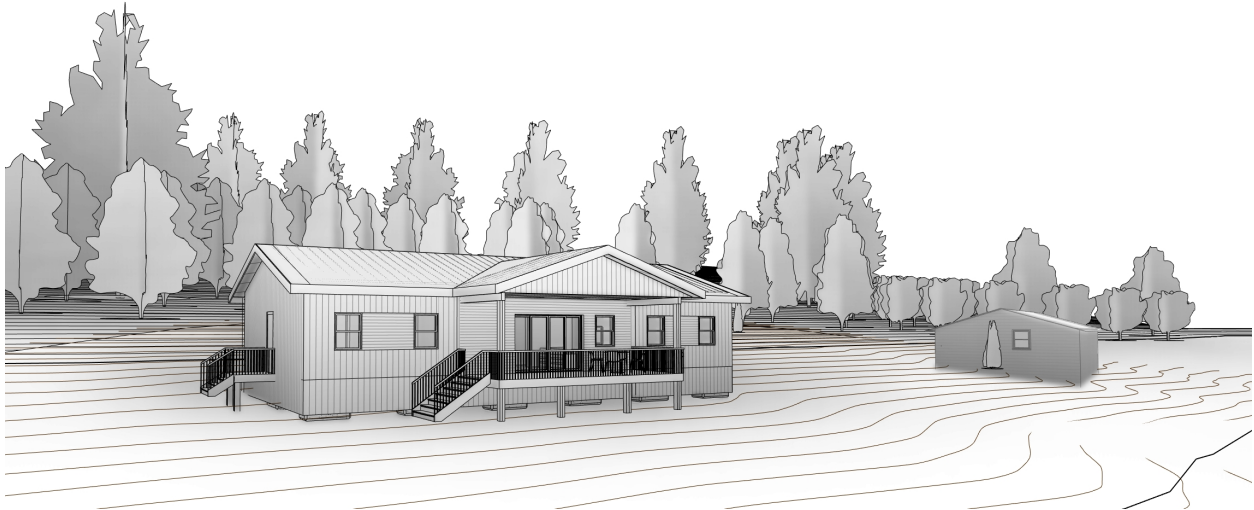


PROJECT MANUAL

**BABINE FENCE SITE
NEW STAFF BUILDING**

**BULKLEY NECHAKO, BC
REQUISITION F1700-195680/A**

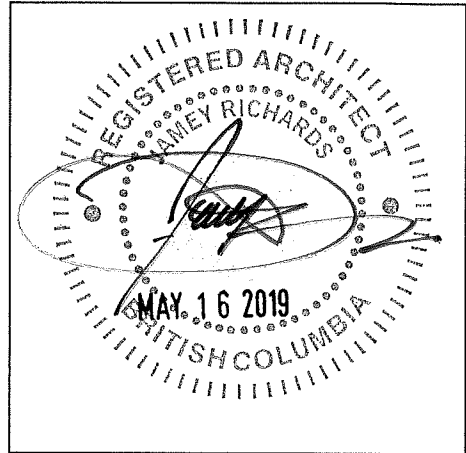


**ISSUED FOR TENDER
MAY 2019**

SEALS AND SIGNATURES

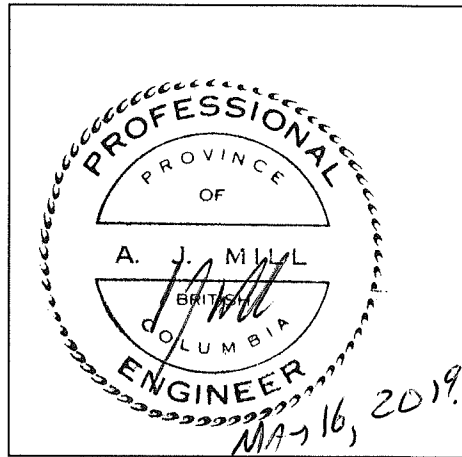
ARCHITECT

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Contact: Jamey Richards



STRUCTURAL
ENGINEER

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1.0 General

.1 The requirements of the Instructions to Bidders, General Conditions, Supplementary General Conditions, all Sections of these specifications, Drawings, Addenda, and Revisions shall govern the entire work. They form a part of each Contract, Section and Division and shall be consulted in detail for instructions pertaining to the work.

.2 All work shall be carried out in accordance with the National Building Code of Canada, current edition, and all other provincial and local codes, standards or bylaws applicable to this project.

.3 Project Summary:

This project comprises of the construction of a wood frame residence building at the Babine Counting Fence, located at KM 60 of FSR4000 in Bulkley Nechako. Best access is via the Babine Lake Road from Smithers. As per the drawings, the residence building is an approx. 1800sqft wood frame building, built on grade with a lock block foundation. This project also includes installing all specified utilities in the package and tying into the existing infrastructure on site.

Bidders can visit the site prior to submitting a tender for this work and to make inquiries or investigations necessary to become acquainted with the site. Although the site is not fully accessible to the public, visitors can see the entire site from a distance from the counting fence. As there will be no scheduled site visit, bidders are to visit the site at their own convenience.

Estimated completion to be twenty (20) weeks upon Award of Contract.

2.0 Contractor's Use of Site

.1 Do not unreasonably encumber site with materials or equipment.

.2 Move stored products or equipment which interfere with operations of Engineer or other contractors.

.3 Obtain and pay for use of additional storage or work areas needed for operations.

.4 Maintain reasonable access.

3.0 Codes and Standards

.1 Perform work in accordance with National Building Code of Canada 2015 edition, and any other code of provincial or local application provided that in any case of conflict or discrepancy, the more stringent requirements shall apply.

.2 Meet or exceed requirements of specified standards, codes and referenced documents.

- 4.0 Setting out the Work**
- .1 Verify dimensions, elevations, grades boundaries shown on drawings and required by the work, and report any errors and inconsistencies to the Departmental Representative before starting work; starting work shall imply that the Contractor has verified them and found them to be correct, and any additional costs arising out of any rectifications shall be borne by the Contractor.
 - .2 All other grade lines, levels and bench marks shall be established and maintained by Contractor who shall be responsible for same.
 - .3 The building, grid lines and elevations shall be set out by a qualified surveyor.
 - .4 As work progresses, layout walls, partitions, ceilings and openings as a guide to all trades.
- 5.0 Existing Conditions**
- .1 Inspect surfaces and conditions (including temperature and moisture) before commencing work and report defects to the Departmental Representative. No work to commence until conditions are acceptable. Commencement of work will indicate acceptance of surfaces and conditions.
- 6.0 Location of Equipment and Fixtures**
- .1 Location of equipment, fixtures and outlets indicated or specified are to be considered as approximate.
 - .2 Locate equipment, fixtures and distribution systems to provide minimum interference and maximum usable space and in accordance with manufacturer's recommendations for safety, access and maintenance. General contractor to coordinate truss layout with ceiling equipment access and clearance requirements.
- 7.0 Concealed Services**
- .1 Ensure that pipes, conduits, service lines and ducts in finished areas, are concealed in chases behind furring, in floor and ceiling spaces, concrete, or below grade, or as otherwise approved by the Departmental Representative. Any additional pathways, furring areas or chases required to complete this work that are not shown on the dwgs but required by the project will need to be and approved by the Departmental Representative.
- 8.0 Existing Services**
- .1 Where work involves breaking into or connecting to existing services, carry out work at times directed by governing authorities, with minimum of disturbance to pedestrian and vehicular traffic.
 - .2 Before commencing work establish location and extent of services in the area of work and notify Departmental Representative of findings.

- .3 Submit and obtain approval from Departmental Representative for any shutdown or closure of active service of facility. Adhere to approved schedule and provide notice to affected parties.
- .4 Where unknown services are encountered immediately advise Departmental Representative and confirm findings in writing.
- .5 Remove abandoned service lines within 2 m of structures. Cap or otherwise seal lines at cut-off points as directed by the Departmental Representative.
- .6 Record locations of maintained, re-routed and abandoned service lines.

9.0 Protection of Work and Property

- .1 The Contractor and their Subcontractors shall adequately protect their work and adjoining work at all stages of the operations and shall maintain the protection until their work is completed. They shall remove and replace at their own expense any work and materials damaged due to inadequate protection being provided.
- .2 The Contractor and their Subcontractors shall protect surfaces of completed Work exposed to view from staining, disfigurement and all other damage by restriction of access or by use of physical means suitable to the material and surface location.
- .3 The Contractor and their Subcontractors shall give constant close supervision to weather barriers, air and vapour barriers, roofing materials, and waterproofing membranes following their installation, during the time they are temporarily protected or exposed, to ensure that no damage occurs to them before completion of the building.
- .4 During construction, the Contractor will, where necessary, provide warning signs, lighting, railings and barricades for the protection of all workers, Consultants and Departmental Representative.
- .5 The Contractor will, where necessary, provide barricades to protect trees, shrubs and landscaping from construction activities.
- .6 Ensure no part of structure or building component is overloaded during construction such that elastic strength limits might be exceeded or concealed damage may occur. Any damage and any claims resulting from such overload shall be made good at the expense of the Contractor or Subcontractor involved. No load-bearing member shall be cut, drilled or sleeved without the consent of the Departmental Representative.
- .7 Weather protection: At all times provide protection against weather, rain, wind, storms, UV, or heat to maintain all work, materials, apparatus and fixtures free from injury or damage. Remove all snow, ice and frost as may be required for the proper protection and/or prosecution of work. At end of day's

- work, all areas likely to be damaged shall be protected. Take all necessary precautions to allow continuous work throughout contract period.
- .8 Protection against fire: Take special precautions against fire and comply fully with requirements of Authorities having Jurisdiction and Insurance Authorities. Maintain and enforce all regulations imposed and required to secure such protection. Maintain clear emergency exit paths for personnel at all times.
 - .9 Combustible building refuse: All broken forms or other combustible refuse shall be removed from building and disposed of daily. Packing cases shall be immediately removed from building. Open fires within structure are prohibited. No combustible materials or supplies shall be stored in areas where combustible forms are in place. Building material storage should be limited to completely fireproof areas. No fires or burning of construction refuse, or burying, shall be allowed on site without prior permission of the owner, and when applicable, only under permit from the local Fire Prevention Authorities.
 - .10 Free burning gas flares shall not be used within building or temporary enclosures around work areas. Temporary heat shall be provided by approved construction heating devices with completely enclosed combustion chambers vented to exterior and carefully located clear of all combustible materials.
 - .11 Welding, cutting, plumber's torches, tar kettles, etc., or other devices of open flame type shall be used only under strict supervision after all combustible material adjacent has been removed or safely covered. During welding or cutting, a watchman with an extinguisher shall be posted for the duration of work and thirty minutes after to guard against fire by spark or hot metal. All glass adjacent to weld or cutting areas shall be protected to avoid scar by spark.
 - .12 Gasoline, oils and other volatile liquids must be kept outside, to be brought into the building in quantities as needed. Such storage shall be in a well-ventilated location, well removed from all open heating and lighting devices. Particular attention must be given to housekeeping in oil storage locations to eliminate spillage and accumulation of oily wastes. Provide approved waste and safety cans and dispensing pumps. Store paint and/or oil covered rags in covered metal containers.
 - .13 Provide adequate ventilation for paint spray operations, or other applications using volatile or toxic materials or gasses. Open flame and smoking must be prohibited in these areas. Protective masks, clothing, eye protection must be worn where required by operations or regulations.
 - .14 Smoking shall be prohibited inside the workplace.
 - .15 Maintain fire extinguishers throughout all accessible locations and where available provide water and hose facilities keeping pace with the construction. Access for heavy fire fighting

equipment to the building site shall be provided at the start of construction and maintained to completion. Access to available street fire hydrants, temporary or permanent stand pipes and other such fire fighting equipment must be maintained at all times to the satisfaction of the authorities having jurisdiction.

- .16 Disposal of waste or volatile materials such as oil, paint thinners or mineral spirits into waterways or sewers is not permitted. Follow published guidelines and laws for federal, provincial and municipal waste management practices.
- .17 As building is enclosed there is inclination to use available areas for storage. Obtain prior approval from the Departmental Representative, observe all reasonable precautions in arranging storage and provide maximum protection possible.

10.0 Site Meetings

- .1 In order to ensure progress of the work on and off the site, in accordance with the construction progress schedule, the Contractor or the Departmental Representative, shall periodically call project meetings. Subcontractors may attend meetings as required. The Contractor shall give 72 hours notice of any meeting requiring the Departmental Representative's presence.
- .2 The Contractor shall establish a location for the project meetings of sufficient size and comfort to accommodate all parties concerned.
- .3 The Contractor shall record minutes of meetings and distribute to all parties within seven (7) days of meeting.

11.0 Site Safety Committee

- .1 The Contractor will establish and chair the site safety committee in accordance with WCB regulations and requirements.
- .2 All Subcontractors shall provide to the Site Safety Committee, copies of WHMIS 'material safety data sheets' for any 'controlled product' in accordance with WCB regulations. This information shall be provided prior to the product being used on site.
- .3 The Subcontractor intending to use a controlled product shall be responsible for worker education, training, product labeling, etc. in accordance with WCB regulations.
- .4 All Subcontractors shall immediately notify the Contractor if any safety hazard or accident, apparent or suspected whether or not related to the work of this Contract.

12.0 Reference Documents

- .1 The Contractor shall provide at the site, one (1) copy of each of the following documents for general reference:
 - .1 Contract Drawings
 - .2 Specifications
 - .3 Addenda
 - .4 Reviewed Shop Drawings

- .5 Change Orders
- .6 Other Modifications to the Contract
- .7 Field Test Reports and Inspection Reports
- .8 Approved Samples
- .9 National Building Code of Canada 2015, B.C. and National Plumbing Codes, B.C. and Canadian Electrical Codes, together with all supplements, and Occupational Environment Regulations.
- .10 WCB of BC Accident Prevention Regulations
- .11 Copy of all permits issued to the Owner and the Contractor
- .2 Maintain documents in clean, dry, legible condition.
- .3 Make documents available at all times for review by Departmental Representative.

13.0 Daily Diary

- .1 The Contractor shall, from the date of commencement of the Work, maintain a careful daily record of the progress of the Work using standard diary form, with all applicable Subcontractors listed. This record shall be open for the Departmental Representative's review at all reasonable times.
- .2 The diary shall record all pertinent data such as:
 - .1 Daily weather conditions, including maximum and minimum temperatures.
 - .2 Subsurface conditions encountered during excavation.
 - .3 Commencement, progress and completion of various portions of the work.
 - .4 Dates of visits or inspections by the Owner, government, authorities, inspectors, testing agencies, utility companies and any other visitors to the site.
 - .5 Record of work force employed.
 - .6 Information required by Contractor or Subcontractors
 - .7 Materials or information causing delay.
 - .8 Actions or events causing delay.
 - .9 Clarifications or questions, and answers given.

14.0 Permits and Regulatory Requirements

- .1 Refer to General Condition 10.2.
- .2 The Contractor shall obtain and pay for all other permits, licenses or certificates and pay all monthly fees in connection with the permits required for the Work.
- .3 The contractor shall apply and pay BC Hydro Temporary Power Connection Charges for all fees required for temporary power, temporary water, and temporary telephones at the site. Refer to Section 01500.
- .4 BC Hydro permanent power connection charges will be paid by the Owner. The contractor shall arrange for, and coordinate this power connection with BC Hydro, and shall remove and relocate and/or replace any existing hoarding as required to accommodate the connection of the permanent power supply.

- .5 Notify the appropriate authorities of intention to carry out operations in the vicinity of a utility or structure at least two weeks prior to the commencement of such operation and obtain approval for access to any operations carried out on adjacent public and private property.

15.0 Relics & Antiquities

- .1 Relics and Antiquities and items of historical or scientific interest found on site or in buildings to be demolished shall remain property of the Fort Babine Nation. Protect such articles and request directives from the Departmental Representative.

16.0 Request For Information (RFI)

- .1 The Contractor shall satisfy themselves that an RFI is warranted by undertaking a thorough review of the Contract Documents to determine that the claim, dispute, or other matters in question relating to the performance of the Work or the interpretation of the Contract Documents cannot be resolved by direct reference to the Contract Documents. In such cases the contractor shall describe in detail this review on a Departmental Representative approved RFI form as part of the RFI submission. Where the RFI form does not provide sufficient space for complete information to be provided thereon, attach additional sheets as required. RFI submittals that lack detailed review description, or where the detail provided is, in the opinion of the Departmental Representative, insufficient, shall not be reviewed by the Departmental Representative and shall be rejected.
- .2 RFIs shall be submitted sufficiently in advance of affected parts of the work so as not to cause delay in the performance of the Work. Costs resulting from failure to do this will not be by the Owner.
- .3 RFIs shall be submitted only to the Consultant and Departmental Representative.
- .4 RFIs shall be submitted and logged by the General Contractor with a single numbering system. RFI's submitted directly by Trade Contractors or Suppliers shall not be accepted.
- .5 Allow 5 Working days for review of each RFI by the Departmental Representative. When the RFI submittal is received by Departmental Representative before noon, review period commences that day; when RFI submittal is received by Departmental Representative after noon, review period begins on the next Working Day.

17.0 General Notes for Drawings

- 1. All labour, materials, and products to comply with the requirements of the **National Building Code of Canada (NBCC 2015)** and all other applicable codes, standards, by-laws and regulations.

2. All dimensions are to face of concrete, face of studs, centerline of studs or to gridlines, unless noted otherwise.
3. Building to meet requirements of barrier free design per **NBCC 2015** accessibility design standards or **CAN/CSA-B651** (latest version).
4. Building code, safety standards, and regulatory statute references on drawings are for authority review purposes only. The presence of the aforementioned notes does not release the contractor and all others involved in the construction of the project from their legal and statutory responsibility to conform to the law of the land in constructing and the construction of the building.
5. Notes "refer to structural", "refer to mechanical", "refer to electrical", "refer to civil", on drawings are not meant to imply coordination or delegate responsibility for an item to a specific trade or supplier. These notes refer only to other drawings where more information on the item may be obtained. Coordination & delegation of supplying / installing a material / product is the prerogative of the contractor (construction manager) or a local union jurisdiction.
6. Drawings are not to be scaled for dimensions.
7. Architectural drawings are to be read in conjunction with Consultants' drawings, contract documents and specifications.
8. See geotechnical report for soil/foundation requirements including drainage below slab, drain tile, backfills, etc.
9. Verify all dimensions, quantities & site conditions with drawings prior to commencing any work, notify the architect of any discrepancies.
10. In the event of any discrepancies in the drawings, specifications, or contract documents, the more stringent requirement shall apply.
11. For conditions not explicitly shown, the contractor shall immediately request clarifications from the architect.
12. The contractor is responsible for the correct location & siting of all proposed structures and facilities. All form locations are to be verified by a BCLS before casting concrete. Contractor to notify the Departmental Representative of any conflicts/discrepancies encountered on the plans regarding actual site conditions.
13. The contractor is responsible to arrange and pay for all compaction testing associated with building and site improvements including building foundations and slabs on grade, exterior concrete retaining walls, exterior concrete flat works, crushed stone pathways and asphalt road works to demonstrate conformance to the specified design and geotechnical requirements. Qualified performing testing agencies to be pre-approved by the geotechnical engineer of record.

14. The contractor shall obtain & pay for all permits / certificates & pay all monthly fees in connection w/ the permit required for the work.
15. The contractor shall apply and pay BC Hydro temporary power connection charges for all fees required for temporary power, temporary water, and temporary telephones at the site, and ongoing supply charges during construction.
16. BC Hydro permanent power connection charges will be paid by the owner. The contractor shall arrange for, and coordinate this power connection with BC Hydro, and shall remove and relocate and/or replace any existing hoarding as required to accommodate the connection of the permanent power supply.
17. Contractor to provide temporary facilities as follows:
 - 17.1. Sanitary facilities for work force in accordance with governing regulations.
 - 17.2. Maintain minimum temperature of 10°C or higher as soon as finishing work commences.
 - 17.3. Temporary security fencing shall be provided during construction, conforming to insurance policies.
18. Contractor to provide submittals including, but not limited to: prefabricated trusses and wood products, millwork, washroom accessories, flooring, paint, flashings, exterior & Interior finishes, exterior siding, doors & hardware, windows, roofing, equipment, firestopping systems and any other submittals required by structural, mechanical, electrical & civil Consultants.
19. Contractor to provide mock-ups including the installation of self-adhesive membrane around window/door openings.
20. The contractor is responsible for all material testing, concrete, asphalt and soils density testing.
21. The contractor is responsible for disposal and material source separation, containers to deposit re-useable and/or recyclable materials including but not limited to: gypsum board, metals, wood, cardboard, plastics, etc. Disposal to be in accordance with local regulations.
22. Glass design notes:
 - 22.1. Structural design of glass & framing of glass for building including windows, glass doors, canopies, guards & skylights in accordance with **CAN/ CGSB-12.20** and to allow for deflection of span / 360 at midspan of structural members U.N.O.
 - 22.2. Submittals: contractors/suppliers shall provide submittals for windows, doors, overhead doors, hardware, structural & miscellaneous steel, signage, concrete tilt-up panels, light fixtures, electrical and mechanical equipment.
 - 22.2.1. Shop drawings sealed and signed by supplier's specialty structural engineer indicating all design loads, member sizes

- and connection details, plus loads imposed on the primary structure.
- 22.2.2. Supplier's specialty structural engineer shall submit letters of assurance b & c-b to Departmental Representative & perform required field reviews.
- 22.3. Submit all proposed connections to building structure to Departmental Representative for concept review and approval.
- 23. Signage design notes:
 - 23.1. Signage supplier is responsible for structural design of all signage attached to building structure and all free-standing signage structures in accordance with:
 - 23.1.1. **NBCC 2015** for gravity loads & lateral loads due to wind & earthquake.
 - 23.1.2. Design loads as specified on the structural drawings.
 - 23.2. Refer to building owner for all details, dimensions, finishes, etc. Of required signage and to conform to local bylaws.
 - 23.3. Submit all proposed connections to building structure to Departmental Representative for concept review and approval.
 - 23.4. Shop drawings:
 - 23.4.1. Shop drawings sealed and signed by supplier's specialty structural engineer indicating all design loads, member sizes and connection details, plus loads imposed on the primary structure.
 - 23.4.2. Supplier's specialty structural engineer shall submit letters of assurance b & c-b to Departmental Representative & perform required field reviews.
- 24. Structural and non-structural elements:
 - 24.1. Consultant is not responsible for the structural design and the design of non-structural or secondary structural elements and their connections to the primary structural elements. These elements include but are not limited to:
 - 24.1.1. All glazed systems including window & skylight units, storefront / curtainwall systems, canopies and guardrails.
 - 24.1.2. Elevators, escalators, lifts and dock levelers.
 - 24.1.5. Moveable curtains / partitions and door / overhead door systems, storage shelving & racking systems.
 - 24.1.6. Manufactured stairs, roof access ladders & roof access scuttles, louvers & grilles.

