacturer's Field Reports: submit manufacturer's written reports within 3 days of review, verifying compliance of Work, as described in Part 3 - FIELD QUALITY CONTROL.
- .7 Sustainable Design Submittals:
 - .1 LEED Canada submittals: in accordance with Section 01 35 20 – LEED Sustainable Requirements.
 - .2 Construction Waste Management:
 - .1 Submit project Waste Management Plan and Waste Reduction Workplan highlighting recycling and salvage requirements.
 - .2 Submit calculations on end-of-project recycling rates, salvage rates, and landfill rates.
 - .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 that project incorporates required percentage 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 manufacturer'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, sealants, 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 that they contain no added urea-formaldehyde resins, and the laminate adhesives used in building, stating that they contain no urea-formaldehyde.

1.4 QUALITY ASSURANCE

- .1 Qualifications:
 - .1 Manufacture structural glued-laminated members in plant certified by CSA as meeting requirements of CSA O177, class X.
 - .2 Submit certificate in accordance with CSA O177, Appendix B at completion of fabrication.
 - .3 Fabricator for welded steel connections to be 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.

1.5 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 members prior to leaving plant with a 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 off the ground, in a dry location and in accordance with manufacturer's written instructions.
 - .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 Cover glued-laminated units with opaque moisture resistant membrane if stored outside.

- .5 Store and protect glue-laminated products from nicks, scratches, blemishes and other damage.
- .6 Replace defective or damaged materials with new.
- .4 Develop Construction Waste Management Plan and Waste Reduction Workplan related to Work of this Section and in accordance with Section 01 35 20 - LEED Sustainable Requirements.
- .5 Packaging Waste Management: remove for reuse and return by manufacturer of pallets, crates, padding and packaging materials as specified Section 01 35 20 LEED Sustainable Requirements and 01 74 19 Waste Management and Disposal.
 - .1 Ensure preservative treated wood is disposed of by means other than for recycling or reuse.
 - .2 Dispose of treated wood, end pieces, wood scraps and sawdust in accordance with Section 01 35 20 – LEED Sustainable Requirements.
 - .3 Dispose of unused wood preservative material at official hazardous material collections site approved by Contract Administrator.
 - .4 Divert unused wood materials from landfill to recycling, reuse and/or composting facility in accordance with Section 01 35 20 – LEED Sustainable Requirements.

Part 2 Products

2.1 MATERIALS

- .1 Laminating stock: Douglas Fir-Larch to CAN/CSA-O122.
- .2 Adhesive: to CSA O112.10, to grade of service required in accordance with CAN/CSA-O122.
- .3 Sealer for glued-laminated members: penetrating type for exterior exposure, clear, non-yellowing liquid.
 - .1 VOC limit to SCAQMD and in accordance with Section 01 35 20 – LEED Sustainable Requirements.
 - .2 Coordinate sealer and Glulam finish with Architectural.
- .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.
 - .3 Lag screws: to CSA O86.
 - .4 Bolts: to ASTM A307.
 - .5 Side plates: to CSA G40.20/G40.21 and ASTM A36.
 - .6 Drift pins: to ASTM A307.
 - .7 Glued-laminated rivets: hot dip galvanized to CSA G40.20/G40.21 and ASTM A36.
 - .8 Nails and spikes: to CSA B111.
- .5 Shop coat primer for steel connections: to MPI #18.
- .6 Galvanizing: to ASTM A123/A123M, hot dipped, minimum zinc coating of 610 g/m².

2.2 FABRICATION

- .1 Fabricate members to following classifications:
 - .1 Stress grade: to CSA O86 24f-EX.
 - .2 Service grade: exterior.
 - .3 Appearance grade: quality.
- .2 Mark laminated members for identification during erection. Marks not to be visible in final assembly.
- .3 Do not apply sealer to areas which are to receive stained finish or preservative treatment.
- .4 Glulam to steel connections:
 - .1 The Glulam to steel connections shall be designed and detailed by the Glulam supplier.
 - .2 The Glulam connections to be reviewed by the steel supplier to confirm the design is adequate for the steel components. Steel supplier to reinforce steel components in the area of the connection as required to resist the applied forces.
 - .3 The Glulam connections shall be supplied by the steel supplier.
 - .4 Use concealed type connections where possible.
- .5 Glulam cross sectional area to meet the minimum sizes shown on the drawings. Increase the cross sectional area as required to account for sloping of the top of the Glulam to fit flush to the roof deck. Increase the cross sectional area of the Glulam to account for sloping of the bottom of the Glulam members for architectural requirements.
- .6 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.
- .7 Galvanize connections after fabrication.