- 24.1.7. Toilet partitions, washroom equipment, gymnasium equipment, chalkboards, whiteboards & tackboards.
- 24.2. Structural design of non-structural elements is to be carried out by the specialty structural engineer(s) retained by the contractor/supplier(s) of the non-structural elements as per **NBCC 2015** for gravity & lateral loads.
- 24.3. Shop drawings:
 - 24.3.1. Submit to Departmental Representative a complete set of shop drawings at least three weeks prior to fabrication.
 - 24.3.2. Shop drawings to indicate design assumption, design load, load imposed to building structure & connection details.
 - 24.3.3. Shop drawings must be signed & sealed by BC professional engineer for structural design.
 - 24.3.4. Specialty engineers to submit letters of assurance b & c-b to Departmental Representative and perform the necessary field reviews.
 - 24.3.5. Structural design of the support and seismic restraint of mechanical, plumbing & electrical equipment and systems to be carried out by the specialty engineer(s) retained by the contractor and/or supplier(s) in accordance with **NBCC 2015**. Submit shop drawings & letters of assurance b and c-b to respective mechanical & electrical engineers of record for review.
 - 24.3.6. Design connections to minimize torsion and/or torsion loading to primary structure.
- 25. Fire separations to continue above rated dropped ceilings to maintain integrity of separation between rated floors and to extend to meet underside of roof deck or to provide a fire rated ceiling.
- 26. Any penetration into fire rated membrane ceiling shall be framed and covered w/ 2 layers of 15.9mm type X GWB and any penetration into fire rated wall/ceiling shall be covered w/fire rated enclosure to avoid discontinuity of the fire ratings. All ducts in fire rated walls/ceilings shall be equipped w/ fire dampers.
- 27. All penetrations through fire separations and fire rated assemblies are to be fire stopped as per **NBCC 2015**.
- 28. Horizontal concealed spaces within the roof assembly of combustible construction shall be separated into compartments not more than 300 m² w/ no dimension more

- than 20 m, fire blocking materials for compartmentalization & fire stops to be as per **NBCC 2015**.
29. Windows and doors to comply with **NBCC 2015**.
 30. Glass in doors, sidelights and panes lower than 20 mm to be tempered safety glass unless noted otherwise.
 31. Glass in fire separations not more than 1 hr. To be fixed wire glass assembly unless noted otherwise.
 32. All windows that may be opened to be equipped with heavy duty commercial hardware at all levels.
 33. Exit doors to be readily openable when traveling in direction of exit path without requiring keys or special knowledge and shall be single release operation as per **NBCC 2015**.
 34. Exit doors to be painted in contrasting color to surround and to other doors in floor area. Hardware to exit doors and vestibule doors to be roughened. Exit door hardware to be lever type with single release operation.
 35. All doors in fire separations to be provided with ULC rated self- closers and latching devices.
 36. Doors equipped with closers to have a closing period of at least 3 seconds when door is in a barrier-free path of travel and will open in the direction of exit travel under a force of not more than 90 n applied to the door release hardware.
 37. Interior / exterior door hardware to be Schlage, Weiser or approved alternate.
 38. All hardware to be brushed stainless finish or matching finish unless noted otherwise.
 39. All stairs treads / risers / nosings to be as per **NBCC 2015**.
 40. Provide handrails as required (min. 865 mm and max. 965 mm above nosings) for all interior stairs & all exterior stairs having more than three risers. Handrails to be continuous, and to extend horizontally not less than 300 mm beyond the top and bottom of the stairway or ramp. See also item 41 below for additional requirements for handrails used as a guard on stairs. The clearance between a handrail and any surface behind it shall be not less than 50 mm or 60 mm if the surface behind the handrail is rough or abrasive. Handrails shall be continuously graspable along their entire length and shall have a circular cross section with an outside diameter not less than 30 mm & not more than 43 mm.
 41. Provide guards where shown on drawings and where adjacent grade or floor level is 610mm or more. Unless noted otherwise, minimum height of guards to be 1070 mm. Unless noted otherwise guards to be non-climbable and constructed to not allow passage of a 100 mm diameter sphere. Guards to be designed to resist loads listed in **NBCC 2015**. Min. Guard height to be 920 mm in stair flights and 1070 mm around landings.

42. Refer to finish schedules in conjunction with wall type schedule and interior elevations for type and extent of all interior finishes.
43. Damp proof / water proof all exterior concrete retaining walls below grade (except free standing retaining walls) U.N.O.
44. Exterior pathways, stairs and ramps to be concrete pavement c/w control joints and to have a California broom finish to the extents shown on site, civil and landscape plans, unless noted otherwise.
45. Provide class a, b, or c roofing as required.
46. Roofing manufacturer shall provide a written & signed full roofing system warranty issued in the name of the owner certifying the performance for a non-prorated ten-year period, starting from the date of the substantial performance.
47. Provide min. 1/300 ventilation area of insulated area of roof attic.
48. Any exterior vented areas/cavities shall be protected with bug screens such as wall cavities and soffits.
49. Wood blocking at soffits to have holes at 1/3 of span to assure continuous capability of air movement.
50. Air barrier joints are to be continuously sealed and structurally supported and must meet **NBCC 2015**.
51. All penetrations through exterior air barrier (plywood) shall be covered w/ min. 3" (76mm) peel & stick membrane on each side.
52. Use gasketed electrical boxes on exterior walls and seal to poly vapor barrier.
53. Plywood panels for installation of electrical equipment shall be pressure impregnated fire retardant treated plywood with ULC label.
54. All exterior pressure treated (PT) wood shall be preserved by sodium borate U.N.O.
55. All exterior wood to be primed and sealed on all six sides before installation, exposed surface to receive 2 finish coats, stain & UV protection. (total 3 coats). Provide the architect w/ a sample for review/approval before commencing the work.
56. All floors intended to receive a tile / slate finish are to have a recess of max. 13 mm.
57. Furniture is not included in the contract unless noted otherwise.
58. Provide a standard 10-year roofing contractors association of British Columbia (RCABC) roof guarantee.

18.0 General Structural Notes

GENERAL

1. The following notes are minimum requirements unless noted otherwise on the structural drawings prepared by DAVID NAIRNE & ASSOCIATES LTD [DNA].
2. Read structural drawings in conjunction with all other consultants' drawings, contract documents and specifications.
3. Check and verify all dimensions, quantities and site conditions with architectural drawings before commencing with any work. Notify architect of any discrepancies.
4. The latest edition of the standards and codes referenced in these notes and on the Structural Drawings shall apply.
5. Do not construct from these drawings unless marked "Issued for Construction".
6. In the event of discrepancies in the specifications, drawings or contract documents, the more stringent requirement shall apply.
7. Notes and details specified on the plans and details take precedence over those in General Structural Notes, except for minimum requirements.
8. For conditions not explicitly shown, Contractor shall immediately request clarifications from the Structural Engineer.
9. Contractor to submit to DNA in writing all proposed alternate products, materials and structural systems for review at least 4 weeks prior to the start of construction.

FIELD REVIEW

1. Contractor is responsible for pre-inspecting the work and confirming completeness and conformity with the Structural Contract Documents prior to field review by DNA.
2. Notify DNA at least 72 hours in advance for field review of the following:
 - a) Concrete reinforcement: Prior to each concrete pour
 - b) Structural steel: Prior to concealment
 - c) Wood framing: Prior to concealment
3. Work found to be incomplete or deficient may require additional field reviews at additional cost to the Contractor.
4. Our field review consists of a periodic review of the structural work only. It is not carried out for the Contractor's benefit, and it does not make DNA guarantors of the Contractor's work. The Contractor is responsible for his own quality control and shall perform the work with good workmanship in the conformance with the Contract Documents.

SUBMITTALS AND SHOP DRAWINGS

1. Contractor is responsible for overall coordination of sub-trades.
2. Submittals are items required by the Contract Documents to be submitted by the General Contractor, such as (but not limited to) request for payment, progress reports, shop drawings, manufacturer's literature on equipment, concrete mix designs, concrete test results, aggregate gradation reports, schedules, etc.
3. Suppliers shall prepare for DNA and submit to the General Contractor 4 complete sets of Shop Drawings for general compliance review prior to fabrication. Each sheet shall be sealed and signed by a Professional Engineer registered in the Province of British Columbia, who will be the Specialty Structural Engineer responsible for the integrity of his/her design.
4. DNA will NOT review or assume responsibility for such matters as dimensions or quantities or the Contractor's safety measures or methods of construction.
5. Incomplete sets of Shop Drawings, or Shop Drawings prepared using reproductions of DNA Structural Drawings will NOT be accepted.
6. Shop drawings and other submittals of pre-engineered or proprietary structural elements shall clearly indicate type, position, and connection to elements of the Primary Structural System as well as the criteria and loads used for the design.
7. Submittals must be reviewed by the General Contractor prior to DNA's review.
8. Where required by the following sections of these General Structural Notes, proprietary products, connections and other structural elements which have been designed by Specialty Structural Engineers shall be inspected by those engineers at the appropriate stage of construction, at which time observations and deficiencies in the work shall be reported in writing to the SER (DNA).
9. Where required by the following sections of these General Structural Notes, each Specialty Structural Engineer shall submit to DNA Letters of Assurance Schedules B and C-B, or S-B and S-C, sealed and signed, clearly outlining areas of responsibility.
10. Refer to the following sections for specific Shop Drawing requirements.
11. After review, the drawings will be stamped and initialed to show one of the following:
 - NOT REVIEWED – Shows work not within Structural consultant's scope of work,
 - REVISE AND RESUBMIT – Correct and resubmit for review prior to fabrication,
 - REVIEWED AS MODIFIED – Released for fabrication after revisions noted are made.
Submit final shop drawings for DNA's records.
 - REVIEWED – Released for fabrication.

CONSTRUCTION

1. Drawings show completed structures only. Contractor is responsible for temporary bracing for all building elements against construction loading conditions and for construction erection procedures. Temporary support to be designed by a Professional Engineer registered in the Province of British Columbia in accordance with WorkSafeBC regulations and as required by local building authorities.
2. It is the sole responsibility of the Contractor to ensure that no part of the work is subjected to a load which will endanger the safety of the building or workers.
3. Protect structural work from adverse weather conditions and moisture prior to, during and after installation.
4. Contractor to compare all design drawings, dimensions and site conditions and notify DNA of any discrepancies prior to proceeding with the work.
5. Contractor to submit to DNA in writing all proposed alternate products and structural systems, including technical specifications where required, for review and approval.
6. Contractor shall review the concrete pour plan with DNA prior to construction.

STRUCTURAL DESIGN

1. The new construction for this base building has been designed by DNA in accordance with: Part 9 of the 2015 National Building Code of Canada [NBC].
2. Climatic Design Criteria:

a) Ground Snow Load (1 in 50 year)	Ss (1/50)=	3.4 kPa
Rain Load (1 in 50 year)	Sr (1/50)=	0.2 kPa
Importance Factor for Snow Load	Is =	1.0
b) 24-Hour Rain		–
c) Hourly Wind Pressure (1/10 year)	q (1/10) =	0.29 kPa
Hourly Wind Pressure (1/50 year)	q (1/50) =	0.37 kPa
Importance Factor for Wind Load	Iw =	1.0
Wind Internal Pressure Category	Category =	2
3. Minimum Design Live Loads:

Area	Occupancy/Notes	Specified Load
Main floor	Living Areas	1.9 kPa (40 psf)
Corridors	> 1200 (4 ft) wide	4.8 kPa (100 psf)
Exits and stairs		1.9 kPa (40 psf)
Basic roof snow load	+ build up where applicable	2.1 kPa (44 psf)
Handrails and Guards		Per Part 9 of the Building Code

4. **Seismic Data:**
- | | | | | | |
|---|---------------|------------|----------|---------|-------|
| a) Ground Motions | Sa(0.2) | = 0.113 | Sa(0.5) | = 0.089 | |
| | Sa(1.0) | = 0.059 | Sa(2.0) | = 0.040 | |
| | Sa(5.0) | = 0.019 | Sa(10.0) | = 0.006 | |
| b) Peak Ground Acceleration | PGA | = 0.049 | | | |
| c) Site Class B | F(0.2) | = 1.64 | F(0.5) | = 2.47 | |
| | F(1.0) | = 2.81 | F(2.0) | = 2.90 | |
| | F(5.0) | = 2.93 | F(10.0) | = 2.52 | |
| d) Importance Factor | le | = 1.0 | | | |
| e) Ductility | NS direction: | Rd | = 3.0 | Ro | = 1.7 |
| | EW direction: | Rd | = 3.0 | Ro | = 1.7 |
| f) Lateral Seismic force (factored) | V | = 0.05 x W | | | |
| g) Plywood diaphragms are assumed to be ductile. | | | | | |
5. **See drawings for specific loads and loading conditions. Specialty Engineers to be responsible for identifying specific loading conditions within their scopes of work.**

SITE PREPARATION AND FOUNDATIONS

1. **Building foundations have been designed in accordance with information provided from Department of Fisheries and Oceans. At the discretion of the client no Geotechnical investigation was undertaken due to the requirement that ground soil was not disturbed.**
2. **Site Preparation:**
 Contractor to prepare site in accordance with Geotechnical Report and notify Geotechnical Engineer for field review of site preparations prior to foundation construction.
3. **Protect native soils from softening and frost. Remove all softened or frost damaged soils prior to placement of reinforcement and concrete. Protect bearing soils from freezing after footing construction.**
4. **Excavations to be free of water prior to and during concrete placement. Provide adequate means of removing water from excavations and trenches.**
5. **If building site is underlain by methane generating soils, refer to other consultant's report and drawings for design of methane control measures.**
6. **If building site is underlain by compressible soils, the building foundation design is based on the site being preloaded with mineral fill to induce primary consolidation settlement of the underlying compressible soils prior to foundation construction.**
7. **Foundation design:**
 - a) **Bearing soil:** Gravel
 - b) **Serviceability Limit State bearing capacity** 100kPa (2000 psf)
 - c) **Factored Ultimate Limit State bearing capacity** - (-)
 - d) **Minimum footing:**
 - i) 750x750x1500 FLAT TOP LOCK BLOCK
 - e) **Variable soil conditions that result in lower allowable soil bearing conditions may require revision to foundation design.**

8. No minimum frost cover determined, some frost heave to be expected.
9. Building design based on the following long-term settlements estimated by the Geotechnical Engineer:
 - a) Total settlements: = -
 - b) Differential settlements: = -
 - c) Angular distortion = -/-
10. Provide formwork for full specified depth of footings and provide level footing base to allow uniform clear cover to reinforcement and to prevent sloughing of adjacent soil into footing form.
11. Loose or wet sub-base under footings may require removal, sub excavation and replacement with structural fill. Refer to Geotechnical Report for details.
12. Compact fills in maximum lifts and to densities as noted in the Geotechnical Report or as directed by the Geotechnical Engineer, and test for compaction at sufficient intervals to verify conformance.
13. Provide a minimum of 150mm (6") of well graded sand and gravel below all interior and exterior slabs-on-grade on prepared sub-base. Compacted to approval of Geotechnical Engineer.
14. Securely tie down all anchor bolts and embedded items to formwork prior to concrete pour.
15. Centre footings under columns/walls unless noted otherwise.
16. Retaining wall and basement wall backfill requirements:
 - a) Backfill material behind retaining walls to be compacted, clean free-draining granular backfill.
 - b) Install drainage system behind wall designed by others.
 - c) Do not backfill behind retaining walls until concrete has achieved a minimum strength of 25 MPa.
 - d) Do not backfill behind basement walls, or other walls to be connected to the floor or roof structure, until after completion of the floor and roof system to approval of DNA.

CONCRETE

1. Specifications:
 - a) Standards: CAN/CSA A23.1, CAN/SCA A23.2, CAN/CSA A23.3
 - b) Cement: Portland Cement Type G.U. in accordance with CSA A3001
 - c) Coarse Aggregate: 19mm (3/4") maximum U.N.O.
 - d) Mix Design to Alternative 1 per Table below:

Locations	28 – Day Compressive Strength, MPa	W/C Ratio	Air Entrain %	Slump (mm)	Exposure Class	Cement Type	See Notes
Interior Footings	25	0.60	1 to 4	80 ± 30	N	G.U.	N/A
Exterior Footings	25	0.55	4 to 7	80 ± 30	F-2	G.U.	N/A
Foundation walls (Exposed)	25	0.55	4 to 7	80 ± 30	F-2	G.U.	N/A
Skim coat	30	0.50	-----	80 ± 30	N	G.U.	N/A
Exterior slab-on-grade – pedestrian traffic	32	0.45	5 to 8	80 ± 30	C-2	G.U.	2(A), 3
Ramp slab-on-grade – vehicular traffic	35	0.40	5 to 8	80 ± 30	C-2	G.U.	2(B), 3
Exterior slab-on-grade – vehicular traffic	32	0.45	5 to 8	80 ± 30	C-2	G.U.	2(A), 3
Interior slab-on-grade – vehicular traffic	25	0.55	-----	80 ± 30	C-4	G.U.	N/A
Interior floor topping	25	0.45	-----	80 ± 30	N	G.U.	2(A), 7
Interior walls & columns/pedestals	25	0.60	-----	80 ± 30	N	G.U.	N/A
Exterior walls & columns/pedestals	25	0.55	4 to 7	80 ± 30	F-2	G.U.	N/A

Notes: Where referenced in notes column of the table above.

1. Slab-on-grade in exposed interior areas to be wet cured.
2. Slab and Floor Finish Classifications as per CSA A23.1:

Class	Description	Straight edge Tolerance	F _F	F _L	SWi
A	Conventional (smooth)	± 8mm	20	15	5mm
B	Conventional (non slip)	± 12mm	15	15	8mm
C	Moderately Flat	* ± <u>3mm</u> *	30	20	3mm

See CSA A23.1 for finishing procedure.

3. Sawcut crack control joint as soon as possible within 12 hours of slab finishing. See Architectural and Structural drawings for locations and details.
4. Hand tool crack control joint. See Architectural drawings for locations.
5. Add polypropylene fibres to concrete mix at plant to reduce non-structural cracking. Fibres to be Fibermesh 'MD' as manufactured by Fibermesh Division, Synthetic Industries, at an application rate of 0.9 kg/m³ to 1.8 kg/m³. Actual application rate and concrete mix design to be reviewed by Fibermesh and concrete supplier.
6. KRYTON KIM ADMIXTURE: Concrete strength noted is minimum required for structural design; higher strengths may be required based on KIM mix requirements. Minimum Portland cement content shall be 250 kg/m³. Maximum W/C ratio shall be 0.45. KIM waterproofing admixture to be added into the concrete mix at the time of batching at 2% by weight of the cementitious materials. Contact Kryton International Incorporated at 604-324-8280 for application instructions and specifications.
7. Max aggregate size of 3/8" (10mm) for masonry grout and concrete topping.

- e) **Admixtures:** Admixtures to approval of DNA. Calcium Chloride not allowed. Admixtures to conform to requirements of ASTM C260 (air entrainment) and ASTM C494 (chemical).
 - f) **Testing:** Test concrete as per CSA A23.1 and A23.2: Min one test of three cylinders per Class per day. Additional tests required per A23.1 and A23.3. Additional field-cured cylinders required in hot and cold weather conditions.
 - g) **Grout:** Non-shrink cementitious grout, minimum 30MPa at 3 days and minimum 55MPa at 28 days.
2. Concrete to be well consolidated with mechanical vibrator.
 3. Protect concrete from all harmful substances and adverse weather conditions during construction.
 4. No embedded items, including blockouts, nailers, conduits, ducts, pipes, sleeves, etc., are permitted in concrete formwork unless specifically authorized by DNA.
 5. All concrete work, including footings, walls, slabs, curbs, and topping, shall be reinforced except skimcoats unless otherwise noted.
 6. Unless otherwise noted, provide minimum bottom reinforcing in slabs as below:

<u>Slab thickness</u>	<u>Temperature reinforcing each way</u>
150 (6")	10M @ 300 (12")
175 (7")	10M @ 250 (10")
200 (8")	15M @ 450 (18")
225 (9")	15M @ 400 (16")
250 (10")	15M @ 400 (16")
 7. **Submittals:** Contractor shall pay for and provide the following submittals:
 - a) Mix designs
 - b) Concrete test results

REINFORCING STEEL

1. All work shall meet the requirements of the Canadian Standards Association [CSA] and the American Society for Testing and Materials [ASTM].
2. Deformed bars shall conform to CSA G30.18 Grade 400 MPa (Fy=60,000 psi) with:
 - a) Lapped tension splices in accordance with CAN3-A23.3 as follows:

BAR SIZE		10M	15M	20M	25M	30M	WWM
BASIC TENSION	mm	450	630	780	1290	1700	300
LAP SPLICE	(in)	(18)	(24)	(30)	(50)	(67)	(12)
FULL TENSION	mm	620	880	1090	1810	2400	—
LAP SPLICE	(in)	(24)	(36)	(43)	(72)	(94)	

- b) Detail reinforcement to stagger splices and minimize usage of splices U.N.O. on plans. Splicing of reinforcing steel shall meet the requirements of CAN3-A23.3.
- c) Horizontal reinforcement shall be continuous around corners with bends or corner bars.
- d) All concrete shall be reinforced. Concrete not explicitly detailed shall have the following minimum reinforcement:
 - i) Columns:
 - 1% of gross area of section.
 - 15M ties spaced at least 1/2 least dimension of column.
 - ii) Beams:
 - 0.35% of gross area of section.
 - 15M ties spaced at 1/2 depth of beam.
 - iii) Slabs and Walls:
 - 0.2% of gross area of section each way and perimeter beam as detailed.
- e) Maintain concrete cover to reinforcing as follows when not explicitly detailed:

STRUCTURAL MEMBER		EXPOSURE TO WEATHER	
		EXPOSED	NOT EXPOSED
For beams, girders, columns and piles: Principal reinforcement, No. 35 and smaller	mm (in)	50 (2)	40 (1 1/2)
For ties, stirrups and spirals:	mm (in)	40 (1 1/2)	30 (1 1/8)
For slabs, walls and joists, No. 20 and smaller:	mm (in)	30 (1 1/8)	20 (3/4)
For shells and folded plates, No. 15 and smaller:	mm (in)	30 (1 1/8)	15 (9/16)
For bars with diameter d larger than listed above, cover shall be min. 50mm (and need not be > 50mm)		1.5 d	1.0 d
The ratio of the cover to the nominal maximum aggregate size shall be minimum:		1.5 d	1.0 d
Formed surface exposed to ground or weather:	mm (in)	50 (2)	
When cast against, and permanently exposed to, earth:	mm (in)	75 (3)	
Tilt-up panels		See f) below	

The cover for a bundle of bars shall be the same as that for a single bar with an equivalent area.

f) Maintain concrete cover to reinforcing of tilt-up panels as follows:

CLEAR COVER TO MAIN REINFORCING		
OUTSIDE FACE OF PANEL	mm (in)	25 (1)
INSIDE FACE OF PANEL	mm (in)	20 (3/4)
EDGE OF PANEL	mm (in)	50 (2)

CLEAR COVER TO TIES & STIRRUPS		
INSIDE OR OUTSIDE	mm (in)	20 (3/4)
EDGE OF PANEL	mm (in)	40 (1 1/2)

3. Placement:

a) Openings in walls and slabs:

- i) Do not cut typical reinforcement at openings, but shift to each side of opening.
- ii) Provide 1 – 15M x 4'-0" LG diagonal bar 25mm (1") clear from corner of opening.
- iii) Openings ≤ 600 (24") square: Provide 2-15M each side, extending 600 (24").
- iv) Openings > 600 (24") square: Provide extra reinforcing as directed on Site by DNA.

b) Provide dowels to match size and spacing of vertical and horizontal reinforcement.