Part 3 Execution

3.1 EXAMINATION

- .1 Verification of Conditions: verify conditions of substrates previously installed under other Sections or Contracts are acceptable for glue-laminated material installation in accordance with manufacturer's written instructions.
 - .1 Visually inspect substrate in presence of Contract Administrator.
 - .2 Inform Contract Administrator 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 Contract Administrator.

3.2 ERECTION

- .1 Protect protective sealer from damage before erection.
 - .1 Touch up damaged areas on site with specified sealer.
- .2 Erect glued-laminated members 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 Do not field cut or alter members without Contract Administrator's approval. If approved, preservative treat cut ends of treated members.

3.3 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 19 - Waste Management and Disposal and Section 01 35 20 - LEED Sustainable Requirements.
 - .1 Remove recycling containers and bins from site and dispose of materials at appropriate facility.

3.4 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

Part 1 General

1.1 REFERENCES

- .1 American National Standards Institute (ANSI)
 - .1 ANSI A208.1-[99], Particleboard.
 - .2 ANSI A208.2-[02], Medium Density Fibreboard (MDF).
 - .3 ANSI/HPVA HP-1-[2004], Standard for Hardwood and Decorative Plywood.
- .2 American Society for Testing and Materials International (ASTM)
 - .1 ASTM E1333-[96(2002)], Standard Test Method for Determining Formaldehyde Concentrations in Air and Emissions Rates from Wood Products Using a Large Chamber.
- .3 Architectural Woodwork Manufacturers Association of Canada (AWMAC) and Architectural Woodwork Institute (AWI)
 - .1 Architectural Woodwork Quality Standards Illustrated, 8th edition, Version 1.0 [2003].
- .4 Canadian General Standards Board (CGSB)
 - .1 CAN/CGSB-11.3-[M87], Hardboard.
- .5 Canadian Plywood Association (CanPly)
 - .1 The Plywood Handbook [2005].
- .6 Canadian Standards Association (CSA International)
 - .1 CSA B111-[74(R2003)], Wire Nails, Spikes and Staples.
 - .2 CAN/CSA-G164-[M92(R2003)], Hot Dip Galvanizing of Irregularly Shaped Articles.
 - .3 CSA O121-[M89(R2003)], Douglas Fir Plywood.
 - .4 CAN/CSA O141-[91(R1999)], Softwood Lumber.
 - .5 CSA O151-[04], Canadian Softwood Plywood.
 - .6 CSA O153-[M1980(R2003)], Poplar Plywood.
 - .7 CSA Z760-[94], Life Cycle Assessment.
- .7 Forest Stewardship Council (FSC)
 - .1 FSC-STD-01-001-[2004], FSC Principle and Criteria for Forest Stewardship.
- .8 National Hardwood Lumber Association (NHLA)
 - .1 Rules for the Measurement and Inspection of Hardwood and Cypress [1998].
- .9 National Lumber Grades Authority (NLGA)
 - .1 Standard Grading Rules for Canadian Lumber [2005].
- .10 South Coast Air Quality Management District (SCAQMD), California State (SCAQMD)
 - .1 SCAQMD Rule 1113-[04], Architectural Coatings.
 - .2 SCAQMD Rule 1168-[05], Adhesives and Sealants Applications.
- .11 Underwriters Laboratories of Canada (ULC)

- .1 CAN4-S104-[80(R1985)], Standard Method for Fire Tests of Door Assemblies.
- .2 CAN4-S105-[85(R1992)], Standard Specification for Fire Door Frames, meeting the Performance Required by CAN4-S104.
- .1 Canada Green Building Council (CaGBC)
 - .1 LEED Canada Reference Guide for Green Building Design and Construction 2009

1.2 SUBMITTALS

- .1 Shop Drawings Submittals: in accordance with Section 01 33 00 - Submittal Procedures.
 - .1 Indicate details of Construction, profiles, jointing, fastening and other related details.
 - .2 Indicate materials, thickness, finishes and hardware.

1.3 QUALITY ASSURANCE

- .1 Lumber by grade stamp of an agency certified by Canadian Lumber Standards Accreditation Board.
- .2 Plywood, in accordance with CSA standards and AWMAC custom grade.
- .3 Wood fire rated frames and panels: listed and labelled by an organization accredited by Standards Council of Canada in conformance with CAN4-S104 and CAN4-S105 for ratings specified or indicated.