4. All reinforcement required to be welded to connection plates shall be Grade 400W (Weldable). Weld steel in conformance with CSA W186.

5. All reinforcement to be bent in the field shall be Grade 400W (Weldable).
6. Ensure all bars are securely tied and chaired to maintain specified cover and prevent displacement during concrete placement. For surfaces exposed to weather, provide non-corrosive chairs.
7. Wet doweling of reinforcement is not acceptable unless approved in advance by DNA.
8. All reinforcing steel shall be clean of substances that will affect its bond to concrete.
9. Bars damaged in the field may require replacement as directed by DNA.
10. For tension splices, no more than 50% of the bars shall be splices at any one location.
11. Where drill and epoxy reinforcing is required the following minimum embedment must be applied, unless directed otherwise in writing by DNA. Drill and epoxy with Hilti RE 500 V3 to develop reinforcing.

Reinforcing Bars	Minimum Embedment	Reinforcing Bars	Minimum Embedment
10M	240mm	20M	540mm
15M	400mm	25M	850mm

12. Provide minimum of ___ lbs of extra reinforcement (10M + 15M) to be used as directed by DNA.

STRUCTURAL STEEL, MISCELLANEOUS STEEL & CONNECTIONS

1. Fabricate and erect structural steel to CSA S-16 Division 2 certification or better.
2. Structural steel shall conform to CSA G40.21 with the following grades:
 - a) W Shapes: Grade 350W
 - b) Angles & Channels: Grade 300W
 - c) HSS: Grade 350W Class C
 - d) Plates & Miscellaneous steel: Grade 300W
 - e) Connection Bolts:
 - i) Steel to steel connections: ASTM A325
 - ii) Steel to foundation anchor bolts: ASTM A307 or A325 per drawings
 - iii) Wood connections: (interior – not exposed to moisture) ASTM A307 hot dipped galvanized to CAN/CSA – G164
 - f) Finish: One coat shop primer except embedded items, See specifications.
 - g) Pipes: ASTM A53 Grade B
3. All welding shall conform to CSA W59, W55.3 and W186 – Reinforcing Bars and shall be performed by fabricators fully certified by the Canadian Welding Bureau to the requirements of CSA W47.1.
4. Connection Design:
 - a) Code Compliance: Supplier shall design structural steel connections on the basis of "Simple Construction" in accordance with CSA S-16 and S-136 for the design loads indicated on the drawings and in accordance with Part 4 of the Building Code.
 - b) Beams: Design beam reaction for 60% of the load given in the beam load tables in Part 5 of the Commentary on CSA S-16, or for design loads indicated.
 - c) Beam Stiffeners: Provide minimum 9.5mm (3/8") thick full height stiffeners each side of web at bearing supports, brace work points, beam and column connections and as indicated/required.
 - d) Bolts: Minimum 19mm (3/4") diameter A325 or as indicated. Minimum 2 bolts per connection.

- e) **Columns:** Provide slotted shear plate beam connection through column to minimize eccentric loading to column.
 - f) **Braced Frames:** Design for connection loads as indicated. Field weld as required.
 - g) **Lateral Bracing of Column/Beam:** Design for 2% if factored axial load resisted by column/beam.
Column/Beam:
 - h) **Shear Connections:** Provide double side plates for all shear connections.
5. Supplier to confirm all dimensions and site conditions of structure prior to fabrication.
 6. Design steel trusses for design loads as indicated.
 7. Carry all columns continuous to roof framing U.N.O.
 8. **Erection Tolerances:**
 - a) **Columns:** Location shall be zero inches at base and 6mm (1/4") max. out of plumb at top.
 - b) **Exterior girts** to be accurately aligned with columns.
 9. All edges and corners of connections shall be ground smooth.
 10. Any steel subject to corrosion shall be hot dip galvanized or coated with a corrosion resistant finish to the approval of DNA. All hot dip galvanizing to be in accordance with CAN/CSA G164 U.N.O.
 11. All HSS sections shall be provided with 6mm (1/4") thick caps.
 12. **Submittals:** Supplier shall provide the following submittals (refer to the Submittals section):
 - a) Shop Drawings sealed and signed by Supplier's Specialty Structural Engineer indication design capacity of all connections.
 - b) Shop Drawings of trusses sealed and signed by Supplier's Specialty Structural Engineer indicating design capacity of all trusses and connections, truss design loads, truss reactions, member forces, lateral brace forces, deflections and any field splices.
 - c) Letters of Assurance B and C-B, or Schedules S-B and S-C.
 - d) Certificates showing that the fabricator is fully certified by the Canadian Welding Bureau.

PREFABRICATED WOOD TRUSSES

1. Design and fabricate trusses in accordance with:
 - a) Part 4 of the Building Code, CAN/CSA 086
 - b) Design loads and criteria as indicated on the Structural Drawings
 - c) Western Wood Truss Associated of British Columbia [WWTa-BC] Quality Assurance Program [QAP]
 - d) Truss Plate Institute of Canada
2. Truss Supplier's Truss Systems Engineer shall design and supply all steel connections required for:
 - a) Truss to truss connections
 - b) Truss to supporting structure, including:
 - i) Truss holdown connections to resist wind and other uplift load conditions
 - ii) Truss bearing connections to transfer gravity loads
 - c) As indicated on the Structural Drawings.

3. Truss supplier to design trusses for a maximum horizontal deflection of 25 mm and maximum vertical deflections as follows:

		MAXIMUM DEFLECTION		
TRUSS TYPE	LOAD TYPE	SPAN < 4.6m (SPAN < 15'-0")	4.6 < SPAN = 12.2m (15'-0" < SPAN = 40'-0")	SPAN > 12.2m (SPAN > 40'-0")
Roof	Snow	L/360	L/480	L/720
Roof	Total	L/240	L/360	L/480

4. Truss supplier to design bottom chord of truss for minimum live load of 0.5 kPa (10 psf).
5. Truss supplier to supply trusses with engineered wood, multiple laminations, custom joint connections, etc. as required to meet project requirements. Multiple ply trusses to be shop laminated.
6. Truss supplier shall confirm truss spacing requirements. Truss spacings noted on drawings are maximum spacing U.N.O. Contractor shall coordinate proposed truss spacings with arch, mech and elec requirements prior to truss shop drawing submission.
7. No on-site modifications to trusses are permitted unless first reviewed and approved by DNA and the Supplier's Truss System Engineer, who shall issue written instructions and repair details as required.
8. Submittals: Supplier shall provide the following submittals (refer to the Submittals section):
- a) Shop Drawings sealed and signed by Supplier's Truss Systems Engineer indicating:
 - i) Truss layout showing locations of trusses, bearing conditions, and all design loads, including snow drift, unbalanced snow diagrams and wind loading.
 - ii) Detailed design/fabrication of each truss, clearly showing design loads, member forces, deflections, camber details, lateral bracing, etc. Details shall be drawn in three dimensions.
 - iii) Truss erection instructions and details for all required temporary and permanent lateral bracing of truss members, including anchorage details of permanent bracing to roof/diaphragm and/or shear walls.
 - iv) Truss shipping sheet indicating quantity of all truss types, connections, accessories, species, sizes and stress grades.
 - b) Site inspection report by the Supplier's Truss Systems Engineer for the erection of the trusses.
 - c) Schedules S-B and S-C for design and installation of prefabricated wood trusses by Supplier's Truss Systems Engineer.

ENGINEERED WOOD PRODUCTS

1. Engineered Wood Products (EWP) and related steel connections to be designed and supplied by Trus Joist, or equal approved, in accordance with:
- a) Part 4 of the Building Code (including concentrated loads per 4.1.5.10),

- b) and the design loads and design criteria as indicated on the Structural and Mechanical Drawings and specifications.

The EWP are to form a complete floor and/or roof framing system compatible with the supporting structure.

2. Supplier to confirm all EWP (TJI, PSL, LSL, LVL) specified on the drawings for depth, type and spacing for COMMERCIAL USE for the design loads and conditions. Trus Joist Ltd. to confirm and coordinate locations of all openings and concentrated loads due to structure and/or equipment.
3. Supplier to design EWP in accordance with Building Code vibration criteria and the following maximum deflection requirements:

AREA	LIVE LOAD	TOTAL LOAD
ROOF	L/360	L/240
FLOOR	L/480	L/360

4. Supplier to review nailing requirements provided in the Roof and Floor Diaphragm Schedules and Structural Wall Framing Schedules and confirm that supplied engineered wood products are suitable for the specified nailing requirements.
5. Submittals: Supplier shall provide the following submittals (refer to the Submittals section):
- a) Shop Drawings sealed and signed by Supplier's Specialty Structural Engineer indicating:
- i) Layout showing location of EWP, bearing conditions, design loads including drift diagrams and relevant dimensions.
 - ii) Design fabrication details of each member clearly showing design loads, member forces, deflections, camber, bearing details, lateral bracing, etc.
 - iii) Connection details showing design load capacity and installation details.
 - iv) Storage and installation/erection instructions and details.
 - v) Quantity of all member types, connections and accessories on a shopping sheet.
 - vi) All bracing, blocking and framing accessories required for installation.
- b) Supplier's Specialty Structural Engineer's site inspection report for EWP erection.
- c) Schedules S-B and S-C.
5. No on-site modifications, including holes, notches, reduced bearing lengths, etc., shall be made to the EWP without first being approved by DNA, the supplier's Specialty Structural Engineer, and the EWP manufacturer. Any reinforcing required due to on-site modifications shall also be approved by these same parties.

POST INSTALLED CONCRETE ANCHORAGES

1. Post installed anchors shall be used only where specified on structural drawings. The installation of post installed anchors for missing or misplaced cast in-place anchors shall be approved by the engineer of record.
2. Products
- a) Adhesive used to install reinforcing steel and threaded rods in existing concrete shall be:
- i) Hilti HT-HY 200-R Adhesive System, U.N.O. or,

- ii) **Hilti HIT-RE 500 V3 Adhesive System.**
 - iii) **DEWALT AC200+ Adhesive System.**
 - iv) **DEWALT/ Powers Fasteners Pure110+ Adhesive System.**
 - b) **Mechanical anchors to be as specified on drawings.**
 - c) **A written request for the use of alternate products, with applicable technical specifications, including a current ICC-ES report, must be submitted to, and approved by DNA prior to construction.**
 - d) **Reinforcing steel and threaded rod anchors shall be as specified in the reinforcing steel notes.**
 - e) **Any anchor subject to corrosion shall be hot dip galvanized, stainless steel, or coated with a corrosion resistant finish to the approval of DNA. All hot dip galvanizing to be in accordance with ASTM A123 and CAN/CSA G164 U.N.O. and all stainless steel to be in accordance with ASTM A193, A320 and F593 U.N.O..**
3. **Documentation & Training**
- a) **The Contractor shall have copies of product literature and installation guides on site.**
 - b) **Prior to construction, the Contractor shall arrange for manufacturer on-site training of all installers for all post-installed anchor types to be used.**
4. **Execution**
- a) **All anchors shall be installed in strict accordance with the manufacture's printed installation instructions (MPII) in conjunction with the edge distance, spacing and embedment depth as indicated on the structural drawings. Special attention is drawn to the minimum temperature requirements.**
 - b) **Installation of adhesive anchors is not permitted within 21 days of concrete placement unless prior authorization is obtained from DNA.**
 - c) **Anchor capacity is dependent upon spacing between adjacent anchors and proximity of anchors to edge of concrete. Install anchors in accordance with spacing and edge clearances indicated on the drawings and in the manufacturers literature.**
 - d) **Drilling of holes through existing reinforced steel in concrete is prohibited. If encountered, abandon hole location and start a new hole away from reinforcing steel locations. Patch all unused holes.**
5. **Testing**
- a) **On site load testing of 10% of all post-installed anchors shall be carried out by an independent testing laboratory, retained by the Contractor, in conjunction with the manufacturer's representative.**
 - b) **If more than 10% of all post-installed anchors fail to achieve the specified torque or proof load, all anchors of the same diameter and type shall be tested, unless otherwise instructed by Engineer on record.**
 - c) **As an alternative to anchor testing, the Contractor may retain a Material Consultant to carry out field reviews of all post-installed anchor installations.**
6. **Submittals**
- a) **Submit to DNA copies of all installers' training certificates prior to installation of post-installed**
 - b) **Where testing is required, submit to DNA certified test reports, showing compliance with specified performance characteristics and physical properties.**
 - c) **Where the Contractor retains a Material Consultant to perform field reviews of anchor installations instead of testing, submit to DNA Schedules S-B and S-C.**

STRUCTURAL WOOD FRAMING

1. Lumber grading to NLGA standard grading rules for Canadian lumber.
 Lumber Grades (U.N.O. on structural drawings):

Member	Species	Grade	Moisture Content	Comments
Studs	SPF	No.1/2	S-Dry	Full height to underside of roof/floor U.N.O. Finger-jointed vertical installation for non-load bearing walls only.
Wall Plates	D.Fir	No.1/2	S-Dry	No wane
Joists/Rafters	SPF	No.1/2	S-Dry	–
Built-up Beams	SPF	No.1/2	S-Dry	Full length laminations
Wall Sheathing	DFP	SHG	–	Plywood
Roof Sheathing	DFP	SHG	–	T&G Plywood
Floor Sheathing	DFP	SHG	–	T&G Plywood
Posts	PSL or LSL		S-Dry	Full height U.N.O.
Pole Columns – Int	Northern (min 10 rings/in)			Seasoned Alaskan – 'Yellow Cedar'
Pole Beams – Int	Northern (min 10 rings/in)			Seasoned Alaskan – 'Yellow Cedar'
Pole Columns – Ext	Northern (min 10 rings/in)			Red Cedar
Pole Beams – Int	Northern (min 10 rings/in)			Red Cedar
Pole Beams/Columns	D.Fir (min 8 rings/in)			As noted on drawings
Notes: 1. See Engineered Wood Products section. 2. For Pressure Treated plywood see Pressure Treated Lumber section.				

2. General Framing (U.N.O. on structural drawings):
- Nails:** All nails used for structural framing shall be common nails unless otherwise approved by DNA.
 - Headers:** 2–2x10 S–Dry for all non–load bearing partition walls. 89x240 (3 1/2"x9 1/2") LSL for maximum 1800 (6'–0") opening for all load bearing walls.
 - Partitions:** Double joist under partition walls parallel to joist span.
 - Moisture:** Use Ethafoam gasket under all wood bearing on concrete or steel.
 - Wet Service:** Use Pressure Treated lumber for all framing exposed to air or in contact with moisture.
 - Top Plates:** Stagger splice location and lap minimum 1200 (48"), 3 rows of 75 long (3") common nails at 150 (6") on centre.

- g) **Point Loads:** Transfer down to foundations with built-up studs, beams, or solid blocking.
- h) **Openings:** For openings wider than joist spacing, provide double joist/rafter each side of opening in floor/roof and solid block between.
- i) **Bolts:** Interior (Not exposed-to-view): Minimum 19mm (3/4") \emptyset A307 Zinc Plated.
 Exterior & Exposed to View: Minimum 19mm (3/4") \emptyset A307 HDG
 Pre-drilled bolt holes shall have a diameter maximum 2mm larger than bolts.
 Provide standard cut washers between all bolts bearing against wood.

j) **Plywood:** Schedule:

Location	Plywood	Common Nail	Edges	Interior
Roof	16 (5/8")	63 (2 1/2")	⊕ 150 (6") unblocked	⊕ 300 (12")
Floor	19 (3/4")	63 (2 1/2")	⊕ 150 (6") unblocked	⊕ 250 (10")
Walls	12 (1/2")	63 (2 1/2")	⊕ 150 (6") blocked	⊕ 300 (12")

- k) **Built-up Beams:**
 - i) Maximum 3 ply laminations unless noted otherwise.
 - ii) Built-up beams to be top loaded only unless noted otherwise.
 - iii) Fasten laminations together with nails that penetrate 3/4 of the way through the last piece. Space nails as follows:
 - 2x6, 2x8: 2 rows ⊕ 300 (12") o/c longitudinal
 - 2x10: 3 rows ⊕ 300 (12") o/c longitudinal
 - 2x12: 4 rows ⊕ 300 (12") o/c longitudinal
 All rows to be spaced at 75 (3") o/c.
- l) **Built-up Columns:**
 - i) Built-up columns to be part of stud wall and have plywood shearing on one side minimum. Maximum 5 ply U.N.O.
 - ii) Fasten laminations together as follows:
 - Up to 3 ply: 2x4: 1 row of nails ⊕ 200 (8") o/c.
 - 2x6: 2 rows of nails ⊕ 200 (8") o/c.
 - 4 and 5 ply: All sizes: 1 row of 16mm (5/8") \emptyset bolts ⊕ 600 (24") o/c and 150mm (6") max from top and bottom.
 - iii) Nails shall penetrate 3/4 of the way through the last piece and shall be driven from alternate sides of built-up member.
- m) **Backframing:** Repair, replace or reinforce wood framing damaged or removed by subtrades as directed on site by DNA.

3. Double check and re-tighten all bolted connections prior to enclosing wood framing.

4. **Deliver, Storage, and Handling:**
 - a) All materials shall be stored level on the site and shall be raised off the ground, stacked using separating spacers, and covered with a waterproof material, in the case of wrapped members the wrapping shall be slit on the underside to prevent accumulation of condensation.
 - b) No material shall have a moisture content higher than 19% at the time of installation. Suspect material will be replaced at the discretion of the engineer. Cost shall be borne by the contractor.
 - c) Members that will be exposed to view in the finished building shall be handled using nylon or fabric slings to prevent surface damage.
5. **Fabrication:** Splicing and jointing in locations other than shown on the drawings shall not be permitted.
6. **Moisture Content (MC):**
 - a) S-Dry: Kiln-dry lumber to a MC of 19% or less at time of concealment.
 - b) Seasoned: Air-dry lumber undercover to a MC of 19% over a period of at least one year.
7. **Connections:**
 - a) **Supplier:** Simpson Strong Tie
 - b) **Design:** Prefabricated hot-dipped galvanized steel framing connections to transfer vertical and lateral loads based on maximum capacity of connected wood members. Special connections to be custom designed and fabricated by supplier for design loads specified on the drawings and certified by a British Columbia registered Professional Engineer.
 - c) **Location:** Framing connections are typically require at, but not limited to, the following locations:

LOCATION	CONNECTION TYPE
Joist/rafter to flush beam	Top mount hanger or Face mount hanger
Flush beam to beam	Top mount hanger or Face mount hanger
Column to beam	Post to beam
Column on beams/foundations	Post base saddle
Note: Use of pressure blocking is NOT PERMITTED.	

8. Non-structural (siding, posts, etc.) shall comply with Part 9 of the Building Code and as shown on Architectural drawings.
9. Bonded connections between wood members and steel members shall use 'Powerfill Epoxy Filler and Bonding Agent' by 'Industrial Formulators', tel 1-888-277-8050.

END of SECTION

PART 1 - GENERAL

- 1.1 General** .1 The “General Conditions” and “Supplementary General Conditions shall form part of their section.
- 1.2 Shop Drawings** .1 The term “shop drawings” means drawings, diagrams, illustrations, schedules, performance charts, brochures and other product data which are to be provided by the Contractor to illustrate details of a portion of the Work.
- .2 Indicate materials, methods of construction and attachment or anchorage, erection diagrams, connections, explanatory notes and other information necessary for completion of Work. Where articles or equipment attach or connect to other articles or equipment, indicate that such items have been coordinated, regardless of the Section under which the adjacent items will be supplied and installed. Indicate cross-references to design drawings and specifications.
- .3 Adjustments made on shop drawings by the Departmental Representative are not intended to change the Contract Price. If adjustments affect the Value of Work, state such in writing to the Departmental Representative prior to proceeding with the Work.
- .4 The Contractor shall review all Shop Drawings prior to submission to the Departmental Representative.
- .5 The Contractor shall be responsible for verifying all site dimensions and field conditions and quantities.
- .6 All units of measurement are to be metric.

PART 2 – SUBMITTAL

- 2.1 Submittals** .1 Submit shop drawings and product data sheets for each requirement requested in this Section and other specification Sections or as the Departmental Representative may reasonably request with date, revision number, project name, supplier and all applicable standards. At sole discretion of Departmental Representative shop drawing procedures may be permitted to be submitted in original electronic PDF format.
- .2 Submit samples and colour charts as required or as directed by the Departmental Representative. The samples and colour charts shall be examples of the manufactures’ latest products and in their standard colour range, unless specifically noted.
- .3 If upon review by the Departmental Representative, no errors or omissions are discovered or if only minor corrections are made, shop drawings or product data sheets will be returned to the Contractor and fabrication and installation of work may proceed. If shop drawings are rejected, a noted copy will be returned and resubmission of corrected shop drawings, through the same procedure indicated above, shall be

- performed before fabrication and installation of work may proceed.
- .3 Make changes in shop drawings as the Departmental Representative may require, consistent with Contract Documents. When resubmitting, notify the Departmental Representative in writing of any revisions other than those requested.
 - .4 The Contractor's responsibility for errors and omissions and for deviations in submission is not relieved by the Departmental Representative's review of the submission.
 - .5 Submit shop drawings and/or product information including, but not limited to, the following items and other items as the Departmental Representative may reasonably require:
 - .1 Structural Steel
 - .2 Miscellaneous Metals
 - .3 Prefabricated Wood Trusses
 - .4 Proprietary Wood Products
 - .5 Architectural Woodwork
 - .6 Damproofing, Waterproofing, Air/ Vapour Barriers
 - .7 Custom Cabinets, Vanities, Countertops and Millwork
 - .8 Metal Doors/ Frames, Wood Doors/ Frames, and Access Doors/Panels
 - .9 Resilient Flooring Finish, Floor Systems, Wall Base
 - .10 Paint Systems
 - .11 Exterior Cementitious Wall and Metal Wall Cladding Materials and Assemblies
 - .12 Exterior Vinyl Soffit
 - .13 Flashing Materials Walls, Windows, Roofing, Material Transitions and Special Conditions
 - .14 Asphalt Shingle Roofing Assemblies
 - .15 Sealants and Caulking including colour
 - .16 Roof Drains and Rain Water Leaders
 - .17 Firestopping and Smoke Seals
 - .18 Vinyl Windows, Flashings and Trim
 - .19 Finish Hardware
 - .20 Signage
 - .21 Fire Safety Plan
 - .22 Washroom Accessories
 - .23 Specialties
 - .24 Roller Blinds
 - .25 Plumbing Fixtures
 - .26 Mech Equipment, Fans, Louvers, Grilles, Dampers
 - .27 Light Fixtures and Electrical Equipment.
 - .28 Fire Extinguishers/ Cabinets
 - .6 In addition to the above noted items submit shop drawings and/or product information as required by the Sub-Consultants Drawings and Specifications.
 - .7 In addition to the above noted items submit material samples as required elsewhere.