1.4 DELIVERY, STORAGE, AND HANDLING

- .1 Deliver, handle, store and protect materials in accordance with Section 01 61 00 - Common Product Requirements
 - .1 Protect materials against dampness during and after delivery.
 - .2 Store materials in ventilated areas, protected from extreme changes of temperature or humidity.

1.5 WASTE MANAGEMENT AND DISPOSAL

- .1 Separate and recycle waste materials in accordance with Section 01 74 19 – Waste Management and Disposal.
- .2 Place materials defined as hazardous or toxic waste in designated containers.
- .3 Ensure emptied containers are sealed and stored safely for disposal away for public.
- .4 Use chemical hardeners that are non-toxic, biodegradable and have zero or low VOC's.
- .5 Dispose of surplus chemical and finishing materials in accordance with Federal, Provincial and Municipal regulations.

Part 2 Products

2.1 LUMBER MATERIAL

- .1 Softwood lumber: unless specified otherwise, S4S in accordance with following standards:
 - .1 CAN/CSA-O141.
 - .2 NLGA Standard Grading Rules for Canadian Lumber.
 - .3 AWMAC premium grade, moisture content as specified.
- .2 Machine stress-rated lumber is acceptable.
- .3 Hardwood lumber: in accordance with following standards:
 - .1 National Hardwood Lumber Association (NHLA).
 - .2 AWMAC custom grade, moisture content as specified.

2.2 PANEL MATERIAL

- .1 Douglas fir plywood (DFP): to CSA O121, standard construction.
 - .1 Urea-formaldehyde free.
- .2 Canadian softwood plywood (CSP): to CSA O151, standard construction.
 - .1 Urea-formaldehyde free.
- .3 Hardwood plywood: to ANSI/HPVA HP-1.
 - .1 Urea-formaldehyde free.
- .4 Poplar plywood (PP): to CSA O153, standard construction.
 - .1 Urea-formaldehyde free.
- .5 Particleboard: to ANSI A208.1.
 - .1 Urea-formaldehyde free.
- .6 Hardboard: to CAN/CGSB-11.3.
 - .1 Urea-formaldehyde free.
- .7 Medium density fibreboard (MDF): to ANSI A208.2, density 640-800 kg/m³.
 - .1 Urea-formaldehyde free.
 - .1 Medium density fibreboard
 - .1 Forestry Stewardship Council (FSC) certified.
 - .2 Urea-formaldehyde free.
- .8 Low density fibreboard: to CSA-A247M.
 - .1 Urea-formaldehyde free.
- .9 Decorative overlaid composite panels.
 - .1 Decorative overlay, heat and pressure laminated with suitable resin to 12.7 mm thick particleboard MDF core.
 - .2 Overlay bonded to both faces where exposed two sides, and when panel material require surface on one side only, reverse side to be overlaid with a plain (buff) balancing sheet.

- .3 Edge finishing: matching melamine and polyester overlay edge strip with self-adhesive.

2.3 ACCESSORIES

- .1 Nails and staples: to CSA B111; galvanized to CAN/CSA-G164 for exterior Work, interior humid areas and for treated lumber; plain finish elsewhere.
- .2 Wood screws: electroplated, type and size to suit application.
- .3 Splines: wood, plastic, metal.
- .4 Adhesive: recommended by manufacturer.
 - .1 Adhesives: maximum VOC limit 30g/L.

Part 3 Execution

3.1 INSTALLATION

- .1 Do finish carpentry to Quality Standards of the Architectural Woodwork Manufacturers Association of Canada (AWMAC), except where specified otherwise.
- .2 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 Form joints to conceal shrinkage.

3.2 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.
- .2 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° scarf type joint.
 - .4 Install door and window trim in single lengths without splicing.
- .3 Panelling:

- .1 Secure panelling and perimeter trim using adhesive recommended for purpose by manufacturer. Fill nail holes caused by temporary fixing with filler matching wood in colour.
 - .2 Secure panelling and perimeter trim using concealed fasteners.
 - .3 Secure panelling and perimeter trim using counter sunk screws plugged with matching wood plugs.
-
- .4 Shelving.
 - .1 Install shelving on shelf brackets, where indicated.
 - .5 Hardware.
 - .1 Install cabinet and miscellaneous hardware as indicated.

END OF SECTION

Part 1 General

1.1 REFERENCES

- .1 American National Standards Institute (ANSI)
 - .1 ANSI/NPA A208.1, Particle board.
 - .2 ANSI A208.2, Medium Density Fiberboard (MDF) for Interior Applications.
 - .3 ANSI/HPVA HP-1, Standard for Hardwood and Decorative Plywood.
- .2 Architectural Woodwork Manufacturers Association of Canada (AWMAC) and Architectural Woodwork Institute (AWI)
 - .1 Architectural Woodwork Quality Standards Illustrated.
- .3 American Society for Testing and Materials (ASTM)
 - .1 ASTM E1333, Standard Test Method for Determining Formaldehyde Concentrations in Air and Emission Rates From Wood Products Using a Large Chamber.
- .4 Canadian General Standards Board (CGSB)
 - .1 CAN/CGSB-71.20, Adhesive, Contact, Brushable.
- .5 Canadian Standards Association (CSA)
 - .1 CSA B111, Wire Nails, Spikes and Staples.
 - .2 CSA O112.4, Standards for Wood Adhesives.
 - .3 CSA O121, Douglas Fir Plywood.
 - .4 CSA O141, Softwood Lumber.
 - .5 CSA O151, Canadian Softwood Plywood.
 - .6 CSA O153, Poplar Plywood.
- .6 National Hardwood Lumber Association (NHLA)
 - .1 Rules for the Measurement and Inspection of Hardwood and Cypress.
- .7 National Lumber Grades Authority (NLGA)
 - .1 Standard Grading Rules for Canadian Lumber.
- .1 Canada Green Building Council (CaGBC)
 - .1 LEED Canada Reference Guide for Green Building Design and Construction 2009

1.2 QUALITY ASSURANCE

- .1 Provide Certificate of Quality Compliance upon completion of Fabrication, in accordance with Architectural Woodwork Manufacturer's Association of Canada (AWMAC) quality standards.
- .2 Provide Certificate of Quality Compliance upon satisfactory completion of installation.

- .3 Work shall be in accordance with the Grade or Grades specified of the *Architectural Woodwork Standards*.
- .4 Qualification:
 - .1 Firm (woodwork manufacturer) with no less than 5 years of production experience similar to a specific project, whose qualifications indicate the ability to comply with the requirements of this Section.
 - .2 The woodwork manufacturer must have at least one project in the past 5 years where the value of the woodwork was within 20 percent of the cost of woodwork for this Project.

1.3 SUBMITTALS

- .1 In accordance with Section 01 33 00 - Submittal Procedures.
- .2 Indicate details of construction, profiles, jointing, fastening and other related details.
Scales:
 - .1 profiles full size, details 1/2 full size.
- .3 Indicate all materials, thicknesses, finishes and hardware.
- .4 Indicate locations of service outlets in casework, typical and special installation conditions, and connections, attachments, anchorage and location of exposed fastenings.
- .5 Submit duplicate colour samples of laminated plastic for colour selection.
- .6 Submit duplicate samples of laminated plastic joints, edging, cutouts, and postformed profiles.

1.4 SHOP DRAWINGS

- .1 Submit shop drawings
- .2 Indicate details of construction, profiles, jointing, fastening and other related details.
 - .1 Scales: profiles, details 1/2 full size.
- .3 Indicate locations of service outlets in casework, typical and special installation conditions, and connections, attachments, anchorage and location of exposed fastenings.

1.5 DELIVERY, STORAGE, AND HANDLING

- .1 Deliver, handle, store and protect materials of this section in accordance with Section 01 61 00 - Common Product Requirements.
- .2 Deliver materials only when the project is ready for installation and the Contractor has provided a clean storage area.
 - .1 Delivery of architectural millwork shall be made only when the area of operation is enclosed, all plaster and concrete Work is dry and the area broom clean.

- .2 Maintain indoor temperature and humidity within the range recommended by the Architectural Woodwork Standards for the location of the project.

1.6 SCHEDULING

- .1 Coordinate fabrication, delivery, and installation with the Contractor and other applicable trades.

1.7 WASTE MANAGEMENT AND DISPOSAL

- .1 Separate and recycle waste materials in accordance with Section 01 74 19 – Waste Management and Disposal.
- .2 Place materials defined as hazardous or toxic waste in designated containers.
- .3 Ensure emptied containers are sealed and stored safely for disposal away for public.
- .4 Use chemical hardeners that are non-toxic, biodegradable and have zero or low VOC's.
- .5 Dispose of surplus chemical and finishing materials in accordance with Federal, Provincial and Municipal regulations.