- 2.2 Field Review Items**
- .1 The Contractor shall request a Field Review by the Departmental Representative including, but not limited to, the following and other items as the Departmental Representative may reasonably require prior to concealment:
 - .1 Dampproofing and Waterproofing
 - .2 Insulation above and below grade; below slab; at roof
 - .3 Sheathing / Weather Barrier/ Air Barrier
 - .4 Vapour Barrier above grade wall and roof
 - .5 Vapour Barrier under slab
 - .6 Excavation, Bearing Capacity of the Soil, Compaction of the Engineered Fill, Backfill, and any additional review requirement as per Geotechnical Report / drawings.
 - .7 See Structural, Mechanical, Electrical, Civil drawings and specification for their field review requirement
 - .2 In addition to the above noted items, request Field Reviews prior to concealment as required by the Sub-Consultants' Drawings and Specifications.
- 2.3 Samples & Mock-Ups**
- .1 The Contractor shall prepare field samples and mock-ups including, but not limited to, the following items:
 - .1 Installation of the Building Paper/ Self-Adhesive Membrane around Window/Door Openings and Wall Flashings, penetrations, or special conditions
 - .2 Installation of prefinished metal breakshapes, closures and flashings around Window/Door Openings.
 - .3 Installation of Metal and Wood Wall Cladding and Wall Panels including associated and representative prefinished breakshapes and flashings at top and bottom of walls, flashings at material transitions, and inside and outside building corners.
 - .4 Installation of wood soffit slat and panel materials.
 - .2 Construct field samples mock-ups at locations acceptable to the Departmental Representative.
 - .3 Generally, field samples mock-ups can be constructed to form part of the finished work.
 - .4 Construct each sample or mock-up to include the work of all trades required to finish work.
 - .5 Reviewed samples or mock-ups will become the standard for workmanship and material assembly against which installed work will be checked on project.
 - .6 All samples or mock-ups which will not become part of the finished work shall be retained on-site for use as directed by the Departmental Representative, to test construction or cleaning procedures, etc., until completion of the Work.
 - .7 Where applicable, samples will be returned to the Contractor upon completion of the Work.

END of SECTION

PART 1 - GENERAL

- 1.1 General** .1 The “General Conditions” and “Supplementary General Conditions shall form part of their section.
- 1.2 Related Work** .1 Refer to every technical section for waste management and disposal.
- 1.3 Definitions**
- .1 Waste Audit (WA): relates to projected waste generation. Involves controlled separation of waste.
 - .2 Waste Reduction Workplan (WRW): a written report, which addresses opportunities for reduction, re-use or recycling of materials.
 - .3 Materials Source Separation Program (MSSP): consists of a series of ongoing activities to separate re-usable and recyclable waste material into material categories from other types of waste at point of generation.

PART 2 - MATERIALS

- 2.1 Materials** .1 Before project start-up, prepare Materials Source Separation Program and provide containers to deposit re-usable and/or recyclable materials of the following:
- .1 Gypsum board
 - .2 Metals
 - .3 Wood
 - .4 Roofing Material
 - .5 Plastics
 - .6 Other materials as indicated in technical sections

PART 3 - EXECUTION

- 3.1 Materials Source Separation**
- .1 Implement Materials Source Separation Program for waste generated on project in compliance with approved methods and as approved by Departmental Representative.
 - .2 Locate containers in locations, to facilitate deposit of materials without hindering daily operations.
 - .3 Locate separated materials in areas that minimize material damage.
- 3.2 Diversion of Materials**
- .1 Create a list of materials to be separate from the general waste stream and stockpiled in separate containers, to the approval of the Departmental Representative and consistent with applicable fire regulations.
 - .2 Clearly indicate materials in each container.
 - .3 Provide instructions on disposal practices.

**3.3 Storage, Handling
and Application**

- .1 Do work in compliance with Waste Reduction Workplan.
- .2 Handle waste materials not re-used, salvaged, or recycled in accordance with appropriate regulations and codes.
- .3 Materials in separated condition: collect, handle, store on site, and transport off-site to an approved and authorized recycling facility.
- .4 Materials must be immediately separated into required categories for re-use or recycling.
- .5 Provide Departmental Representative with receipts indicating quantity and type of material sent for recycling.
- .6 Provide Departmental Representative with receipts indicating quantity of material delivered to landfill.
- .7 Unless specified otherwise, materials for removal become the Contractor's property.
- .8 On-site sale of salvaged/recyclable material is not permitted.

END of SECTION

PART 1 - GENERAL

- 1.1 General** .1 The "General Conditions" and "Supplementary General Conditions" shall form part of this section.
- 1.2 Related Requirements Specified Elsewhere** .1 Particular requirements for inspection and testing to be carried out by testing laboratory designated by Departmental Representative are specified under various Sections.
- 1.3 Appointment and Payment** .1 The Departmental Representative will appoint and will pay for services of testing except for the following which are to be paid for by the Contractor:
- .1 Inspection and testing required by laws, ordinances, rules, regulations, or orders of public authorities. (including video inspection and air testing of storm and sewer pipes, pressure testing of water pipes) to demonstrate compliance.
 - .2 Inspection and testing performed exclusively for Contractor's convenience.
 - .3 Testing, adjustment and balancing of conveying systems, mechanical and electrical equipment and systems.
 - .4 Mill tests and certificates of compliance.
 - .5 Tests specified to be carried out by Contractor under the supervision of Departmental Representative.
- .2 Independent testing agencies for Soils, Backfill and Compaction, Asphalt and Concrete Testing will be conducted by a testing agency approved by Departmental Representative and paid for by General Contractor. All other testing required by each subcontractor in order to perform his work shall be provided and paid by the performing subcontractor.
- .3 Where tests or inspections by designated testing laboratory reveal work not in accordance with Contract requirements, Contractor shall pay costs for additional tests or inspections as Departmental Representative may require to verify acceptability of corrected work.
- 1.4 Contractor's Responsibilities** .1 Furnish labour and facilities to:
- .1 Provide access to work to be inspected and tested.
 - .2 Facilitate inspections and tests.
 - .3 Make good work disturbed by inspection and test.
 - .4 Provide storage on site for laboratory's exclusive use to store equipment and cure test samples.
- .2 Notify Departmental Representative sufficiently in advance of operations to allow for assignment of laboratory personnel and scheduling of test.

- .3 Where materials are specified to be tested deliver representative samples in required quantity to testing laboratory.
- .4 Pay costs for uncovering and making good work that is covered before required inspection or testing is completed and approved by Departmental Representative.

END OF SECTION

PART 1 - GENERAL

- 1.1 General** .1 The "General Conditions" and "Supplementary General Conditions" shall form part of this section.
- 1.2 Access** .1 Provide and maintain adequate access to project site.
.2 If authorized to use existing roads for access to project site, maintain such roads for duration of Contract and make good damage resulting from Contractor's use of roads.
- 1.3 Architect/Engineer's Site Office** .1 Not Required.
- 1.4 Storage Sheds** .1 Provide adequate weather tight sheds with raised floors, for storage of materials, tools, and equipment that are subject to damage by weather.
- 1.5 Sanitary Facilities** .1 Provide sanitary facilities for work force in accordance with governing regulations and ordinances.
.2 Post notices and take such precautions as required by local health authorities. Keep areas and premises in sanitary condition.
- 1.6 Power** .1 Arrange, pay for and maintain temporary electrical power supply in accordance with governing regulations and ordinances.
- 1.7 Water Supply** .1 Arrange, pay for and maintain temporary water supply in accordance with governing regulations and ordinances.
- 1.8 Heating and Ventilating** .1 Maintain minimum temperature of 10°C or higher where specified as soon as finishing work is commenced and maintained specified minimum temperatures until project handover.
.2 Maintain ambient temperature and humidity levels as required for comfort of office personnel.
- 1.9 Temporary fencing** .1 Temporary security fencing shall be provided during construction around the site conforming to insurance policies. Contractor to coordinate with Departmental Representative locations of temporary fencing.
- 1.10 Security** .1 The Contractor shall be responsible for the security of all sites and materials during the course of the work. The Contractor shall provide adequate barricades and lighting around and adjacent to any open excavation or other potentially dangerous location and of other locations specifically designated by the Departmental Representative.

END of SECTION

PART 1 - GENERAL

- 1.1 General** .1 The "General Conditions" and "Supplementary General Conditions" shall form part of this section.
- 1.2 Fires** .1 Fires and burning of rubbish on site permitted only when approved by the Environmental Monitor.
.2 If applicable, permits for burning must be obtained from the Province or Tribal Council and implemented.
.3 Where fires or burning permitted, prevent staining or smoke damage to structure or materials or vegetation which is to be preserved. Restore, clean and return to new condition stained or damaged work.
.4 Where burning is permitted, fires shall be no closer than 100 m from any building.
.5 Provide supervision, attendance and fire protection measures, including fire fighting equipment and water truck, as required by permit.
- 1.3 Archaeological Protection** .1 All Archaeological artefacts are protected, whether found on the ground surface, or buried beneath the surface. All such remains and deposits are not to be disturbed until their significance has been assessed by an archaeologist to the satisfaction of the Departmental Representative.
- 1.4 Hazardous Materials Handling and Storage** .1 Hazardous materials including, but not limited to, fuels, bitumens, cement, paints, solvents, cleaners, dust suppressants, used fuel and oil filters, and other construction materials shall be stored and handled to minimise loss and to allow containment and recovery in the event of a spill.
.2 The Contractor shall designate area(s) for the transfer and temporary storage of hazardous materials and wastes. The designated area(s) shall be used by the Contractor as a transfer and temporary storage area for potentially hazardous materials and wastes. The area(s) shall be clearly labelled and appropriately controlled.
.3 The Contractor shall maintain proper Workplace Hazardous Material Information Systems (WHMIS) labels and Material Safety Data Sheets (MSDS) for all hazardous materials used and stored on site.
.4 Discharge of waste or volatile materials, such as mineral spirits, oil or paint thinner into waterways, storm or sanitary sewers is prohibited.
.5 Discharge of water containing chlorine or other chemical compounds into waterways is prohibited.

**1.5 Special and General
Waste, Rubbish and
Garbage**

- .1 Special Waste generated in the course of the construction activities shall be handled and disposed of in compliance with the British Columbia Special Waste Regulation. As defined by these regulations, Special Wastes include, but are not limited to, such things as waste asbestos, oils, greases, lubricants, solvents, batteries, polychlorinated biphenyls (PCBs), paints and used spill cleanup materials.
- .2 When handling, storing, and removing Special Wastes, the Contractor shall maintain the following records: Inventories of types and quantities of Special Wastes generated, stored, or removed; manifests identifying Special Waste haulers and disposal destinations; MSDS and disposal certification documents.
- .3 Non-hazardous solid wastes, such as but not limited to, waste wood, asphalt, concrete, and metals shall be disposed of at an approved and licensed disposal facility in compliance with the British Columbia Waste Management Act.
- .4 The Contractor shall establish regular clean up and disposal programs so as to prevent the unnecessary accumulation of excessive solid waste and contain all garbage related to the project.

1.6 Drainage

- .1 The Contractor shall provide temporary drainage and pumping as necessary to keep excavations and site free from water.
- .2 Pumping of water containing silt in suspension into ditches, watercourses, and sewer and storm water systems is prohibited.
- .3 The contractor shall control disposal or runoff of water containing suspended materials or other harmful substances in accordance with Federal, Provincial and Municipal requirements.

**1.7 Site Clearing and
Plant Protection**

- .1 Protect trees and plants on site and adjacent properties where indicated.
- .2 Minimize stripping of topsoil and vegetation.
- .3 Contractor shall provide protective fencing at limits of clearing and maintain it through the construction process.
- .4 For the protection of the aquatic habitat provide Leave Strip to the limits shown on the drawings. Do not clear, grub, or alter grades in the proposed leave area. Feather and round grades immediately outside the leave area to meet existing adjacent grade.
- .5 Restrict tree removal to those areas designated by Engineer.
- .6 Revegetation within and adjacent to Leave Areas should be with native species appropriate to the site.

- 1.8 Equipment Operation**
- .1 The Contractor shall maintain construction equipment in good condition and free of excess oil and grease.
 - .2 Maintenance of equipment shall be confined to specific areas such that spills can be contained and collected before contaminants reach ditches, watercourses, and storm water systems.
 - .3 There shall be no discharge of wash water to ditches, watercourses or storm water systems from trucks and equipment related to concrete supply, pumping, or placing equipment.
 - .4 Waste oils and other materials related to equipment shall be removed from the site upon completion of project.
 - .5 Equipment operation shall be limited to hours acceptable to the community.
 - .6 Contractor shall have fuel absorbents on site and shall deal with any spills which should occur immediately.
- 1.9 Erosion and Sedimentation Control**
- .1 The Contractor must prepare Erosion and Sedimentation Control Plan and implement siltation control measures for all excavation to minimise siltation of ditches, watercourses and storm water systems.
 - .2 Isolate the swale site from sedimentation during construction by either use of effective erosion protection and sediment control measures or delay the excavation of 300 mm of material over the final subgrade or the swale until after all sediment producing construction has been completed.
 - .3 Siltation control shall include but not be limited to installation of silt fences and construction of sedimentation ponds and shall meet the standards described in Land Development Guidelines for the Protection of Aquatic Habitat published jointly by the BC Ministry of Environment and Department of Fisheries and Oceans. Siltation control measures shall remain in place until completion of construction. Contractor shall implement erosion and sedimentation control measures during the construction process.
 - .4 Contractor shall ensure that all works is performed to prevent release of sediment laden or hydrocarbon contaminated (e.g. oil, grease, hydraulic fluid, or fuel) water from the site boundary. This includes ensuring no water flows are pumped or channeled to bypass the sediment control facilities.
 - .5 Erosion and sedimentation control measures shall include but not be limited to retention of existing vegetation, installation of silt fences, and construction of settlement ponds. Sedimentation control measures shall remain in place until completion of construction.
 - .6 Contractor shall ensure that sediment and hydrocarbon control facilities are frequently visually inspected and repaired as necessary.

**1.10 Work Adjacent to
Drainage Courses and
Waterways**

- .1 Construction and excavation wastes, overburden, soil, or other substances deleterious to aquatic life must be disposed of or placed in such a manner so as to prevent their entry into any ditch, watercourse, or storm water system.
- .2 Operation of construction equipment in waterways without the Departmental Representative's approval and approval of Fisheries authorities is prohibited.

**1.11 Revegetation and
Site Restoration**

- .1 Disturbed areas adjacent to ditches, watercourses and storm water systems, and bulding improvments shall be re-seeded to prevent surface erosion and/or downstream water quality impacts.
- .2 Ditches and newly constructed diversion channels shall be seeded and planted with grasses and/or native vegetation, to reduce surface erosion.
- .3 Any natural areas disturbed during the course of construction is to be restored to as good as or better than the original site condition.

**1.12 Spill Prevention and
Emergency Response**

- .1 The Contractor shall develop a Spill Prevention and Emergency Response Plan and distribute it to the Departmental Representative prior to commencing any work.
- .2 The Contractor shall complete a daily visual inspection of all hazardous material and equipment for signs of leakage. Daily visual inspection will include, among other things ensuring that all personal protective equipment and other emergency response equipment is in its place.
- .3 The Contractor shall maintain a readily available supply of spill emergency response material and equipment on site at all times in effective working condition appropriate to the scale of the project.
- .4 The Contractor shall deal with any spills which occur immediately.
- .5 The Contractor shall report any environmental incident or spill/release of a substance to the Departmental Representative and to the Provincial Emergency Program of the Ministry of Attorney General in accordance with the Spill Reporting Regulations of the Waste Management Act.

END OF SECTION

PART 1 - GENERAL

- 1.1 General**
- .1 The "General Conditions" and "Supplementary General Conditions" shall form part of this section.
 - .2 Use new material and equipment unless otherwise specified.
 - .3 Provide material and equipment of specified design and quality, performing to published ratings and for which replacement parts are readily available.
 - .4 Use products of one manufacturer for equipment or material of same type or classification unless otherwise specified.
- 1.2 Manufacturers' Instructions**
- .1 Unless otherwise specified, comply with manufacturers' latest printed instructions for materials and installation methods.
 - .2 Notify Departmental Representative in writing of any conflict between these Specifications and manufacturers' instructions. Departmental Representative will designate which document is to be followed.
- 1.3 Delivery and Storage**
- .1 Deliver, store, and maintain package material and equipment with manufacturers' seals and labels intact.
 - .2 Prevent damage, adulteration and soiling of material and equipment during delivery, handling and storage. Immediately remove rejected material and equipment from site.
 - .3 Store material and equipment in accordance with supplier's instructions.
 - .4 Touch-up damaged factory-finished surfaces to Departmental Representative's satisfaction. Use primer or enamel to match original. Do not paint over nameplates.
- 1.4 Contractor's Options for Selection of Products for Tendering**
- .1 When a material or equipment is specified by Prescriptive or Performance specifications, select any product that meets or exceeds the specification.
 - .2 When a product is specified by Reference standard, select any product that meets or exceeds the reference standard.
 - .3 When a product is referenced under 'Acceptable Products' or 'Acceptable Alternate', select any one (1) of the indicated manufacturers, or any other manufacturer meeting or exceeding the prescriptive specification.
- 1.5 Substitution**
- .1 Proposals for substitution may be submitted only after award of Contract. Such requests must include statements of respective costs of items originally specified and proposed substitutions.
 - .2 Proposals will be considered by Departmental Representative if:

- .1 Products selected by Tenderer from those specified are not available; or
 - .2 Delivery date of products selected from those specified would unduly delay completion of Contract; or
 - .3 Alternative products to those specified, which are brought to attention of, and considered by Departmental Representative as equivalent to those specified and will result in credit of Contract amount.
- .3 Should proposed substitution be accepted either in part or in whole, assume full responsibility and costs when substitution affects other work on project. Pay for drawing changes required as result of substitution.
- .4 All credits arising from approval of substitutions will be credited to Contract in such amounts as may be determined by Departmental Representative and Contract price will be adjusted accordingly. No substitutions will be permitted without prior written approval of Departmental Representative.

END of SECTION

- 1.0 Construction Safety Measures**
- .1 Observe and enforce construction safety measures required by Canadian Construction Safety Code, Provincial Government, Workmen's Compensation Board, Workplace Hazardous Materials Information System Requirements, including training of all workers on the job site, and municipal status and authorities.
 - .2 In event of conflict between any provisions of above authorities the most stringent provision will apply.
- 2.0 References**
- .1 Canada Labour Code, Canada Occupational Safety and Health Regulations.
 - .2 American National Standards Institute (ANSI):
 - .1 ANSI A10.3, Operations – Safety Requirements for Powder-Actuated Fastening Systems.
 - .3 Canadian Standards Association (CSA):
 - .1 CSA S269.1-1975 (R1998), Falsework for Construction Purposes.
 - .2 CSA S269.2-M87 (R1998), Access Scaffolding for Construction Purposes.
 - .4 Fire Commissioner of Canada (FCC):
 - .1 FCC No. 301-1982, Standard for Construction Operations.
 - .2 FCC No. 302-1982, Standard for Welding and Cutting.
 - .5 National Building Code of Canada, current edition:
 - .1 Part 8, Safety Measures at Construction and Demolition Sites.
 - .6 Province of British Columbia:
 - .1 Workers Compensation Act (Occupational Health & Safety), Amendment Act, B.C. Reg. 185/99, herein referred to as the Workers Compensation Act (WCA).
- 3.0 Related Sections**
- .1 Refer to the following sections as required:
 - .1 Section 01330 *Submittals*.
- 4.0 Workers' Compensation Board Coverage**
- .1 Comply fully with the Worker's Compensation Act, Regulations and orders made pursuant thereto, and any amendments up to the completion of the work.
 - .2 Maintain Workers' Compensation Board coverage during the term of the Contract, until and including the date that the Certificate of Final Completion is issued.
- 5.0 Compliance with Regulations**
- .1 It is the Contractor's responsibility to ensure that all workers are qualified, competent and certified to perform the work as

required by the Workers' Compensation Act or the Occupational Health and Safety Regulations.

- 6.0 Submittals**
- .1 Perform submittals in accordance with *Section 01330 Submittals*.
 - .2 Submit the following:
 - .1 Health and Safety Plan.
 - .2 Copies of reports or directions by federal and provincial health and safety inspectors.
 - .3 Copies of incident and accident reports.
 - .4 Complete set of Material Safety Data Sheets (MSDS), and all other documentation required by Workplace Hazardous Materials information System (WHMIS) requirements.
 - .5 Emergency procedures.
 - .3 The Departmental Representative will review the Contractor's site-specific project Health and Safety Plan and emergency procedures and provide comments to the Contractor within 10 days after receipt of the plan. Revise the plan as appropriate and resubmit to Departmental Representative for review upon request.
 - .4 Submission of the Health and Safety Plan, and any revised version, to the Departmental Representative are for information and reference purposes only. It shall not:
 - .1 Be construed to imply approval by the Departmental Representative.
 - .2 Be interpreted as a warranty of being complete, accurate and legislatively compliant.
 - .3 Relieve the Contractor of his legal obligations for the provision of health and safety on the project.
- 7.0 Responsibility**
- .1 Be responsible for:
 - .1 The safety of persons and property on site; and
 - .2 The protection of persons off site, and the environment to the extent that they may be affected by the conduct of the work.
- 8.0 Regulatory Requirements**
- .1 Comply with specified codes, acts, bylaws, standards, and regulations to ensure safe operations at site.
 - .2 In event of conflict between any provisions of the above authorities, the most stringent provision will apply. Should a dispute arise in determining the most stringent requirement, the Departmental Representative will advise on the course of action to be followed.
- 9.0 Filing of Notice**
- .1 The Prime Contractor is to complete and submit a Notice of Project as required by provincial authorities.