Part 2 Products

2.1 MATERIALS

- .1 Softwood lumber: unless specified otherwise, S4S, moisture content 19 % or less in accordance with following standards:
 - .1 CAN/CSA-O141.
 - .2 NLGA Standard Grading Rules for Canadian Lumber.
 - .3 AWMAC premium grade, moisture content as specified.
- .2 Machine stress-rated lumber is acceptable for all purposes.
- .3 Hardwood lumber: moisture content 10% or less in accordance with following standards:
 - .1 National Hardwood Lumber Association (NHLA).
 - .2 AWMAC premium grade, moisture content as specified.
- .4 Douglas fir plywood (DFP): to CSA O121, standard construction.
 - .1 NAUF - Urea-formaldehyde free.
- .5 Canadian softwood plywood (CSP): to CSA O151, standard construction.
 - .1 NAUF - Urea-formaldehyde free.
- .6 Hardwood plywood: to ANSI/HPVA HP-1.
 - .1 Urea-formaldehyde free.
- .7 Poplar plywood (PP): to CSA O153, standard construction.

- .1 NAUF - Urea-formaldehyde free.
- .8 Birch plywood: to AWMAC Natural.
 - .1 NAUF - Urea-formaldehyde free.
- .9 Hardboard: to CAN/CGSB – 11.3.
 - .1 Urea-formaldehyde free.
- .10 Medium density fibreboard (MDF): to ANSI A208.2, density 769 kg/m³
 - .1 NAUF - Urea-formaldehyde free.
 - .2 Must meet the performance requirements of ANSI A208.2
- .11 Particleboard core: to ANSI 208.1, sanded faces, of thickness indicated.
 - .1 NAUF - Urea-formaldehyde free.
- .12 Laminated plastic: to CAN3-A172, Section 06 47 00 – Plastic Laminate Finishes.
- .13 Thermofused Melamine Composite Panel (MCP): to NEMA LD3 Grade VGL.
 - .1 High wear resistant thermofused melamine: equal or exceed 400 cycles (Minimum standard for HPL abrasion test).
- .14 Nails and staples: to CSA B111.
- .15 Wood screws: steel plain, type and size to suit application.
- .16 Splines: wood.
- .17 Sealant: Section 07 92 00 – Joint Sealants.
- .18 Glazing: provide glazing to the requirements of Section 08 80 00 – Glazing.

2.2 MANUFACTURED UNITS

- .1 Kitchen Casework and Office Storage Unit: Fabricate caseworks to AWMAC custom quality grade.
 - .1 Furring, blocking, nailing strips, grounds and rough bucks and sleepers:
 - .1 S2S is acceptable.
 - .2 Board sizes: "Standard" or better grade.
 - .3 Dimension sizes: "Standard" light framing or better grade.
 - .2 Casework bodies (ends, divisions, and bottoms):
 - .1 Melamine (MCP): 19 mm thickness; colour to be determined by Contract Administrator.
 - .2 Edge banding: Melamine (MCP) all exposed edges.
 - .3 Backs:
 - .1 Typical: hardboard, 6 mm thickness; colour to be determined by Contract Administrator.
 - .2 Large Storage Pantry: 16 mm G1S birch plywood backing.
 - .4 Base:

- .1 Fir plywood marine base, 19 mm thickness to sizes as indicated.
- .5 Drawers: Fabricate drawers to AWMAC custom grade supplemented as follows:
 - .1 Sides and Backs and Bottoms:
 - .1 Melamine (MCP): 13 mm thickness; colour to be determined by Contract Administrator.
 - .2 Edge banding: Melamine (MCP) all exposed edges.
 - .2 Fronts:
 - .1 Melamine: 19 mm thickness;
 - .1 Provide 2 colours; Colours to be determined by Contract Administrator.
 - .2 Edge banding: Melamine (MCP) all exposed edges.
- .6 Doors: Fabricate doors to AWMAC custom grade supplemented as follows:
 - .1 Melamine (MCP): 19 mm thickness;
 - .1 Provide 2 colours; Colours to be determined by Contract Administrator. Colours to be determined by Contract Administrator.
 - .2 Edge banding: Melamine (MCP) all exposed edges. 3mm edging on doors where indicated,
- .7 Kitchen Casework Shelving: Fabricate shelving to AWMAC custom grade supplemented as follows:
 - .1 Melamine (MCP): 19 mm thickness for shelves up to 32" long; colour to be determined by Contract Administrator.
 - .2 Melamine (MCP): 25 mm thickness for shelves more than 32" long; colour to be determined by Contract Administrator.
 - .3 Melamine (MCP): 25 mm thickness for pull out shelves: colour to be determined by Contract Administrator.
 - .4 G2S Douglas fir Plywood: 19 mm thickness for large storage pantry shelving.
 - .1 Finish: Clear stain
 - .5 Edge banding: Melamine (MCP) all exposed edges (for melamine shelving).
- .8 Kitchen Casework Cutting Drawer
 - .1 Butcher block: 38 mm thick solid maple.
- .2 Canteen Display Case: Fabricate caseworks to AWMAC custom grade supplemented as follows:
 - .1 Furring, blocking, nailing strips, grounds and rough bucks and sleepers:
 - .1 S2S is acceptable.
 - .2 Board sizes: "Standard" or better grade.
 - .3 Dimension sizes: "Standard" light framing or better grade.
 - .2 Casework bodies (ends, divisions, and bottoms):
 - .1 Melamine (MCP): 19 mm thickness; colour to be determined by Contract Administrator.
 - .2 Veneer Core Plywood: 16 mm thickness
 - .1 Face: B-White rotary cut

- .2 Back: 2-White rotary cut.
- .3 Base:
 - .1 Fir plywood marine base, 19 mm thickness.
- .4 Drawers: Fabricate doors to AWMAC custom grade supplemented as follows:
 - .1 Sides and Bottoms:
 - .1 Veneer Core Plywood: 16 mm thickness
 - .1 Face: B-White rotary cut
 - .2 Back: 2-White rotary cut.
 - .2 Fronts:
 - .1 Melamine (MCP): 19 mm thickness;
 - .1 Provide 2 colours; Colours to be determined by Contract Administrator.
 - .2 Edge banding: Melamine (MCP) all exposed edges.
 - .3 Backs: 6 mm acrylic complete with counter-sunk, flathead, slot, nickel plated screw.
 - .5 Glass window: In accordance with Section 08 80 00 – Glazing.
- .3 Janitor Casework: Fabricate shelving to AWMAC custom grade supplemented as follows:
 - .1 Wall Applied Plywood:
 - .1 G1S Douglas Fir plywood:
 - .1 Thickness: 16 mm
 - .2 Finish: Clear stain
 - .2 Shelving:
 - .1 G2S Douglas Fir plywood:
 - .1 Thickness: 19 mm
 - .2 Finish: Clear stain
 - .3 Backing/Lining:
 - .1 G1S Douglas Fir plywood:
 - .1 Thickness: 16 mm
 - .2 Finish: Clear stain
- .4 Wall panels in public areas: Fabricate caseworks to AWMAC custom grade supplemented as follows:
 - .1 Veneer core plywood panelling:
 - .1 Face: B-White, rotary cut,
 - .2 Back: 4-natural, rotary cut
 - .3 Thickness: 16 mm
 - .4 Finish: Clear stain
- .5 Jams/Trims in Public Areas: Fabricate caseworks to AWMAC custom grade supplemented as follows:
 - .1 Veneer core plywood trim:
 - .1 Face: B-White, rotary cut,
 - .2 Back: 2-White, rotary cut

- .3 Thickness: 16 mm
- .4 Finish: Clear stain
- .6 Counter Wood Edge in Skate Change, Gymnasium, MPR and South Lobby at Office:
Fabricate caseWorks to AWMAC custom grade supplemented as follows:
 - .1 Solid Birch, thickness as indicated.
- .7 Benches:
 - .1 Bench seats: 89 mm thick laminating stock in accordance with Section 06 18 00 – Glued-Laminated Construction.
- .8 Countertops: Plastic laminate on 2-ply19mm (38 mm total) particle board core in accordance with Section 06 47 00 – Plastic Laminate finishes.
 - .1 Modesty panels: Plastic laminate on 19mm particle board core in accordance with Section 06 47 00 – Plastic Laminate finishes.
- .9 Hardware:
 - .1 Door and Drawer rolls, hinges, slides, locks, pulls, knobs shelf rest, standards, rods track shall be in accordance with CAN/CGSB-69.25-M90/ANSI/BHMA A156.9 and Section 08 70 05 – Cabinet and Miscellaneous Hardware.