10.0 Health and Safety Plan

- .1 Conduct a site-specific hazard assessment based on review of Contract documents, required work, and project site. Identify any known and potential health risks and safety hazards.
- .2 Prepare and comply with a site-specific project Health and Safety Plan based on hazard assessment, including, but not limited to, the following:
 - .1 Contractor's safety policy.
 - .2 Identification of applicable obligations.
 - .3 Definition of responsibilities for project safety/organization chart for project.
 - .4 General safety rules for project.
 - .5 Job-specific safe work, procedures.
 - .6 Inspection policy and procedures.
 - .7 Incident reporting and investigation policy and procedures.
 - .8 Occupational Health and Safety Committee/Representative procedures.
 - .9 Occupational Health and Safety meetings.
 - .10 Occupational Health and Safety communications and record keeping procedures.
- .3 Summary of health risks and safety hazards resulting from analysis of hazard assessment, with respect to site tasks and operations which must be performed as part of the work.
- .4 List hazardous materials to be brought on site as required by work.
 - .1 Indicate Consultation and administrative control measures to be implemented at the site for managing identified risks and hazards.
 - .2 Identify personal protective equipment (PPE) to be used by workers.
 - .3 Identify personnel and alternates responsible for site safety and health.
 - .4 Identify personnel training requirements and training plan, including site orientation for new workers.
- .5 Develop the plan in collaboration with all subcontractors. Ensure that work/activities of sub-contractors are included in the hazard assessment and are reflected in the plan.
- .6 Revise and update Health and Safety Plan as required and resubmit to the Departmental Representative.

11.0 Emergency Procedures

- .1 List standard operating procedures and measures to be taken in emergency situations. Include an evacuation plan and emergency contacts (i.e. name/telephone numbers) of:
 - .1 Designated personnel from own company.

- .2 Regulatory agencies applicable to work and as per legislated regulations.
 - .3 Local emergency resources.
 - .2 Include the following provisions in the emergency procedures:
 - .1 Notify workers and the first aid attendant, of the nature and location of the emergency.
 - .2 Evacuate all workers safety.
 - .3 Check and confirm the safe evacuation of all workers.
 - .4 Notify the fire department or other emergency responders.
 - .5 Notify adjacent workplaces or buildings which may be affected if the risk extends beyond the workplace.
 - .6 Notify Departmental Representative.
 - .3 Revise and update emergency procedures as required and resubmit to the Departmental Representative.
 - .4 Be responsible for implementing, daily enforcing, and monitoring the site-specific Health and Safety Plan.
- 12.0 Monitoring**
 - .1 Attend health and safety pre-construction meeting and all subsequent meetings called by the Departmental Representative.
- 13.0 Hazardous Products**
 - .1 Comply with requirements of Workplace Hazardous Materials Information System (WHMIS) regarding use, handling, storage and disposal of hazardous materials, and regarding labeling and provision of Material Safety Data Sheets (MSDS) acceptable to the Departmental Representative and in accordance with the Canada Labour Code.
 - .2 Where use of hazardous and toxic products cannot be avoided:
 - .1 Advise Departmental Representative beforehand of the product(s) intended for use. Submit applicable MSDS and WHMIS documents as indicated.
 - .2 Provide adequate means of ventilation in accordance with *Section 01500 Temporary Facilities*.
- 14.0 Electrical Safety Requirements**
 - .1 Comply with authorities and ensure that, when installing new facilities or modifying existing facilities, all electrical personnel are completely familiar with existing and new electrical circuits and equipment and their operation.
 - .1 Before undertaking any work, co-ordinate required energizing and de-energizing of new and existing circuits with the Departmental Representative.
 - .2 Maintain electrical safety procedures and take necessary precautions to ensure safety of all personnel working under this Contract, as well as safety of other personnel on site.

- 15.0 Electrical Lock-Out**
- .1 Develop, implement and enforce use of established procedures to provide electrical lock-out and to ensure the health and safety of workers for every event where work must be done on any electrical circuit or facility.
 - .2 Prepare the lockout procedures in writing, listing step-by-step processes to be followed by workers, including how to prepare and issue the request/authorization form. Have the procedures available for review upon request by the Departmental Representative.
 - .3 Keep the documents and lockout tags at the site and list in a logbook for the full duration of the Contract. Upon request, make such data available for viewing by Departmental Representative or by any authorized safety representative.
- 16.0 Overloading**
- .1 Ensure no part of work is subjected to a load which will endanger its safety or will cause permanent deformation.
- 17.0 Falsework**
- .1 Design and construct falsework in accordance with CSA S269.1.
- 18.0 Scaffolding**
- .1 Design, construct and maintain scaffolding in a rigid, secure and safe manner, in accordance with CAN/CSA S269.2.
- 19.0 Powder-Actuated Devices**
- .1 The floor slabs are reinforced concrete. Use powder-actuated devices to core new holes in accordance with ANSI A10.3 only after receipt of written permission from the Departmental Representative.
- 20.0 Fall Protection**
- .1 All persons shall wear fall protection when working on roof areas, in accordance with WCB Regulations.
- 21.0 Fire Safety and Hot Work**
- .1 Obtain Departmental Representative's authorization before any welding, cutting or any other hot work operations can be carried out on site.
- 22.0 Fire Safety Requirements and Hot Work**
- .1 Store oily/paint-soaked rags, waste products, empty containers and materials subject to spontaneous combustion in ULC approved, sealed containers and remove from site on a daily basis.
 - .2 Handle, store, use and dispose of flammable and combustible materials in accordance with the National Fire Code of Canada.

23.0 Fire Protection and Alarm Systems

- .1 Fire protection and alarm systems shall not be:
 - .1 Obstructed.
 - .2 Shut off.
 - .3 Left inactive at the end of a working day or shift.
- .2 Do not use fire hydrants, standpipes and hose systems for purposes other than fire fighting.
- .3 Be responsible/liable for costs incurred from the fire department and the building owner (and tenants), resulting from false alarms.

24.0 Unforeseen Hazards

- .1 Should any unforeseen or peculiar safety-related factor, hazard or condition become evident during performance of the work, immediately stop work and advise the Departmental Representative verbally and in writing.

25.0 Posted Documents

- .1 Post legible versions of the following documents on site:
 - .1 Health and Safety Plan.
 - .2 Sequence of work.
 - .3 Emergency procedures.
 - .4 Site drawing showing project layout, locations of the first aid station, evacuation route and marshalling station, and the emergency transportation provisions.
 - .5 Notice of Project.
 - .6 Floor plan(s).
 - .7 Notice as to where a copy of the Worker's Compensation Act and Regulations are available on the work site for review by employees and workers.
 - .8 Workplace Hazardous Materials Information System (WHMIS) documents.
 - .9 Material Safety Data Sheets (MSDS).
 - .10 Names of Joint Health and Safety Committee members, or Health and Safety Representatives, as applicable.
- .2 Post all Material Safety Data Sheets (MSDS) on site, in a common area, visible to all workers and in locations accessible to tenants when work of this Contract includes construction activities adjacent to occupiers areas.

26.0 Correction of Non-Compliance

- .1 Immediately address health and safety non-compliance issues identified by the Departmental Representative.
- .2 Provide Departmental Representative with written report of action taken to correct non-compliance with health and safety issues identified.
- .3 The Departmental Representative may issue a "stop work order" if non-compliance of health and safety regulations is not corrected immediately or within posted time. The Prime

Contractor/sub-contractors will be responsible for any costs arising from such a “stop work order”.

END of SECTION

- 1.0 Requirements Included**
- .1 Final Cleaning
 - .2 Systems demonstration
 - .3 Document submission
 - .4 Project commissioning
 - .5 Inspection and takeover procedure
- 2.0 Related Requirements**
- .1 Submittals
 - .2 General Conditions of the Contract: Fiscal provisions, legal submittals, and other administrative requirements.
- 3.0 Final Cleaning**
- .1 Refer to CCDC 2 GC 3.13 CLEANUP.
 - .2 When the work is Substantially Completed, remove surplus products, tools construction and equipment not required for the performance of the remaining work.
 - .3 Remove waste products and debris and leave the work clean and suitable for occupancy by Owner.
 - .4 Make arrangements with and obtain permits from Authorities Having Jurisdiction for disposal of waste and debris.
 - .5 Leave the work broom clean before the inspection process commences.
 - .6 Clean and polish glass, mirrors, hardware, wall tile, chrome, baked enamel, plastic laminate, mechanical, plumbing and electrical fixtures. Replace broken, scratched or disfigured glass.
 - .7 Remove stains, spots, marks and dirt from decorative work, electrical and mechanical fixtures, furniture fitments, walls, floors, ceilings, fixtures and equipment.
 - .8 Vacuum clean and dust building interiors, behind grilles, louvres and screens.
 - .9 Wax, seal, shampoo or prepare floors finishes, as recommended by the manufacturer.
 - .10 Inspect finishes, fitments and equipment and ensure specified workmanship and operation.
 - .11 Broom clean and wash exterior walks, steps and surfaces.
 - .12 Remove dirt and other disfigurations from exterior surfaces.
 - .13 Clean, sweep roofs and clean around roof drains. Clean gutters, downspouts and drainage systems.
 - .14 Sweep and wash clean site paved areas.
 - .15 Clean equipment and plumbing fixtures to a sanitary condition. Clean or replace filters of mechanical equipment.
- 4.0 Systems Demonstration**
- .1 Prior to final inspection, demonstrate operation of each system to the Departmental Representative.
 - .2 Instruct personnel in operation, adjustment and maintenance of equipment and systems, using provided operation and maintenance data as the basis for instruction.

5.0 Project Commissioning

- .1 Expedite and complete deficiencies and defects identified by the Departmental Representative.
- .2 Review maintenance and manual contents, operating, maintenance instructions, record drawings, spare parts, materials for completeness.
- .3 Submit required documentation such as statutory declarations, Worker's Compensation certificates, warranties, and certificates of approval or acceptance from regulating bodies.
- .4 Attend end-of-work testing and break-in or start-up demonstration.
- .5 Review inspection and testing reports to verify conformance to the intent of the documents and that changes, repairs or replacements have been completed.
- .6 Meet with other Consultants (structural, mechanical and electrical) to coordinate completion, testing approvals if and when required by Departmental Representative.
- .7 Review condition of equipment heating system which may have been used in the course of the work to ensure turning over at completion in "as new condition" with warranties, dated and certified from time of Substantial Completion of the Work.
- .8 Arrange of coordinate instruction of Owner's staff in care, maintenance and operation of building systems and finishes by Suppliers or Subcontractors.
- .9 When partial occupancy of uncompleted project is required by the Owner, coordinate Owner's uses, requirements and access with Contractor's requirements to complete project.
- .10 Coordinate Owner's moving in of furnishings and equipment with building accessibility, traffic and Contractor's and Subcontractor's cleaning-up and completion activities all to suite Owner's work schedule.
- .11 Provide on-going review, inspection and attendance to building callback, maintenance and repair problems during the warranty period.

6.0 Substantial Performance

- .1 Submit written notice to the Departmental Representative indicating when project is Substantially Complete. Attach a list of major items to be completed or corrected, and state the time required to perform the Work and the proposed completion date.
- .2 Allow for the Departmental Representative and together with the Owner's Inspector and Contractor to make an Inspection with seven (7) days after receipt of Contractor's Notice of Substantial Performance.
- .3 Before Substantial Performance is declared, the Departmental Representative will prepare and submit to the Contractor a deficiency list of items to be completed or corrected, and the time in which the Contractor shall be required to complete or

correct the Work listed. As determined by the review the Departmental Representative will also submit recommendation for deficiency holdback amount consideration and date schedule submission by Contractor for same, refer to General Condition GC5.

- .4 After Substantial Performance is declared, the Departmental Representative will prepare and issue a Certificate of Substantial Performance stating the date of Substantial Performance and a list of items to be completed or corrected.
- .5 The Contractor shall complete Work listed for completion or correction within the agreed to designated time schedule.
- .6 The Departmental Representative will immediately notify the Contractor, in writing, of Work not substantially performed, stating the reasons.
- .7 The Contractor shall complete the Work and send second written notice to the Departmental Representative, advising that the Work is substantially completed.
- .8 The Departmental Representative will re-review the Work for a second time.
- .9 Additional reviews of the Work required by the Departmental Representative will be at the expense of the Contractor.

7.0 Final Submittals

- .1 Provide project closeout submittals as specified in Section 01330 – submittals as directed by the Departmental Representative form supplied list within forty-five (45) days of the date of Substantial Completion.

8.0 Final Review indicating:

- .1 Submit written notice to the Departmental Representative
 - .1 Contract Documents have been reviewed.
 - .2 Work has been inspected for compliance with the Contract Documents.
 - .3 Work has been completed in accordance with the Contract Documents.
 - .4 Work is completed and ready for final inspection.
- .2 Allow for the Departmental Representative to make final inspection with seven (7) days after the receipt of the notice, after which time he will advise the date on which the inspection will be made and designate those parties required to participate.
- .3 During the inspection a list of all items not in accordance with Drawings and Specifications will be compiled by the Departmental Representative and supplied to the Contractor for distribution.
- .4 The Contractor shall then proceed to correct the deficiencies and complete the work in a satisfactory manner.

- .5 When the contractor is satisfied that all deficiencies have been corrected, he shall formally request a takeover inspection by the Departmental Representative.
- .6 After it has been agreed that the work is acceptable, the Owner will take possession.

9.0 Follow-up Review – Completion

- .1 Advise the Departmental Representative when all deficiencies have been corrected, and formally request for a follow-up inspection.
- .2 Forty-five (45) days after Substantial Performance has been declared, all deficiencies and outstanding work, all warranties and contract closeout documentation requested under the terms of the contract shall be completed by the General Contractor and Subcontractors. Failure to adhere to these conditions will result in the Owner retaining sufficient funds from the final payment at the time of substantial completion and engaging another Contractor to complete the outstanding items.
- .3 Obtain a declaration of Completion upon completion of all deficiencies and required corrective Work from the Departmental Representative. Formally request specified follow-up re-inspection until Completion has been declared.

10.0 Certificate of Completion

- .1 The Departmental Representative considers that Completion of Work is achieved, when the following items are effected:
 - .1 Physical completion of building and all related work.
 - .2 Occupancy permit has been obtained.
 - .3 Submission of all warranties specified.
 - .4 Submission of Record Drawings.
 - .5 Maintenance manuals and materials are delivered and received by the Owner.

11.0 Final Accounting

- .1 Submit final statement of accounts to the Departmental Representative reflecting all adjustments and the following:
 - .1 Original Contract Sum.
 - .2 Additions and deductions resulting from:
 - .1 Change Orders.
 - .2 Unit Prices.
 - .3 Other adjustments.
 - .4 Deductions from uncorrected.
 - .3 Total Contract Sum as adjusted.
 - .4 Previous payments.
- .5 Sum remaining due. Final payment shall only be made by the Owner after all deficiencies have been corrected and all submittals specified have been delivered to the Owners.

END of SECTION

- 1.0 General**
- .1 The "General Conditions" and "Supplementary General Conditions" shall form part of this section.
- 2.0 Record Drawings**
- .1 Contractor to provide two (2) sets of marked-up white prints and (2) sets of specifications for "As Built" purposes.
- .2 Maintain project record drawings and record accurately significant deviations, including out of sight deviations, from Contract Documents caused by site conditions and changes ordered by Consultant.
- .3 Mark record changes in red.
- .4 Record following information:
- .1 Horizontal and vertical location of underground utilities and appurtenances referenced to permanent surface improvement.
- .2 Location of internal utilities and appurtenances concealed in construction referenced to visible and accessible features of structure.
- .3 Field changes of dimension and detail.
- .4 Changes made by Site Instruction, Change Order or Field Direction.
- .5 At completion of project and prior to final inspection, neatly transfer record notations to second set and submit both sets to Consultant.

END of SECTION

- 1.0 General** .1 The "General Conditions" and "Supplementary General Conditions" shall form part of this section.
- 2.0 Maintenance Manual** .1 On completion of project, submit to Departmental Representative four (4) copies of Operations Data & Maintenance Manual in English:
- .1 Bind data in vinyl hard covered, 3-ring loose leaf binder for 215 x 280 mm size paper.
 - .2 Title sheet labeled "Operation Data and Maintenance Manual", project name, date, and list of contents.
 - .3 Organize contents into applicable Sections of work to parallel project specification break-down. Mark each Section by labeled tabs protected with celluloid covers fastened to hard paper dividing sheets.
- .2 Include following information plus data specified.
- .1 Maintenance instruction for finished surface + materials.
 - .2 Copy of hardware and paint schedules.
 - .3 Description, operation and maintenance instructions for equipment and systems, including complete list of equipment and parts list. Indicate nameplate information such as make, size, capacity, and serial number.
 - .4 Names, addresses and phone numbers of sub-contractors and suppliers and their contributions to the project.
 - .5 Guarantees, warranties and bonds showing:
 - .1 Name and address of projects.
 - .2 Guarantee commencement date of Final Certificate of Completion.
 - .3 Duration of guarantee.
 - .4 Clear indication of what is being guaranteed and what remedial action will be taken under guarantee.
 - .5 Signature and seal of Contractor.
 - .6 Additional material used in project listed under various Sections showing name of manufacturer and source of supply.
- .3 Neatly type lists and notes. Use clear Drawings, diagrams or manufacturers' literature.
- .4 Include one complete set of final shop Drawings bound separately indicating corrections and changes made during fabrication and installation.
- .5 Include one complete set of the contractors as built dwgs bound separately.
- .6 Additionally, submit to the Departmental Representative a USB device containing an electronic copy of the Operation and Maintenance Manuals in PDF format. The Operations and Maintenance manuals to include all mechanical/ electrical/ and commissioning work. The USB device shall bear a label with the project name, O+M manuals, and date submitted.

- 3.0 Maintenance Materials** .1 Where supply of maintenance materials is specified, deliver to Departmental Representative as follows:
- .1 Materials in unbroken cartons, or if not supplied in cartons, they shall be strongly packaged.
 - .2 Clearly mark as to content.
 - .3 If applicable give colour, room number or area where material used.
 - .4 Include a record of inventory of maintenance materials and quantities.
 - .5 Include complete record of maintenance materials in both the hard copy Operation and Maintenance Manuals and the electronic PDF manual.

END of SECTION

PART 1 - GENERAL

- 1.1 General** .1 The "General Conditions" and "Supplementary General Conditions" shall form part of this section.
- 1.2 Related Work**
- .1 *Cast-in-Place Concrete* *Section 03300*
 - .2 *Reinforcing Steel* *Section 03200*
 - .3 *Special Concrete Finishes* *Section 03350*
- 1.3 Reference Standards** .1 Design and construction of formwork and falsework shall conform to the following codes and standards:
- .1 CSA-A23.1, Concrete Materials and Methods of Concrete Construction.
 - .2 CAN/CSA-086.1, Engineering Design in Wood (Working Stress Design & Limit States Design).
 - .3 CSA S269.1, Falsework for Construction Purposes, and CAN/CSA - S269.3, Concrete Formwork.
 - .4 Local codes and by-laws.
 - .5 Workers Compensation Board regulations.
 - .6 National Building Code of Canada (NBCC), current edition. See Structural Notes.
 - .7 British Columbia Building Code (BCBC). See Structural Notes.
 - .8 ACI Standards.
- 1.4 Examination** .1 Structural drawings and specifications shall be examined for work that might affect formwork.

PART 2 - PRODUCTS

- 2.1 Wood**
- .1 Sawn lumber: Douglas fir, construction grade, or as approved.
 - .2 Plywood: Douglas fir, concrete form grade, conforming to CSA O121.
 - .3 Chamfer strips: cut from sawn lumber, 20 mm x 45 degrees.
- 2.2 Metal Forms** .1 Metal forms: made of sheet or plate steel with sufficient rib stiffening.
- 2.3 Form Release Agent**
- .1 Form Release Agent: non-staining, mineral type, free from volatile constituents.
 - .2 Form release agents shall not be applied where concrete surfaces are to receive finishes affected by the form release agent.
- 2.4 Ties**
- .1 Internal form ties shall be metal and of a type so that no metal will be within 25 mm of the concrete surface when forms have been removed.
 - .2 Ties shall have tapered plastic cones at faces of concrete to allow for grouting.

- .3 Ties for watertight and underground structures shall have a waterstop flange at mid-length and be completely free of grease and form release agent.
- .4 Form ties shall have a minimum ultimate strength of 250 MPa. Form ties shall be adjustable in length to permit tightening. Twisted wire form ties shall not be used.

2.5 Shoring

- .1 Shoring shall be either lumber or steel.
- .2 Lumber grade no less than that used in formwork design.
- .3 Steel shoring shall be adjustable with provisions for attachment of bracing, and shall have a rated load-bearing capacity.

PART 3 - EXECUTION

3.1 Design of Forms and Falsework

- .1 Forms shall be built sufficiently strong and rigid to sustain the weight or fluid pressure of concrete plus any superimposed construction loads without noticeable deflection. Forms shall be sufficiently tight to prevent leakage of mortar.
- .2 Forms shall be so constructed that they may be dismantled and removed without damaging concrete.

3.2 Treatment

- .1 Forms shall be treated with form release agent prior to placing of reinforcement.
- .2 Reinforcement shall not be contaminated with form release agent.
- .3 Untreated forms shall be kept wetted down to prevent shrinkage prior to placing concrete and shall be surface wetted at the time of placing.

3.3 Alignment During Placing

- .1 Forms shall be checked frequently for alignment and elevation during placing. A suitable means for checking forms shall be provided.
- .2 Corrective adjustments shall be carried out as required until concrete is in place.

3.4 Shoring

- .1 Shores shall be set on wedges or shall be adjustable so they may be removed without causing undue strains in the concrete.
- .2 Shores shall be braced horizontally and diagonally in two (2) directions. Braces shall be adequate in strength to prevent buckling and to withstand lateral forces.

3.5 Formwork Tolerances

- .1 Variation from plumb: in lines and surfaces of walls and in arises - 2 mm per metre, but not more than 25 mm.
- .2 Footings:
 - .1 Variation in dimensions in plan:
 - a) Minus 12 mm

- b) Plus 50 mm
- .2 Misplacement or eccentricity:
 - a) 2% of the footing width in the direction of misplacement but not more than 50 mm
- .3 Reduction in thickness:
 - a) Minus 5% of specified thickness

- 3.6 Removal**
 - .1 The Departmental Representative will have the right to order concrete removed which has become mis-aligned during placing.

- 3.7 Re-Use**
 - .1 Forms may be re-used after adequate cleaning, provided the faces have not become cracked or roughened. Forms so used shall be trimmed and properly patched.

- 3.8 Stripping**
 - .1 Unless otherwise authorized by the Departmental Representative, leave form work in place for the following minimum period of time after placing concrete or until the concrete has gained sufficient strength to carry its own weight, plus construction loads and design loads that are liable to be imposed:
 - .1 Three days for walls, columns and sides of beams.
 - .2 Twenty-eight days for beam soffits, slabs and other structural members, or five days when replaced immediately with adequate shoring to Standard specified for falsework.

- 3.9 Chamfer**
 - .1 Chamfer exposed external corners 20 mm where specified – see drawings for details.

END OF SECTION

PART 1 - GENERAL

- 1.1 General** .1 The "General Conditions" and "Supplementary General Conditions" shall form part of this section.
.2 All works and materials shall meet requirements of above referenced standards, General Conditions, Supplementary General Conditions, and specific requirements outlined in the following sub-sections.
- 1.2 Related Sections** .1 *Cast-in-Place Concrete* *Section 03300*
- 1.3 Field Review** .1 Notify Departmental Representative 72 hours prior to concrete pour for review of placement of reinforcement.
- 1.4 Reference Standards** .1 See Structural notes.
.2 Referenced standards refer to the latest edition or revision except where specified otherwise.
- 1.5 Alternate Layout** .1 Submit in writing all proposed alternate steel reinforcing layouts to Departmental Representative for review.

PART 2 - PRODUCTS

- 2.1 Material & Construction Standards** .1 CSA-A23.1 - Concrete Materials and Methods of Concrete Construction.
.2 Reinforcing Steel Manual of Standard Practice by the Reinforcing Steel Institute of Canada (current edition).
- 2.2 Testing** .1 CSA-A23.2 – Test Methods and Standard Practices for Concrete.
- 2.3 Reinforcing Steel** .1 See Structural Notes and Drawings for type and grade.
.2 In accordance with CSA-G30.18 - Billet Steel Bars for Concrete Reinforcement. Welded wire mesh where called up in the drawings to be flat sheets (rolls not acceptable).
.3 Welded Steel Fabric shall be smooth finish in accordance with CSA-G30.5 Welded Steel Wire Fabric for Concrete Reinforcement.
.4 Welding of reinforcing steel shall be in accordance with CSA-W186 Welding of Reinforcing Bars in Reinforced Concrete Construction and shall be performed by a company certified by the Canadian Welding Bureau.
.5 Tie wire shall be 16 gauge, cold-drawn, annealed wire and shall be in accordance with CSA-G30.3.
- 2.4 Fabrication** .1 Fabricate reinforcing steel in accordance with Reinforcing Steel Manual of Standard Practice by the Reinforcing Steel Institute of Canada.

- .2 Fabricate reinforcing steel with bends, hooks, splice lengths as indicated on drawings.
- .3 Do not field bend reinforcing steel unless indicated on drawings. Field bend shall be cold bent and shall not be straightened and re-bent. Replace if cracks or splits develop.

PART 3 - EXECUTION

3.1 Placing

- .1 Reinforcement of size and layout shown on structural drawings shall be accurately placed and aligned. Place all dowels accurately.
- .2 Reinforcing steel shall be placed to meet standard tolerances.
- .3 Place reinforcing steel to minimize number of splices.
- .4 Use non-staining supports and spacers for exposed concrete.

3.2 Concrete Cover

- .1 See Structural Notes and Details.

3.3 Splicing

- .1 See Structural Notes.

END OF SECTION

PART 1 - GENERAL

- 1.1 General** .1 The "General Conditions" and "Supplementary General Conditions" shall form part of this section.
- 1.2 Description** .1 This section specifies requirements for all plain and reinforced cast-in-place concrete as described herein and as shown on the Drawings, or reasonably implied to provide a complete structure.
- 1.3 Reference Standards** .1 Do cast-in-place concrete work in accordance with the latest issues of:
- .1 CSA-A23.1 - Concrete Materials and Methods of Concrete Construction.
 - .2 CSA-A23.2 – Test Methods and Standard Practices for Concrete.
 - .3 CSA-A23.3 - Design of Concrete Structures.
 - .4 ACI 350 - Environmental Engineering Concrete Structures.
- .2 Keep a current copy of the above CSA Standards on site for the duration of the work. "Standard" referred to later in this Specification refers to these CSA Standards.
- 1.4 Related Sections**
- .1 *Concrete Forms and Accessories* *Section 03100*
 - .2 *Reinforcing Steel* *Section 03200*
 - .3 *Concrete Finishes* *Section 03350*
 - .4 *Hardened Polished Concrete Floor* *Section 03360*
 - .5 *Damproofing and Waterproofing* *Section 07100*
- 1.5 Mix Design Submission** .1 Submit certified copy of mix design conforming to specified requirements.
- 1.6 Concrete Testing** .1 Contractor to employ an independent testing firm to make the required field and laboratory tests in accordance with the Standard for field control of concrete quality during construction. Make available materials, space, and equipment as are necessary for the tests.

PART 2 - PRODUCTS

- 2.1 Materials**
- .1 Cement: Refer to Structural Notes and Drawing for type.
 - .2 Water, fine aggregates, Group I, normal weight coarse aggregates: to CSA-A23.1, unless otherwise specified.
 - .3 Non-shrink grout: premixed compound consisting of non-metallic aggregate, cement, water reducing and plasticizing agents, of pouring consistency, capable of developing compressive strength of 50 MPa at 28 days.
 - .4 Waterstop for Concrete Joint: Acceptable Products; Krystol Specification No. 3 including Kim Waterstop Slurry and Kim Waterstop Grout.

- 2.2 Concrete Mix Design**
- .1 The Contractor is responsible for selecting mix designs to meet the required concrete specifications as noted on the drawings.
 - .2 Mass density: supply only concrete with air dry unit mass between 2,150 and 2,500 kg/m³ unless otherwise specified.

PART 3 - EXECUTION

- 3.1 Field Review**
- .1 Refer to *Section 03200 Reinforcing Steel*, and the Structural Notes.

- 3.2 Concrete Placing**
- .1 Concrete placing method shall prevent segregation, ensure homogeneous concrete without voids, and ensure reinforcement and inserts are not disturbed.
 - .2 Prepare previously placed concrete by cleaning with steel brush and applying bonding agent according to manufacturer's instruction.
 - .3 Ensure reinforcement and inserts are not disturbed during concrete placement. Have reinforcing steel worker in attendance during pour.

- 3.3 Inserts**
- .1 Correctly position all pipes, sleeves, bolts, hangers and other inserts in the concrete as required by other trades or as shown on the Drawings.
 - .2 No additional embedded items are permitted in the concrete unless specifically authorized by the Departmental Representative.

- 3.4 Formwork**
- .1 Refer to *Section 03100 Concrete Forms and Accessories*.

- 3.5 Construction Joints**
- .1 Construction joint details and locations to be submitted to Architect/Engineer for review.

- 3.6 Finishing**
- .1 Formed Surfaces: finish to the requirements of the Standard and as shown on Drawings.
 - .2 Unformed surfaces: finish to the requirements of the Standard. The degree of finishing as defined below shall be noted on the Drawings or in the Special Specifications.
CSA Standards: Slab & Floor Finish Classifications:
 - .1 Class A - Conventional (smooth):
Steel trowel finish with hand screeding; free of trowel marks and ridges. Straightedge tolerance = $\pm 8\text{mm}$. $F_F = 20$, $F_L = 15$, and $\text{SWI} = 5\text{mm}$
 - .2 Class B - Conventional (nonslip):
Broom or float finish with hand screeding. Straightedge tolerance = $\pm 12\text{mm}$. $F_F = 15$, $F_L = 15\text{mm}$, and $\text{SWI} = 8\text{mm}$.
 - .3 Class C - Moderately flat:

Steel trowel finish with highway straightedge in alternate strip placements typically 10m to 15m wide. Straightedge tolerance = ± 5 mm. $F_F = 30$, $F_L = 20$, and $SWI = 3$ mm.

.4 Class D - Flat:

Steel trowel finish with highway straightedge in alternate strip placements 3m to 8m wide. Straightedge tolerance is not recommended. $F_F = 40$ to 60 , $F_L = 30$ to 50 , and $SWI = 2$ mm.

3.7 Tolerances

- .1 Construct formwork and falsework to meet standard tolerances and closer tolerances for specific items such as follows:
 - .1 Plumbness of columns and walls shall be within 1:400 measured at any one surface but total variation shall be not more than 40 mm for the total height of the structure.
 - .2 Surface of wall tolerance: See Section 3.6 Finishing.
 - .3 Level of floor tolerance: See Section 3.6 Finishing.
- .2 Tolerances shall not be cumulative.

3.8 Defective Concrete

- .1 Remove and replace excessive honeycomb or embedded debris in concrete as directed by Engineer.

3.9 Patching

- .1 In accordance with Engineer's review and directions, patch surface imperfections within 24 hours of stripping of forms as follows:
 - .1 Chip down edges perpendicular to surface to Engineer's approval.
 - .2 Wet area and brush on 1:1 cement/sand grout.
 - .3 Patch with 1:2 cement/sand mortar with 10% hydrated lime.

3.10 Curing

- .1 Cure concrete in accordance with the Standard. Obtain approval of the Engineer for each method used.

3.11 Failure to Meet Requirements

- .1 When any concrete is not in accordance with these Specifications or the Standard, obtain Engineer's ruling on whether to remove and replace it or apply the remedies provided in the Standard to the Engineer's approval.

END OF SECTION

PART 1 - GENERAL

- 1.1 General** .1 The "General Conditions" and "Supplementary General Conditions" shall form part of this section.
- 1.2 Reference Standards** .1 See Structural Notes.
- 1.3 Testing** .1 Testing of structural steel, welding, and bolting shall be performed at Engineer's request at the Contractor's expense.
.2 Testing of structural steel shall take into account both mechanical properties and chemical composition and shall meet type and grade as specified on drawings and shall be performed in accordance with reference standards.
.3 Performed by a testing agency approved by Engineer.
- 1.4 Field Review** .1 Contractor shall give Engineer 72 hours notice for field review of structural steel prior to covering up.
.2 Inspection of structural steel fabrication, welding, and bolting shall be performed at Engineer's request.
.3 Welding inspection shall be performed by an inspection agency approved by Engineer and certified under CSA-W178.1 and CSA-W178.2.
- 1.5 Shop and Erection Drawings** .1 See Structural Notes.
- 1.6 Structural Member Design** .1 All structural steel member connections shall be designed by a Professional Engineer (B.C. Registered) retained by the Structural Steel Supplier.

PART 2 - PRODUCTS

- 2.1 Materials** .1 See Structural Notes and drawings for details.
.2 All steel shall be new unless otherwise indicated and of sizes and shapes listed in current C.I.S.C. handbook and as indicated on the drawings.
- 2.2 Finishes** .1 All Exterior Structural Steel Elements, to be Hot Dip Galvanized (NOT TO BE CHROMATE PASSIVATED).
.2 Shop Prime all Interior Structural Steel Elements. Shop Primer CISC/CPMA 2-75.
.3 ALL exposed Structural Steel Elements will be further painted as per section 09900 Painting and Section 09999 Colour and Finish Schedule.

PART 3 - EXECUTION

- 3.1 Examination** .1 Verify location of all site concrete bases, anchor bolts and embedded steel items and ensure that work prepared by other trades is at proper elevation, level and true. Advise Departmental Representative in writing of all discrepancies

- prior to commencement of work. Where possible, verification shall be completed prior to steel fabrication so that changes, if required and approved by Departmental Representative, may be made to fit site conditions.
- 3.2 Storage and Handling**
- .1 Contractor shall protect all steelwork during fabrication, shipping, storage and construction. All bends and damages shall be reported to Departmental Representative for review. Contractor shall, at no cost to the owner, replace steel work which is bent, broken or otherwise damaged.
 - .2 Contractor shall schedule delivery and erection of in accordance with the construction schedule.
- 3.3 Co-ordination**
- .1 Supply all necessary instructions, drawings and structural steel items to other trades for setting bearing plates, anchor bolts, and other members that are required by other trades. Supply necessary materials to meet construction schedule.
- 3.4 Fabrication**
- .1 All fabricated units shall be in accordance with Consultant's reviewed shop drawings.
 - .2 All hollows structural sections shall be closed airtight with end plates sealed with welds.
 - .3 All steel shall be thoroughly cleaned of all loose mill scale and spatter, loose rust, slag, or flux deposits, oil or dirt.
 - .4 All plates and shapes shall be inspected visually for laminations. Replace plates or shapes that contain lamination without cost to the Owner.
- 3.5 Cleaning and Painting**
- .1 Surfaces of structural steel encased in concrete, requiring weld connection, and/or are utilized in slip-critical connection shall not be painted or primed; All other exterior steel surfaces shall be hot dip galvanized as per 2.2 Finishes above. All other Interior Structural Steel Elements to be Shop Primed as per 2.2 Finishes above.
 - .2 Cleaning of surfaces before priming or painting shall be in accordance with Steel Structures Painting Council SP-3 and SP-6 and compatible with finish requirements of section 09900 Painting and Section 09999 Colour and Finish Schedule.
 - .3 After erection and connections are complete, provide a field touch-up coat of paint to all surfaces that have been scraped or chipped. Surfaces receiving a finish coat shall be prepared and maintained in a condition acceptable to the finish painting contractor.
- 3.6 Erection**
- .1 Supervise setting of bases, anchor bolts, etc. Cutting at base plates to accommodate anchor bolts shall be cause for rejection of base plates.
 - .2 Contractor shall install all temporary bracing that is required to stabilize the work against construction and erection loads.

- .3 As erection progresses, the work shall be securely bolted to take care of all dead loads and erection stresses. Any failure to make proper and adequate provisions for stresses during erection shall be entirely at sole risk and responsibility of Contractor.
- .4 Structural steel erector shall be responsible for the design of all hooks, erection, connections and handling gear.
- .5 Wherever piles of materials, erection equipment or other loads are carried during erection, proper provision shall be made to take care of stresses resulting from same.
- .6 All structural steel shall be assembled and erected in accordance with the approved erection drawings and specified reference standards.
- .7 Structural steel work shall be carefully located at the proper grade and rigidly secured in place, using steel shims. All spaces under the steel shall then be filled with non-shrink pre-mix grout.
- .8 Plumb, level and align individual members of steel work to reference standard tolerances.

3.7 Welding

- .1 Submit welding procedures prepared and sealed by a Professional Engineer (BC registered) to the Engineer for his examination and comments. Welding procedures shall be Canadian Welding Bureau approved.
- .2 Welding consumables for all processes shall be fully approved by Canadian Welding Bureau and certified by the manufacturers as complying with the requirements of this specification. Such certificates shall be not more than two years old.

3. Galvanizing

- .1 Exterior Structural Steel Elements to be hot dip galvanized to ASTM A123 and CSA G-164, 21 oz/3.2 sq.ft. (NOT TO BE CHROMATE PASSIVATED). All Galvanized surfaces exposed to view in the finished condition to be filed smooth.
- .2 Work galvanized to receive an additional top coating paint/primer system. Refer to *Section 09900 Painting* of these specifications for finished paint and primer system requirements.
- .3 See *Section 09999 Colour and Finish Schedule*.
- .4 Galvanizing Repair Paint: to be compatible with substrate and with coating system as specified in *Section 09900 Painting* and *Section 09999 Colour and Finish Schedule*.

3.9 Protection and Clean Up

- .1 Protect the work of other sections from damage resulting from the work of this section.
- .2 As the work proceeds and on completion, remove from the premises all surplus materials and debris resulting from the work of this section.

END OF SECTION

PART 1 – GENERAL

- 1.1 General**
- .1 This Section of the Specification forms part of the Contract Documents and is to be read, interpreted and coordinated with all other parts.
 - .2 All work and materials shall meet requirements of Canadian Standards Association, American Society for Testing and Material, General Conditions, Supplementary General Conditions and specific requirements outlined in following sub-sections.
- 1.2 Shop Drawings**
- .1 Submit shop drawings to requirements of *Section 01330 Submittals* prior to commencement of fabrication.
 - .2 Indicate sizes, details and material specifications.
 - .3 Submit samples of metal finishes and fabrication to the Departmental Representative for approval.
 - .4 See also Structural Notes.
- 1.3 Quality Assurance**
- .1 All work of this section shall be performed by a contractor experienced in the fabrication and working of metals, including cutting, bending, forming and finishing, using personnel with a minimum of two (2) years proven experience.
 - .2 Workmanship for exposed work to be of the highest quality for exposed architectural metalwork.
- 1.4 Product Delivery, Storage and Handling**
- .1 Exercise care in storing, handling and erecting all material and support properly at all times so that no piece will be bent, twisted or otherwise damaged structurally or visually.
 - .2 Correct damaged material, if deemed irreparable by the Departmental Representative, replace affected item at no additional expense to the Owner.
 - .3 Fabricate large assemblies so they can be safely and easily handled to their place of installation.
 - .4 Store assemblies above ground.

PART 2 – PRODUCTS

- 2.1 Materials**
- .1 All materials shall be as specified on drawings.
 - .2 Metals shall be new and free from defects which may impair their strength, durability or appearance, and shall be alloys of the best commercial quality suitable for the intended use.
 - .3 Metals shall be free of excessive rust, mill scale and spatter, slag, flux deposits and discoloration.
 - .4 RWLs: see *Section 07710 Roof Drains and Rain Water Leaders* for additional related requirements.
- 2.2 Fabrication**
- .1 Work to be carried out by fabricators qualified under CSA requirements.

- .2 Fabricate to size and shape required with sharp lines, smooth surfaces and neat joints.
- .3 Connections to be securely welded, bolted or riveted.
- .4 Fully seal weld exposed exterior work continuously to provide proper weathering. Joints exposed to weather to be watertight (spot welding not acceptable). Grind smooth welds where exposed to view.
- .5 Fabricate curved work to smooth, uniform constant radii as detailed.

2.3 Finish

- .1 Exterior Miscellaneous Metals Elements to be hot dip galvanized to ASTM A123 and CSA G164, 21 oz/3.2 s.f (NOT TO BE CHROMATE PASSIVATED). All Galvanized surfaces exposed to view in the finished condition to be filed smooth. Galvanizing Repair Paint: to be compatible with substrate and with coating system as specified in *Section 09900 Painting* and *Section 09999 Colour and Finish Schedule*.
- .2 Shop Prime all Interior Miscellaneous Metals Elements: Shop Primer CISC/CPMA 2-75.
- .3 All exposed Miscellaneous Metals Elements to receive an additional top coating paint and primer system. Refer to Section 09900 of these specifications for finished paint and primer requirements.
- .4 See *Section 09999 Colour and Finish Schedule*.

PART 3 – EXECUTION

3.1 Installation

- .1 Inspect the work of other sections upon which the work of this section depends. Proceed only after deficiencies, if any, in the work of other sections has been corrected.
- .2 Install all work according to CSA-S16.1.
- .3 Set plumb and true with temporary bracing as required.
- .4 Install required inserts, anchors, bolts, and screws to secure work.
- .5 Joints shall be accurately fitted and rigidly secured to hairline contacts.

3.2 Protection and Clean-up

- .1 Protect work of other sections from damage resulting from work of this section.
- .2 As work proceeds and on completion, remove from premises all surplus materials and debris resulting from work of this section.
- .3 Protect metal against galvanic corrosion where dissimilar metals touch or a flow of water is from one to the other.
- .4 Isolate metals from corrosive agents such as fresh concrete or masonry mortar, plaster, stucco and lumber not fully seasoned.

END OF SECTION

PART 1 - GENERAL

1.1 General

- .1 The "General Conditions" and "Supplementary General Conditions" shall form part of this section.
- .2 Supply all labour, materials and equipment necessary for the fabrication and installation of all guardrails and handrails where shown on drawings, details, and as specified herein.
- .3 Design and fabricate guardrails and handrails in accordance with National Building Code of Canada (NBCC), current edition requirements.
- .4 Submit shop drawings to requirements of *Section 01330 Submittals* and as per General Conditions and Supplementary General Conditions 3.11 prior to commencement of fabrication.
 - .1 Provide detail plans of all different handrail layouts, locations, indicating attachment details to building components and concrete walls.
 - .2 Indicate each type of handrail, pipe and post sizes, profiles, extrusions, method of assembly and anchoring. Indicate hardware, location and sizes of fasteners and finishes. Confirm all dimensions on site.
 - .3 Shop drawings shall be sealed and signed by a Professional Structural Engineer registered in BC. Refer to drawings for specific design requirements.
 - .4 Upon completion of installation of Guards and Handrails, Contractor to supply Letter(s) of Assurance, signed and sealed by a Professional Structural Engineer, registered in BC, indicating compliance of all Guards and Handrails and their installation with NBCC, current edition.
 - .5 Submit Colour Samples minimum 152 x 305mm (6" x 12") for approval by Departmental Representative prior to painting/ installation of guards.

PART 2 - PRODUCTS

2.1 Materials

- .1 Guardrails, handrails and vertical posts and tubes, sizes and profiles conforming to ASTM A53, grade bars indicated on drawings.
- .2 Finish as per *Section 09999 Colour and Finish Schedule*.
- .3 Paint per *Section 09900 Painting*.

PART 3 - EXECUTION

3.1 Fabrication

- .1 Fabricate guards and handrails in accordance with details and reviewed shop drawings; square, true, straight, and accurate to required size, mitre all tube rail corners and reinforce with concealed attachments.

3.2 Installation

- .1 Install closure pieces into ends of tube Handrails.

- .2 Where possible, work to be fitted and shop assembled, ready for site erection.
- .3 Exposed welds to be continuous for length of each joint. File or grind exposed welds smooth and flush.
- .4 Overlapping sleeves used to fasten separate tube handrails sections together will be rejected.
- .5 Install Guardrails and Handrails plumb, level, straight and true, accurately fitted with tight joints and intersections.
- .6 Securely fasten railing posts to structure, countersink all screw heads and touch up paint to match railing finish. Visible pop rivets will be rejected.
- .7 Upon completed installation, touch up all abrasions and clean all glass panels.

END of SECTION

PART 1 - GENERAL

- 1.1 General**
- .1 The "General Conditions" and "Supplementary General Conditions" shall form part of this section.
 - .2 Contractor to refer to Structural Note Sheet.
- 1.2 Reference Standard**
- .1 Do carpentry work in accordance to CAN3-O86.1-M and Part 9 of National Building Code of Canada, current edition, for residential construction, other associated supplements, and as indicated or required.
 - .2 Provide Douglas Fir Plywood Grades CSA O121-M, CSA O151-M Western Softwood Plywood Grades, and Council of Forest Industries of BC 78-276 and 75-227.
 - .3 Wood preservation shall be in accordance with CSA-O80-M standards.