2.6 FABRICATION

- .1 Set nails and countersink screws apply wood filler to indentations, sand smooth and leave ready to receive finish.
- .2 Shop install cabinet hardware for doors, shelves and drawers. Recess shelf standards unless noted otherwise.
- .3 Shelving to cabinetwork to be adjustable unless otherwise noted.
- .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 Comply with NEMA LD 3, Annex A.
- .9 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.
- .10 Form shaped profiles and bends as indicated, using post forming grade laminate to laminate manufacturer's instructions.

- .11 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.
- .12 Apply laminate backing sheet to reverse side of core of plastic laminate Work.
- .13 Apply laminated plastic liner sheet to interior of cabinetry where indicated.

Part 3 Execution

3.1 EXAMINATION

- .1 Verify the adequacy and proper location of any required backing or support framing.
- .2 Verify that Mechanical, Electrical, Plumbing, and other building components affecting Work in this Section are in place

3.2 INSTALLATION

- .1 Do architectural woodwork to Quality Standards of the Architectural Woodwork Manufacturers Association of Canada (AWMAC), except where specified otherwise.
 - .1 Installation shall conform to the AWS Grade of the items being installed.
- .2 Install prefinished millwork at locations shown on drawings. Position accurately and secure in place, level, plumb and square.
- .3 Fasten and anchor millwork securely. Provide heavy duty fixture attachments for wall mounted cabinets.
- .4 Use draw bolts in countertop joints.
- .5 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.
- .6 Apply water resistant building paper over wood framing members in contact with masonry or cementitious construction.
- .7 Fit hardware accurately and securely in accordance with manufacturer's written instructions.

3.3 INSTALLATION LAMINATES

- .1 Install Work plumb, true and square, neatly scribed to adjoining surfaces.
- .2 Make allowances around perimeter where fixed objects pass through or project into laminated plastic Work to permit normal movement without restriction.
- .3 Use draw bolts and splines in countertop joints. Maximum spacing 450 mm oc, 75 mm from edge. Make flush hairline joints.

- .4 Provide cutouts for inserts, grilles, appliances, outlet boxes and other penetrations. Round internal corners, chamfer edges and seal exposed core.
- .5 At junction of laminated plastic counter back splash and adjacent wall finish, apply small bead of sealant.

3.4 ADJUSTING & TOUCH UP

- .1 Before completion of the installation, the installer shall adjust all moving and operating parts to function smoothly and correctly.
- .2 All nicks, chips, and scratches in the finish shall be filled and retouched. Damaged items that cannot be repaired shall be replaced.

3.5 CLEANING

- .1 Clean millwork and cabinet Work inside cupboards and drawers, and outside surfaces.

3.6 PROTECTION

- .1 Protect millwork and cabinet Work from damage until final inspection.

END OF SECTION

Part 1 General

1.1 REFERENCES

- .1 American National Standards Institute (ANSI)
 - .1 ANSI 208.1, Particleboard.
 - .2 ANSI A208.2, Medium Density Fibreboard (MDF) for Interior Applications.
- .2 Canadian General Standards Board (CGSB)
 - .1 CAN/CGSB-71.20, Adhesive, Contact, Brushable.
- .3 Canadian Standards Association (CSA International)
 - .1 CSA O112, Standards for Wood Adhesives.
 - .2 CSA O121, Douglas Fir Plywood.
 - .3 CSA O151, Canadian Softwood Plywood.
 - .4 CSA O153, Poplar Plywood.
- .4 National Electrical Manufacturers Association (NEMA)
 - .1 NEMA LD3, High Pressure Decorative Laminates.
- .5 Canada Green Building Council (CaGBC)
 - .1 LEED Canada Reference Guide for Green Building Design and Construction
 2009

1.2 SUBMITTALS

- .1 Submit manufacturer's printed product literature, specifications and data sheet.
- .2 Submit duplicate samples of joints, edging, cutouts and postformed profiles.
- .3 Provide maintenance data for laminate Work for incorporation into maintenance manual.
- .4 Submit manufacturer's instructions.

1.3 QUALITY ASSURANCE

- .1 Provide Certificate of Quality Compliance upon completion of fabrication.
- .2 Provide Certificate of Quality Compliance upon satisfactory completion of installation.

1.4 DELIVERY, STORAGE, AND HANDLING

- .1 Deliver, handle, store and protect materials of this section in accordance with Section 01 61 00 - Common Product Requirements.
- .2 Maintain relative humidity between 25 and 60% at 22°C during storage and installation.