PART 2 - PRODUCTS

- 2.1 Materials**
- .1 See Structural Notes.
 - .2 Damp course shall be 20 kg asphalt felts to CSA A123.3. or 6 mm (1/4") x wall thickness.
 - .3 Weather Barrier shall be as specified under *Section 07250 Weather barrier Membrane*.
 - .4 Vapour Barrier shall be as specified under *Section 07270 Vapour and Moisture Barrier*.
 - .5 Floor sheathing adhesive shall be PL-400 as manufactured by BF Goodrich, or approved equal.
 - .6 Nails shall be to current NBC and Residential Standards. Galvanized nails shall be used for exterior and exposed area application. Nail type, size and spacing shall be as shown on Drawings.
 - .7 Protection board shall be Vibreflex type 70 waterproof protection board.
 - .8 Floor underlayment shall be 9 mm (3/8") particle board such as K3 board by MacMillan Bloedel or equivalent.
 - .9 Wall board and underlayment under ceramic tile to be 12 mm (1/2") Wonderboard as supplied by Cerco Industries.
- 2.2 Pressure Treatment**
- .1 Pressure treated wood shall conform to CSA O322-02 Procedure for Certification of Pressure-Treated Wood Materials for Use in Preserved Wood.
 - .2 Wood preservative shall conform to CSA O80 series of Wood Preservation Standards.
 - .3 All pressure treating to be a copper-based waterborne preservative either: ACQ-C or ACQ-D (Alkaline Copper Quaternary) or CA-B (Copper azole). CCA (Chromated Copper Arsenate) pressure treating shall not be used.
 - .4 Metals used in contact with ACQ pressure treated wood shall be copper, stainless steel (types 304 or 316), hot dip galvanized conforming to ASTM A153. Carbon steel,

- aluminum, red brass and bronze shall not be used in contact with ACQ pressure treated wood.
- .5 Fasteners used with ACQ pressure treated wood shall be copper, stainless steel (types 304 or 316) or hot dip galvanized connectors should be manufactured from steel either galvanized in accordance with ASTM A653, G185 designation, or be galvanized after manufacture in accordance with ASTM A123.
- 2.3 Storage & Handling** .1 See Structural Notes.
- 2.4 Finishes** .1 See *Section 09999 Colour and Finish Schedule*.
- PART 3 - EXECUTION**
- 3.1 Framing**
- .1 Framing to be cut square, closely fitted and accurately set to all lines and levels, and set plumb.
- .2 Lumber in contact with concrete shall be preservative treated and laid on dampcourse to width of plates.
- .3 Framing members to be framed, anchored, fastened, tied, braced together providing strength and rigidity necessary for use.
- .4 All columns, posts shall be anchored with steel connections to resist uplift and lateral movement.
- .5 Notching, drilling of framing members will not be allowed without approval by the Departmental Representative, except as indicated on the drawings.
- .6 Nails shall be long enough that half their length penetrates second member. Stagger nails in direction of grain, keep nails well in from edges.
- .7 Beams shall have at least 100 mm (4") bearing at end supports.
- .8 Framing under built-up beams shall have studs or cripples for support, equal in number to the built-up beam or as indicated.
- 3.2 Floor Joists**
- .1 Set joists with crown up and reject twisted joists. Provide minimum 50 mm (2") bearing on plates, beams or joist hangers.
- .2 Provide blocking for end supports and bridging as indicated. Framing to openings shall be as noted on the Drawings. Joists to be bridged at intervals of 2.1 m (7') maximum.
- 3.3 Wall Studs**
- .1 Wall studs shall not be spliced unless indicated or approved by Departmental Representative.
- .2 Load-bearing stud walls shall have a maximum notch depth less than one-third (1/3) the total depth.
- .3 Non load-bearing stud walls shall have a minimum of 40 mm (1 1/2") depth remaining after notch cut or they shall be reinforced.

- .4 Wall framing shall have corners and intersections framed with three studs; other openings to be framed with double studs. Wall plates shall be the same size as studs, unless otherwise indicated, and will include one bottom plate and two top plates, except where wall contains a continuous lintel or wall is non load-bearing. Joints in wall top plates to be staggered at least one stud space. Top plates in load-bearing walls shall not be notched, drilled, or reduced in depth to less than 50 mm (2") unless suitably reinforced.
- 3.4 Sheathing**
- .1 Roof and wall sheathing shall be applied to structural members using nails and minimum spacing as shown on drawings.
- .2 Floor sheathing shall be glued and nailed using continuous glue bead on all joists and ring nails. Install sheathing face grain at right angles to floor joists. Nail plywood using nails with minimum nailing as shown on drawings.
- .3 Underlayment to be installed at right angles to plywood sub-floor.
- 3.5 Strapping**
- .1 Provide solid strapping at points for fastening other finishes, joints, equipment, and fixtures as required.
- .2 Finished strapping surfaces to be plumb, level, square, and true, measured with 2100 mm (7') long straight edge, wedge as required. Block edges of all panel surfaces around all projections.
- 3.6 Lintels**
- .1 Lintels to be two or more pieces of 38 mm x 235 mm (2" x 10") lumber separated with spacers to width of studs, and nailed together as one unit. Bear minimum 30 mm (1 1/4") on cripples. Refer to drawings.
- 3.7 Furring and Blocking**
- .1 Services, piping, ductwork, and other items projecting from finished surfaces shall be furred out as required. Furring to be a minimum of 38 mm x 38 mm (2" x 2") at 400 mm (16") centres.
- .2 Install furring and blocking as required to space-out and support casework, cabinets, bumper rails, wood doors and frames, coat hook, mirrors, grab bars, washroom accessories, toilet partitions, handrails, chalk and tackboards, facings, wall and ceiling finishes, fascia, soffit, siding and other work as required. Refer to drawings for additional blocking and furring.
- .3 Align and plumb faces of furring and blocking to tolerance of 1:600.
- .4 Install rough bucks, nailers and linings to grounds and rough openings as required to provide backing for frames and other work.

- 3.8 Weather Barrier** .1 Cover exterior wall sheathing with specified Weather Barrier. Refer to Section 07250.
- 3.9 Vapour Barrier** .1 Install Vapour Barrier as per Section 07270.
- 3.10 Protection Board** .1 Install over waterproofing membranes, butt boards tight and stagger joints.
- 3.11 Cants, Curbs, Nailers Backing** .1 Install wood cants, wood backing, fascia backing, nailers, curbs and other wood supports as required (whether shown or not shown in the drawings) and secure using galvanized steel fasteners.
- 3.12 Sleepers** .1 Install sleepers as indicated on the drawings.
- 3.13 Fasteners** .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.
- 3.14 Electrical Equipment Backboard** .1 Provide ULC Listed Pressure Impregnated Fire Retardant Treated 19 mm thick plywood backboards for mounting behind all electrical equipment. Use 19 mm thick plywood on 19 x 38 mm furring around perimeter and at maximum 300 mm intermediate spacing.
- 3.15 Poly Plate** .1 Install strips of 6 mil Polyethylene Vapour Barrier (see Section 07270) over, under or around all framing members as necessary. Provide minimum 150 mm (6") flap to ensure continuity of final Vapour Barrier installation.

END OF SECTION

PART 1 - GENERAL

- 1.1 General** .1 The "General Conditions" and "Supplementary General Conditions" shall form part of this section.
- 1.2 Scope of Work** .1 The Supplier is responsible for the design, supply and installation review of the proprietary structural wood products.
- 1.3 Reference Standards** .1 Design wood products in accordance with:
1) Part 4 of the National Building Code of Canada, current edition.
2) CSA Standard 086 Engineering Design in Wood (LSD).
3) Design loads and design criteria as indicated on the Structural Drawings.
.2 Manufacture and evaluate wood I-joists in accordance with ASTM Standard D5055.
- 1.4 Alternates** .1 Submit all alternate framing layouts and/or products to Departmental Representative in writing for review.
- 1.5 Connections** .1 Supplier to design and supply all steel connections between:
1) Wood products to wood products,
2) Wood products to supporting structure, and
3) As indicated on the Structural Drawings.

PART 2 - PRODUCTS

- 2.1 General** .1 Wood products to meet manufacturer's standards and specifications.
.2 Wood products to meet fire assemblies rating required for the system.
- 2.2 Lumber** .1 Lumber shall be identified to meet National Lumber Grading Authority standards.
- 2.3 Connectors** .1 Connecting plates to be tested in accordance with CAN/CSA S347.

PART 3 - EXECUTION

- 3.1 Shop Drawings** .1 Submit complete set of Shop Drawings to the Departmental Representative for review and comment at least four (4) weeks prior to fabrication per Submittals *Section 1330 Submittals* and Structural Drawings.
.2 Incomplete sets of Shop Drawings will not be accepted.
.3 Shop Drawings to include but not be limited by:
.1 Layout plan showing location of materials, bearing conditions, design loads including snow drift diagrams and relevant dimensions.

- .2 Detailed design/fabrication Shop Drawing(s) of each member clearly showing design loads, member forces, deflections, camber, bearing details, lateral bracing, etc.
- .3 Connection details showing design load capacity and installation details.
- .4 Installation/erection instructions and details.
- .5 Shipping sheet indicating quantity of material types, connections and accessories.
- .4 All pages of the Shop Drawings to be signed and sealed by a Professional Engineer registered in the Province of BC.

3.2 Delivery and Storage

- .1 Deliver and store materials on site in a safe manner protected against weather and in accordance with manufacturer's instructions.

3.3 Installation

- .1 Install wood products in accordance with the Shop Drawings and Supplier's specifications.
- .2 All proposed site modifications and/or damage to the wood products are to be reviewed by the Supplier's Engineer, who shall issue written instructions and repair details as required. Notify Departmental Representative accordingly.
- .3 Installation of wood products to be reviewed on site by the Supplier.
- .4 Supplier to submit a letter signed and sealed by a Professional Engineer registered in B.C. confirming that the wood products have been installed in general conformance to the Supplier's Shop Drawings and Specifications.

END OF SECTION

PART 1 - GENERAL

- 1.1 General** .1 The "General Conditions" and "Supplementary General Conditions" shall form part of this section.
- 1.2 Reference Standards** .1 Refer also to General Structural Notes.
.2 Prefabricated wood trusses for houses and small buildings shall be tested in accordance with CSA S307.
.3 CAN/CSA-080 - Series-M, Wood Preservation.
- 1.3 Quality Control** .1 Truss fabricator must have an ongoing quality control program in place. The truss plant must be inspected by an independent inspection agency a minimum of four times per year. Plant inspection reports are to be made available to the Departmental Representative upon request.

PART 2 - PRODUCTS

- 2.1 General** .1 Prefabricated products type, spacing, and design criteria to be as specified on drawings or approved alternatives.
.2 Products to meet fire assemblies rating required for the system.
- 2.2 Lumber** .1 Identify lumber by grade stamp of an agency certified by Canadian Lumber Standards Administration Board.
- 2.3 Connectors** .1 See General Structural Notes.

PART 3 - EXECUTION

- 3.1 Shop Drawings** .1 Refer to General Structural Notes. Submittals as per *Section 01330 Submittals*.
.2 All non-uniform loads to be graphically shown on individual truss drawings.
- 3.2 Fabrication** .1 All fabricated units shall be in accordance with Departmental Representative's reviewed shop drawings.
.2 Overframing to be done with valley sets @ 24" o/c, unless noted otherwise. Valley sets to be supported by continuous 2x4 blocking. Valley set connection details to be provided by fabricator.
.3 Trusses to be cambered for 1/2 live load and full dead load. Trusses with more than two bearing points to be fabricated with no camber for level bearing.
.4 General contractor to coordinate all mechanical loads, duct openings, curb sizes, hung unit and roof top unit locations and loads with the truss fabricator and mechanical contractor prior to shop drawing submittal.

- 3.3 Delivery and Storage** .1 Store products on site in accordance with manufacturer's instructions. Provide bearing supports and bracing. Prevent bending, warping and overturning of trusses.
- 3.4 Installation**
- .1 Products to be installed strictly in accordance with the reviewed shop drawings. Locate all bracing, bridging, cripples, blocking, etc. as shown on the reviewed shop drawings.
 - .2 Product's installation to be reviewed by manufacturer's Specialty Structural Engineer, who shall submit Schedules S-B and S-C to the Departmental Representative.
 - .3 Provide temporary bracing as indicated on shop drawings and in accordance with WCB regulations until permanent bracing are installed.
 - .4 Do not cut or remove any whole or portion of prefabricated product and accessories without approval of Departmental Representative.
 - .5 Provide connectors as shown on the Departmental Representative's drawings and manufacturer's shop drawings.
 - .6 See General Structural Notes for additional requirements.

END of SECTION

PART 1 - GENERAL

- 1.1 General** .1 The "General Conditions" and "Supplementary General Conditions" shall form part of this section.
- 1.2 Reference Standards** .1 Design and fabricate products to meet CSA 086.1 standards as well as Part 4 of National Building Code of Canada, latest edition, covering residential structures.
.2 Pre-fabricated wood trusses shall be tested in accordance with CSA S307.

PART 2 - PRODUCTS

- 2.1 General** .1 Pre-fabricated products type, spacings, design criteria to be as specified on drawings or approved alternatives.
.2 Products to meet manufacturer's standards.
.3 Products to meet fire assemblies rating required for the system.
- 2.2 Lumber** .1 Lumber shall be identified to meet National Lumber Grading Authority standards.
- 2.3 Connectors** .1 Connecting plates to be tested in accordance with CSA S347.

PART 3 - EXECUTION

- 3.1 Shop Drawings** .1 Submit three (3) sets of shop drawings for review by the Departmental Representative prior to fabrication. Shop drawings to show dimensions, camber, connections, bracing, erection details, design loads, depths, spacings, bearing details and other information relevant to the design and installation of the products.
.2 Do not fabricate products until the shop drawings have been reviewed by the Departmental Representative.
.3 All pages of the shop drawings to be signed and sealed by a Professional Engineer registered in the Province of B.C.
- 3.2 Delivery and Storage** .1 Store products on site in accordance with manufacturer's instructions.
- 3.3 Installation** .1 Products to be installed strictly in accordance with the reviewed shop drawings. Locate all bracings, bridging, cripples, blockings, etc. as shown on the reviewed shop drawings.
.2 Products installation to be reviewed by manufacturers representative when required by Departmental Representative.
.3 Provide temporary bracings as indicated on shop drawings until permanent bracings are installed.

- .4 Do not cut or remove any whole or portion of prefabricated product and accessories without approval of the manufacturer and Departmental Representative.
- .5 Provide connectors as shown on the Consultant's drawings and manufacturer's shop drawings.

END of SECTION

PART 1 - GENERAL

- 1.1 General** .1 The "General Conditions" and "Supplementary General Conditions" shall form part of this section.
- 1.2 Reference Standards** .1 Architectural Woodwork Manufacturers Association of Canada (AWMAC), 2003.
.2 N.L.G.A. Standard Grading Rules for Canadian Lumber.
- 1.3 Samples** .1 Submit duplicate 600 x 600mm (in duplicate) samples of each type of paneling and each type of solid wood or plywood to receive stain or natural finish as required by the Consultant.
.2 Submit duplicate 600mm long samples of each type of siding trim and moulding as required by the Consultant.
.3 Samples shall provide a full range of colour, texture, pattern and graining which will allow the Consultant to make a selection of the materials to be used on the project.
- 1.4 Submittals** .1 Shop drawings shall be prepared and submitted for review to the Consultant, as per *Section 01330 Submittals*.

PART 2 - PRODUCTS

- 2.1 Materials** .1 Lumber shall be to the quality standards of the AWMAC and shall be kiln dried to a moisture content of 6% to 12%.
.2 Finish lumber, moldings and trims to be smoothly machined and sanded to the sizes indicated, and to AWMAC Custom grade.
.3 Sizes and species of moldings and trims to be as indicated on the drawings.

PART 3 - EXECUTION

- 3.1 Workmanship** .1 Workmanship shall be of high standard, requiring neat flush surfaces where faces meet, plumb and level construction with all exposed corners mitred or housed. Ease all sharp corners and scarf joint all running mouldings. Remove all marks and blemishes fill as required. Machine sand and hand dress to smooth finish.
.2 Joints shall be tight, glued where necessary and formed to conceal or permit shrinkage or expansion without warping, splitting or buckling.
.3 Mouldings members, trims, facings etc. shall be mitred or coped at corners.
.4 Conceal all fastenings, fill and set nails if face nailed. Use only galvanized nails or screws for exterior work. Exposed nailing shall be narrow line staples, or T Nails or finishing nails, all properly set, filled and sanded.
.5 Sanding shall be with the grain, 200 sandpaper with no cross scratches.

- .6 Exposed edge grain of plywoods is not acceptable. Trim edges with hardwood as required.
- .7 Installation and handling shall be carefully performed, and any defaced material shall be replaced at the expense of the Contractor. Work to be neat, free from defects, straight, level and plumb.

END of SECTION

PART 1 - GENERAL

- 1.1 General** .1 The "General Conditions" and "Supplementary General Conditions" shall form part of this section.
- 1.2 Reference Standards** .1 The Quality Standards for Architectural Woodwork by the Architectural Woodwork Manufacturers of Canada (AWMAC), 2009 Edition, hereafter referred to as the Manual, together with authorized additions and amendments, shall be used as a reference standard and shall form part of this project specification.
- .2 Where modifications to the AWMAC Quality Standards contained within the Manual are included in this project specification, then such modifications shall govern in case of conflict.
- .3 Any reference to Custom or Premium grade in this specification shall be as defined in the Manual.
- .4 Any item not given a specific quality grade shall be Custom grade as defined in the Manual.
- .5 A copy of the AWMAC Quality Standards Manual shall be made readily available at all times on the job site for reference.
- .6 All architectural woodwork to be used in the project shall meet the requirements of the AWMAC Quality Standards Manual.
- .7 Industrial Grade Medium Density Fiberboard (MDF) manufactured with a formaldehyde-free adhesive system and which meets the physical properties of ANSI A208.2-2009 Grade 130 specifications.
- 1.3 Submittals** .1 Shop drawings:
- .1 Shop drawings for architectural woodwork shall be prepared and submitted for review to the Departmental Representative, as per Section 01330.
- .2 Shop drawings shall show construction details of all architectural woodwork and general arrangements; typical and special installation conditions; materials being supplied and all connections, attachments, anchorage and location of exposed fastenings, as applicable.
- .3 Shop drawings shall incorporate plans, elevations, sections, and details for all architectural woodwork. The details shall show and specify all thicknesses, types and finishes, and all cabinet hardware.
- .4 No work shall be fabricated until the shop drawings have been reviewed and all other related submittals and samples as required by the specifications, have been approved by the Departmental Representative.
- .2 Samples:
- .1 Submit samples, 625 square centimeters (100 square inches) (in duplicate) of each wood species which is to receive finish at the job site, to the Departmental Representative for approval.

- .2 Submit finished samples, 625 square centimeters (100 square inches) (in duplicate) of each finish to be applied at the factory, to the Departmental Representative for approval.
 - .3 Provide written confirmation on the shop drawings that all MDF used is formaldehyde-free.
- 1.4 Product Handling and Storage**
- .1 The Architectural Woodwork Manufacturer shall be responsible for making certain that the work in this Section is not delivered until the building and storage areas are sufficiently dry so that the architectural woodwork will not be damaged by excessive changes in moisture content.
 - .2 Architectural woodwork delivery, storage, and handling shall be in accordance with the AWMAC Manual.
 - .3 Delivered materials which are damaged in any way or do not comply with these specifications will be rejected by the Departmental Representative and shall be removed from the job site and replaced with acceptable materials.
- 1.7 Guarantee**
- .1 The Manufacturer shall provide a two-year Guarantee. The Guarantee shall cover replacing and refinishing to make good any defects in architectural woodwork due to faulty workmanship or defective materials supplied by the Trade Contractor, which appear during the two-year period following the date of Substantial Performance of the project.

PART 2 - PRODUCTS

2.1 Materials

- .1 Millwork Shelving and Cabinetry Exposed Parts:
 - .1 Doors & Drawer Fronts: MDF w/ plastic laminate finish as indicated on Drawings.
 - .2 Edging on doors & drawer fronts: Plastic Laminate edge strip.
 - .3 All other exposed parts (open casework shelves & bodies): MDF w/ plastic laminate as indicated on Drawings.
 - .4 Colour & finish to be determined by Departmental Representative.
- .2 Semi-Exposed Parts:
 - .1 19mm (3/4") white melamine as indicated on drawing.
 - .2 Edging: white melamine.
- .3 Core Material:
 - .1 19mm (3/4") white melamine to thickness indicated unless noted otherwise.
- .4 Plastic Laminate:
 - .1 As per *Section 06415 Plastic Laminates*.
- .5 Nails and Staples:
 - .1 To CSA B111-1974 plain finish
- .6 Hardware:
 - .1 To CGSB 69-GP-8A

.2 Hardware finish to be as per *Section 08700 Finish Hardware*.

2.2 Fabrication

- .1 Fabricate all items to AWMAC construction Custom Grade. Obtain site verified dimensions prior to fabrication.
- .2 Cabinet doors, front and drawers: 19mm thick, flush style.
- .3 Set nails and screws, apply plain wood filler to indentations, sand smooth and leave ready to receive finish.
- .4 Shop install cabinet hardware for doors, shelves and drawers.
- .5 Shelving in cabinetwork to be adjustable unless otherwise noted.
- .6 Cutouts for plumbing fixtures, inserts, appliances, outlet boxes and other fixtures to be coordinated with mechanical and electrical.
- .7 Provide minimum 3 mm hardwood strip on plywood edges 12 mm or thicker unless noted otherwise on the drawings, exposed in final assembly.
- .8 At cabinet door + drawers, provide 3 mm thick solid hardwood strip on exposed edges. Edging to be same width as core material. All items to be shop finished to Section 09999.
- .9 Hardwood strip finished to match adjacent material.
- .10 Shop assemble work for delivery to site in size easily handled and to ensure passage through building openings.

2.3 Hardware

- .1 Concealed metal fully adjustable hinges, self-closing, 170, Blum or equivalent.
- .2 Metal drawer slides (one to each side of drawer rated capacity of 16 kg (35 lbs.) per pair): Blum 230.
- .3 File drawer slides, full extension (one each side of drawer): Accuride 3832A, or equivalent.
- .4 Door and drawer pulls: 'D' - pulls. 4" mortise handle.
- .5 Cabinet, counter drawer and door locks type: Richelieu camlock 310-151.195. Coordinate sets of locks to have different keys.
- .6 Coat Hooks – selection by the Departmental Representative.

2.4 Fastenings

- .1 Supply screws, bolts, expansion shields and other fastening devices required for satisfactory installations.
- .2 No exposed fastening on primary surfaces. Exposed Fastening devices within cabinetry to match finish of hardware.

2.5 Counter Tops

- .1 Counter tops to be seamless, site measured, pre-finished.
- .2 Sink and cook top cutouts may be done on site with template.
- .3 Scribe and caulk to wall surfaces as required.

PART 3 - EXECUTION

3.1 Installation

- .1 As a minimum, install all items specified herein as per the AWMAC Manual.
- .2 Set and secure all materials and components in place, rigid, plumb and square.
- .3 Provide heavy duty fixture attachments for all cabinets.
- .4 Use draw bolts in counter top joints.
- .5 At junction of plastic laminate counter back splash and adjacent wall finishes, apply small bead of sealant.
- .6 After installation, fit and adjust operating hardware for doors, drawers and shelves.