1.5 WASTE MANAGEMENT AND DISPOSAL

- .1 Separate and recycle waste materials in accordance with Section 01 74 19 – Waste Management and Disposal.
- .2 Place materials defined as hazardous or toxic waste in designated containers.
- .3 Ensure emptied containers are sealed and stored safely for disposal away for public.
- .4 Use chemical hardeners that are non-toxic, biodegradable and have zero or low VOC's.
- .5 Dispose of surplus chemical and finishing materials in accordance with Federal, Provincial and Municipal regulations.

Part 2 Products

2.1 MATERIALS

- .1 Acceptable Manufacturer: Formica Corp., 10155 Reading Road, Cincinnati, OH. 45241 (513-786-3400) or approved equal in accordance with B7.
- .2 Decorative Plastic Laminate: Manufacturers standard and custom decorative surface papers with melamine resins, bonded under heat and pressure to kraft paper backing sheet with phenolic resins.
- .3 Laminated plastic for countertops to NEMA LD 3.
 - .1 Type: General purpose.
 - .2 Grade: 12 (HGP)
 - .3 Size: 0.9 mm thick
 - .4 Surface burning characteristics: In accordance with ASTM E84.
 - .5 Finish: Matte
 - .6 Colour: to be Formica 6613-58 White Ellipse.
 - .7 Edging: 3mm PVC edge banding. Colour to be determined by Contract Administrator from manufacturers standard colour selection chart.
- .4 Particleboard core: to ANSI 208.1, sanded faces, of thickness indicated.
- .5 Laminated plastic adhesive: urea resin adhesive to CSA O112.5 contact adhesive to CAN/CGSB-71.20 resorcinol resin adhesive to CSA O112.7 polyvinyl adhesive to CSA O112.4 two component epoxy thermosetting adhesive.
- .6 Sealer: water resistant sealer on glue acceptable to laminate manufacturer.
- .7 Sealants: Silicone based material to CGSB 19-GP-22M.
- .8 Draw bolts and splines: as recommended by fabricator.

2.2 SUBSTITUTIONS

- .1 Refer to Section B7 – Substitutes of Bid Opportunity 748-2013.

2.3 FABRICATION

- .1 Comply with NEMA LD 3, Annex A.
- .2 Obtain governing dimensions before fabricating items which are to accommodate or abut appliances, equipment and other materials.
- .3 Ensure adjacent parts of continuous laminate Work match in colour and pattern.
- .4 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 3000 mm. Keep joints 600 mm from sink cutouts.
- .5 Form shaped profiles and bends as indicated, using postforming grade laminate to laminate manufacturer's instructions.
- .6 Use straight self-edging laminate strip for flatWork to cover exposed edge of core material. Chamfer exposed edges uniformly at approximately 20°. Do not mitre laminate edges.
- .7 Apply laminate backing sheet to reverse side of core of plastic laminate Work.
- .8 Apply laminated plastic liner sheet to interior of cabinetry.

Part 3 Execution

3.1 MANUFACTURER'S INSTRUCTIONS

- .1 Compliance: Comply with manufacturer's written data, including product technical bulletins, product catalogue installation instructions, product carton installation instructions, and data sheets.

3.2 INSTALLATION

- .1 Install Work plumb, true and square, neatly scribed to adjoining surfaces.
- .2 Make allowances around perimeter where fixed objects pass through or project into laminated plastic Work to permit normal movement without restriction.
- .3 Use draw bolts and splines in countertop joints. Maximum spacing 450 mm oc, 75 mm from edge. Make flush hairline joints.
- .4 Provide cutouts for inserts, grilles, appliances, outlet boxes and other penetrations. Round internal corners, chamfer edges and seal exposed core.

- .5 At junction of laminated plastic counter back splash and adjacent wall finish, apply small bead of sealant.

3.3 PROTECTION

- .1 Cover finished laminated plastic veneered surfaces with heavy kraft paper or put in cartons during shipment. Protect installed laminated surfaces by approved means. Do not remove until immediately before final inspection.

3.4 CLEANING

- .1 Perform cleaning after installation to remove construction and accumulated environmental dirt.
- .2 Perform care and cleaning with NEMA LD 3, Annex B.
- .3 Remove traces of primer, caulking, epoxy and filler materials; clean doors and frames.

END OF SECTION