END of SECTION

PART 1 - GENERAL

1.1 Air/Vapour Barriers

- .1 Refer to Assemblies Drawing for thickness of vapour barrier. All Contractors and all Subcontractors and trades shall conform to the following requirements to maintain and protect the continuity and integrity of the building air/vapour barriers:
- .2 The vapour barrier is an integral part of the building thermal enclosure and must be maintained intact and continuous on the interior (warm) side of all exterior insulated walls, soffits, overhangs, roofs.
- .3 The vapour barrier membrane is a moisture impermeable sheet and must be maintained in tight physical contact with the interior (warm) side of the building enclosure insulation and must be sealed air and vapour tight to all designed openings and penetrations and to all other building vapour barrier systems, to provide a complete envelope around the building.
- .4 The air barrier is a physically strong and sound barrier, which is not necessarily vapour resistant, designed to resist air movement into or out of a building enclosure and must be able to resist high air pressures without tearing, rupturing or breaking away from it fastening. The air barrier is not the vapour barrier.
- .5 The air/vapour barriers must be maintained across all expansion and control joints whether indicated and designed or not.
- .6 All Contractors and Subcontractors and any persons on-site must take all necessary precautions not to puncture, tear, weaken or damage in any way the air/vapour barrier membrane. Any damage shall be sealed to the Departmental Representative's approval.
- .7 The vapour barrier membrane must always be protected from the cold in the final building by insulation.
- .8 Refer to the following sections for specific requirements and any field-testing:
 - .1 *Submittals* *Section 01330*
 - .2 *Weather Barrier* *Section 07250*
 - .3 *Vapour Barrier* *Section 07270*

1.2 Fire Separations

- .1 All Contractors and all Subcontractors and trades shall conform to the following requirements to maintain and protect the continuity and integrity of the fire separations whether or not shown on the Drawings:
- .2 Fire separations may not be pierced by back-to-back electrical or similar service outlets or equipment.
- .3 Combustible construction that abuts on or is supported by a non-combustible fire separation shall be constructed so that its collapse under fire conditions will not cause the collapse of the fire separation.
- .4 Where a fire separation required to be a non-combustible construction terminates at the exterior wall, the underside of

floor, ceiling or roof structures and at floors, the opening shall be firestopped with non-combustible material such as sheet metal, ULC approved and labeled sealants or approved ULC approved insulation as specified.

- .5 Combustible members, fastenings, and the like shall not be used to anchor fixtures to fire separations.
- .6 Openings for non-combustible pipes and ducts shall be tightly fitted and firestopped to prevent the passage of smoke and flame. Subcontractors shall be responsible for ensuring that when their Work passes through a fire separation, the opening shall be fire stopped with ULC labeled and approved firestopping assembly materials including sealants, insulants or other material assemblies approved by ULC listings and/or local authorities having jurisdiction to maintain the integrity of the fire separation.

END OF SECTION

PART 1 - GENERAL

- 1.1 General** .1 The "General Conditions" and "Supplementary General Conditions" shall form part of this section.
- 1.2 Handling and Storage of Materials**
- .1 Store packaged material in original undamaged containers with manufacturers labels and seals intact. Deliver to site in sealed packages.
- .2 Store packaged materials, and manufactured items off the ground and cover with weatherproof covering. Stack units to permit air circulation.
- .3 Prevent damage to materials during handling, storing and installation. Damaged materials will be rejected. Immediately remove rejected materials from site and replace at no expense to the Owner.
- 1.3 Co-Operation**
- .1 Give timely instructions and information in writing of requirements for surfaces, materials or inserts prepared or supplied which affect work of others.
- .2 Do not leave polystyrene or polyisocyanurate insulation exposed to sunlight or UV degradation, cover immediately after installation and maintain manufacturer's recommended storage requirements throughout the project.
- .3 Where anchors, inserts, reglets and accessories affect the work of other forces provide assistance and install such items where necessary.
- .4 Ensure that flammable insulation is not exposed to the interior. Minimum cover: 20 mm (3/4") plaster or 16 mm (5/8") gypsum board.
- 1.4 Reference Standards**
- .1 National Building Code of Canada, current edition.
- .2 To CAN/ULC-S701-05 Polystyrene,
- .3 To CAN/ULC-S702-97 Semi Rigid Mineral Fibre,
- .4 To CAN/ULC-S704-11 Polyurethane, Polyisocyanurate, Boards, Faced,
- .5 To CAN/ULC-S705.1-01 & CAN/ULC-S705.2-05 Spray Applied Rigid Polyurethane Foam, Medium Density, Application
- 1.5 Delivery & Storage** .1 All materials shall be delivered and stored on-site in their original bags, packages and containers clearly identified for their manufacturer, thickness, type, installation location and all other pertinent information.

PART 2 - PRODUCTS

- 2.1 Materials** .1 Semi Rigid Insulation (Exterior Cavity of Above Grade Walls):
Exterior Continuous Wall Insulation: Semi-rigid insulation board CAN/ULC-S702-97, Type 1, and CAN/ULC S102 R-6 value with a density of 70 kg/m³ to ASTM C612-10

for basalt rock and steel slag mineral fibre insulation, R-value indicated on assembly drawing Acceptable product: Rockwool Cavityrock or approved alternative.

- .2 Batt Insulation (Exterior Wall Stud cavities):
Fibrous glass insulation, formaldehyde free, friction fit pre-formed type CSA A101, Type 1A resistance value, fill wall cavities completely, R-value as per drawings. Acceptable Products: Owens Corning EcoTouch Fiberglass Insulation.
- .3 Acoustic Batt Insulation (Interior Partition Walls and Ceiling. For location See the drawings):
Acoustic Fiberglass Batt Insulation, Formaldehyde Free, Friction fit pre-formed Type CAN/ULC-S702-97, ceiling thickness as indicated on drawings; fill interior wall cavities. Acceptable Products Owens Corning EcoTouch QuiteZone Fiberglass Acoustic Batt.
- .4 Adhesive and fastening shall be as recommended by the insulation manufacturer, and materially compatible with adjacent membranes and surfaces for application in the corresponding vertical or horizontal plane.

PART 3 - EXECUTION

3.1 Preparation

- .1 Examine surfaces for insulation application, and immediately inform the Departmental Representative in writing of any defects that would affect the installation of the insulation. Ensure all poly plate vapour barriers have been installed as per *Section 07270 Vapour and Moisture Barrier*.
- .2 Ensure all air seals and vapour barriers are in place and adhered to substrata, prior to installation of board insulation.

3.2 Installation

- .1 Semi Rigid Insulation:
 - .1 Cover on warm side with minimum 6 mil polyethylene, tape joints with pressure sensitive tape.
 - .2 Do not compress insulation to fit spaces. Pack semi rigid insulation completely and continuously to all rough openings in the exterior walls including windows, door frames, louvers and grilles. Cut and fit all insulation around and to all vertical and horizontal spaces. Upon review, Departmental Representative will give his approval to the fit-up and all other similar situations shall be done in a like manner.
 - .3 Install insulation to maintain continuity of thermal protection to building elements and spaces.
 - .4 Fit insulation tight around electrical boxes, plumbing and heating pipes and ducts, around exterior doors and windows and other protrusions.

- .5 Keep insulation minimum 75 mm (3") from heat emitting devices such as recessed light fixtures.
- .2 Batt and Acoustic Batt:
 - .1 As per manufacturer requirements.
- .3 Building to be enclosed prior to execution of interior batt insulation.
- .4 The Contractor shall request a Field Review of the Insulation by the Departmental Representative prior to concealment.

3.3 Sealants

- .1 Apply sealants to the periphery of all openings as indicated, required or directed by Departmental Representative.

3.4 Sound Proofing

- .1 Acoustic insulation described above: refer to the drawings for the location and extent.

END of SECTION

PART 1 - GENERAL

- 1.1 General** .1 The "General Conditions" and "Supplementary General Conditions", Division One General Requirements, Specifications and drawings shall form part of this section.
- 1.2 Standards** .1 National Building Code of Canada, current edition.
.2 CAN/CGSB-51.32-M77.
- 1.3 Quality Assurance** .1 Installer shall have min. (3) years experience with installation of commercial weather barrier assembly.
.2 Installation shall be in accordance with weather barrier manufacturer's installation guidelines and recommendations.
.3 Provide commercial weather barrier and accessory material produced by single manufacturer.
.4 Contractors shall review with installer and weather barrier manufacturer's Designated Rep all related project requirements and related specifications, and coordinate methods, procedures and sequencing requirements for full and proper installation, integration and protection. Any area of potential conflict and interface shall be brought to the Departmental Representative's attention.
- 1.3 Handling and Storage** .1 Store packaged material in original undamaged containers with manufacturers labels and seals intact. Deliver to site in sealed packages.
.2 Store packaged materials, and manufactured items off the ground and cover with weatherproof covering. Stack units to permit air circulation, and any additional storage recommendation by weather barrier manufacturer.
.3 Prevent damage to materials during handling, storing and erection and until final incorporation into completed wall assembly. Damaged materials will be rejected. Immediately remove rejected materials from site and replace at no expense to the Owner.

PART 2 - PRODUCTS

- 2.1 Manufacturer** .1 DuPont or approved alternate.
- 2.2 Materials** .1 DuPont Tyvek® CommercialWrap and related assembly components:
.2 All accessories, including seam tape, fasteners, sealants, and adhesive, primers etc shall strictly follow membrane manufacturer's specifications and instructions.

PART 3 - EXECUTION

- 3.1 Installation**
- .1 Install Tyvek weather barrier over exterior wall sheathing substrate in accordance with manufacturer recommendations.
 - .2 Install weather barrier membrane prior to installation of windows and doors. Coordinate work with window and door Self Adhered membrane flashings.
 - .3 Start weather barrier installation at a building corner, leaving 150mm – 305mm (6-12 inches) of weather barrier extended beyond corner to overlap.
 - .4 Install weather barrier in a horizontal manner starting at the lower portion of the wall surface with subsequent layers installed in a shingling manner to overlap lower layers. Maintain weather barrier plumb and level.
 - .5 Sill plate Interface: Extend lower edge of weather barrier over sill plate interface 3 to 6". Secure to foundation with elastomeric sealant as recommended by weather barrier manufacturer.
 - .6 Overlap weather barrier min 305mm (12") at exterior corners, and min 150mm (6") at all seams.
 - .7 Preparation and installation around windows and door openings shall strictly follow membrane manufacturer's instructions.
 - .8 The Contractor shall request a Field Review of the weather barrier membrane by the Departmental Representative prior to concealment.

END OF SECTION

PART 1 - GENERAL

- 1.1 General** .1 The "General Conditions" and "Supplementary General Conditions" shall form part of this section.
- 1.2 Handling and Storage of Materials**
- .1 Store packaged material in original undamaged containers with manufacturers labels and seals intact. Deliver to site in sealed packages.
- .2 Store packaged materials, and manufactured items off the ground and cover with weatherproof covering. Stack units to permit air circulation.
- .3 Prevent damage to materials during handling, storing and erection. Damaged materials will be rejected. Immediately remove rejected materials from site and replace at no expense to the Owner.
- 1.3 Co-Operation** .1 Give timely instructions and information in writing of requirements for surfaces, materials or inserts prepared or supplied which affect work of others.
- 1.4 Reference Standards**
- .1 National Building Code of Canada, current edition.
- .2 National Research Council's Measure for Energy Conservation in New Buildings.
- .3 CAN/CGSB-51.33-M89 and CAN/CGSB 51.34-M86.
- .4 Have an air leakage characteristic not greater than 0.02 L(s*m2) measured at an air pressure difference of 75 Pa. (for air barrier).

PART 2 - PRODUCTS

- 2.1 Materials**
- .1 Vapour Barrier: Where indicated or required use clear polyethylene sheet to CAN/CGSB-51.33-M89, Type 1. Tape as recommended by manufacturer.
- .2 Tape and Sealants shall be as recommended by the vapour barrier manufacturer.
- .3 Self-Adhesive membrane flashings shall be Sopraseal Stick 1100 or Henry (Bakor) Blueskin "SA" air/ vapour barrier membrane composed of bitumen modified with thermoplastic polymers and high-density polyethylene or approved alternate.
- 2.2 Accessories** .1 As recommended by the Vapour Barrier Manufacturer:
- .1 Joint sealing tape.
- .2 Sealant.
- .3 Staples.

PART 3 - EXECUTION

- 3.1 Preparation** .1 Examine surfaces for vapour barrier application, and immediately inform the Departmental Representative in writing of any defects that would affect the installation of the vapour

barrier. Ensure all poly plate vapour barriers have been installed as per *Section 06100 Rough Carpentry and Framing*.

3.2 Installation

- .1 Unless otherwise specified apply vapour barrier membrane to warm side of insulation for exterior walls, using wide pieces to result in fewest joints possible. Make lap joints over solid bearing and lap minimum 100 mm (4"), sealing each joint between layers with a continuous bead of acoustical sealant or pressure sensitive tape. Fasten in position at no more than 200 mm (8") o/c. on all edges and at intermediate locations.
- .2 Provide seal around projecting and penetrating objects, tape membrane in position using pressure sensitive tape.
- .3 Inspect sheets for continuity. Repair damaged, torn or perforated membrane with pressure sensitive tape recommended for purpose by tape manufacturer, unless, in opinion of Departmental Representative, damage is too great to be repaired, in which case provide new undamaged membrane. Stapling of strips of membrane for purposes of sealing not permitted.
- .4 Self-Adhesive Membrane: Apply membrane to a clean, primed surface as per manufacturer's recommendations. Press firmly with a roller after membrane as been installed into place. Do not allow membranes to be exposed to UV, Sun or Weather limiting exposure periods to those stated in the manufacturers written instructions.

3.4 Sealants

- .1 Apply sealants to the periphery of all openings as indicated, required or directed by Departmental Representative.

3.4 Review

- .1 The Contractor shall request a Field Review of the Vapour Barrier by the Departmental Representative prior to concealment.

END of SECTION

PART 1 - GENERAL

- 1.1 General** .1 The "General Conditions" and "Supplementary General Conditions" shall form part of this section.
- 1.2 Description** .1 Submit shop drawings and samples for review in accordance with *Section 01330 Submittals*.
.2 Include manufacturer's maintenance instructions in the Operations/Maintenance Manuals as outlined in *Section 01770 Closeout Procedures*.
.3 Provide 5-year RCABC warranty for all building roofs.
- 1.3 Quality Assurance** .1 Conform to the latest Guarantee Standards of RGC as published in the "RCABC Roofing Practices Manual".
- 1.4 Inspection and Warranty** .1 Provide a manufacturer's written warranty covering failure of factory-applied exterior finish within the warranty period of 20 years after date of Substantial Completion.
.2 Perform using an independent inspection company acceptable to RCABC.
.3 Inspection costs paid for directly by the Roofing Contractor.
.4 Provide to the Owner the "Roofing System Record" and "Material Safety Data Sheets" upon completion of this contract.
.5 Manufacturer's Total Systems Warranty covering all components of the roofing system. Roofing Contractor shall supply Owner with a separate workmanship warranty. In the event any work related to roofing, flashing, or metal is found to be within the Roofing Contractor's warranty term, defective or otherwise not in accordance with Contract Documents, the Roofing Contractor shall repair that defect at no cost to the Owner. Roofing Contractor's warranty obligation shall run directly to Owner and be in effect for a five (5) year duration.

PART 2 - PRODUCTS

- 2.1 Material** .1 Acceptable products, Asphalt Shingles:
.1 Malarkey "The Alaskan AB" 3-Section SBS or approved alternate by Departmental Representative, RCABC approved shingle for low slope application.
.2 Continous Self-Adhered Bitminuous Underlayment material, RCABC approved product for low slope asphalt shingle application.
.3 "Flashings and break shapes to be as per *Section 07620 Metal Flashing and Trim*.
.4 Fasteners: As per manufacturer's recommendation and engineer's specification. All fasteners to be concealed.

- .5 Provide all other materials not specifically described but required for a complete and proper installation of the work.
- .6 Colour as per *Section 09999 Colour and Finish Schedule*.

PART 3 - EXECUTION

3.1

- .1 Do not allow roofing materials to become twisted or distorted during handling operations. Protect cladding materials against discoloration.
- .2 Apply and erect in strict accordance with manufacturer's instruction with regard to spacing of fasteners, dimensions of overlaps and all other aspects of installation. Cut and flash all openings indicated on drawings and to provide weather tight installation.
- .3 Install cladding with provision for expansion and contraction.
- .4 Perform site cutting to not show rough or jagged edges.
- .5 Finished appearance to be free of debris, stains or distorted appearance.

END of SECTION

PART 1 - GENERAL

- 1.1 General** .1 The “General Conditions” and “Supplementary General Conditions” shall form part of this section.
- 1.2 Standards** .1 National Building Code of Canada, current edition.
.2 All material to N.L.G.A. Standard Grading Rules for Canadian lumber.
- 1.3 Submittals** .1 Submit 24” (600 mm) lengths of all cladding material for review to Departmental Representative.
.2 Submit copy of specifications, installation data and other pertinent manufacturer’s literature.
.3 Mock-up:
.1 Provide a 4’x8’ (1200x2400mm) ‘built-in-place’ corner installation demonstrating pattern and trim for Departmental Representative review prior to commencement of the work. Mock-up location as directed by the Departmental Representative.
.2 Mock-up to serves as aesthetic standard for stone veneer and stonewall.
- 1.4 Product Handling** .1 Stack Fiber Cement Siding on edge or lay flat on a smooth, level surface. Protect edges and corners from chipping. Store sheets under cover and keep dry prior to installing.
- 1.5 Waste Management and Disposal Requirements** .1 Refer to *Section 01355 Waste Management & Control*.

PART 2 - PRODUCTS

- 2.1 Material** .1 Fibre Cement Siding and Trim:
.1 Manufacturer: James Hardie
.2 Products:
.1 HardiTrim Boards, Rustic Grain 12’, thickness 4/4”, 9.25” and 5.5” Widths
.3 Colours. See *Section 09999 Colour and Finish Schedule*.
.2 Air Barrier: as specified under Section 07260.
.3 Flashings: as specified under Section 07620.
.4 Fasteners: as per manufacturers recommendations.

PART 3 - EXECUTION

- 3.1 Workmanship** .1 All work shall be carried out by skilled tradesmen familiar with the application of all products.

- .2 Exterior siding shall be installed to form a continuous weatherproof protection system.
- .3 Where siding meets with roof, soffits, windows, doors, foundations, penetrations or other materials, all joints shall be properly sealed, caulked and/or flashed.
- .4 All work shall be left neat, free of defects, straight, level and plumb ready for final coat of stain.

3.2 Installation

- .1 Installation as per manufacturers' instructions:
 - .1 Starting: Install a minimum ¼ inch thick lath starter strip at the bottom course of the wall. Apply planks horizontally with minimum 1¼ inch wide laps at the top. The bottom edge of the first plank overlaps the starter strip.
 - .2 Allow minimum 1 inch vertical clearance between roofing and bottom edge of siding.
 - .3 Align vertical joints of the planks over framing members.
 - .4 Locate splices at least one stud cavity away from window and door openings.
 - .5 Use off-stud metal joiner when vertical joints occur between framing members.

END of SECTION

PART 1 - GENERAL

- 1.0 General** .1 The “General Conditions” and “Supplementary General Conditions” shall form part of this section.
- 1.1 Reference Standards** .1 C.S.S.B.I. Standard 20M-99 ‘Sheet Steel Cladding for Architectural and Industrial Applications’.
.2 All material to N.L.G.A. Standard Grading Rules for Canadian lumber.
- 1.2 Submittals** .1 Submit shop drawings in accordance with *Section 01330 Submittals*.
Indicate arrangement of metal cladding, including dimension, location of joints, profiles, types and locations of supports, fasteners, flashings, closures and all metal components related to the cladding installation.
- 1.3 Samples** .1 Submit 600 mm (24") lengths of all cladding material to Departmental Representative prior to fabrication.

PART 2 - PRODUCTS

- 2.1 Material** .1 Metal Cladding:
Prefinished Metal Cladding (see Wall Type - W1a):
.1 Fabricated from ASTM A653M structural quality Grade 230 galvanized steel, with Z275 zinc coating as designated by ASTM 653M for painted product.
.2 Acceptable product: Lam Mini Reveal (114mm) profile, 25mm reveal typical. 24 gauge.
.3 Finish: PVDF/Kynar 500 from CASCADIA METALS.
.4 Colours: Slate Grey – See *Section 09999 Colour and Finish Schedule*.
.2 Fasteners: Galvanized, with exposed fasteners colour matched to cladding.
.3 Flashings, Trim & Closures: Fabricate to profiles indicated on shop drawings, or as required to meet performance requirements. Use preformed corner pieces only, Double back exposed edges. Material to match cladding in exposed locations, galvanized material in concealed locations. See Section 07620 Metal Flashing & Trim.
.4 Supporting sub-girts/furring size, galvanized, profile, and spacing shall be as required to meet the standard performance of the metal cladding in project specific location.

PART 3 - EXECUTION

3.1 Workmanship

- .1 All work shall be carried out by skilled tradesmen familiar with the application of all products.
- .2 Exterior cladding shall be installed to form a continuous weatherproof protection system.
- .3 Where cladding meets with roof, soffits, windows, doors, foundations, penetrations or other materials, all joints shall be properly sealed, caulked and/or flashed.
- .4 Touch up minor paint abrasions with touch-up paint and clean cladding by dry wiping.

END OF SECTION

PART 1 – GENERAL

- 1.1 General** .1 The "General Conditions" and "Supplementary General Conditions" shall form part of this section.
- 1.2 Standards** .1 National Building Code of Canada, current edition.
.2 Perform all work in accordance with the RCABC "Roofing Practices Manual".

PART 2 – PRODUCTS

- 2.1 Products** .1 Prefinished Metal Flashings + Trim: 24 Ga. prefinished galvalume steel. All locations not referenced in 2.1.2.
.2 Prefinished Aluminum Flashings + Trim: 22 Ga. prefinished aluminum. All flashing located adjacent to aluminum.
.3 Fasteners: Concealed unless approved by Departmental Representative.
.4 Solder and Flux: type recommended for materials in use.
.5 Sealant: Dymeric by Tremco, PRC Rubber Caulk 5000. Colour to be approved by Departmental Representative.
.6 Colour to be approved by Departmental Representative. See *Section 09999 Colour and Finish Schedule*.

PART 3 – EXECUTION

- 3.1 Execution** .1 Fabricate flashings in maximum lengths on bending brake. Shape and trim in shop as far as practical. Hem all exposed edges. Allow for expansion/contraction.
.2 Construct flashing joints using flat 'S' lock seam, caulked. Fabricate corners minimum 18"x18" (450 mm x 450 mm), mitred and soldered, sealed as one piece.
.3 Form and install flashings square, true and accurate to size, free from distortion and other defects detrimental to appearance or performance.
.4 Backpaint flashings in contact with cementitious materials or dissimilar metals with bituminous paint.
.5 Paint the underside of all flashings to match flashing colour.
.6 Flash all locations where there is a horizontal joint in siding materials without any overlap.
.7 Do not join sections of flashing at less than 24" from the end of the run/length of flashing.
.8 Straighten, repair and clean all flashings at the end of the project.

END OF SECTION

PART 1 - GENERAL

- 1.1 General** .1 Provide roof drains (RD) and rain water leaders (RWL) to effectively drain all roof areas as shown on drawing and to meet all code requirements.

PART 2 - PRODUCTS

- 2.1 Products**
- .1 Roof drains: 24oz. Clamp-tite copper drain with aluminum clamping ring and die-cast aluminum strainer by Menzies or approved alternate.
 - .2 Downspouts: Hot-Dipped Galvanized steel pipes, diameter as indicated on drawings.
 - .3 Scuppers: As indicated on drawings.
 - .4 Gutters: 150x150 size, as located on drawings. Prefinished metal.

PART 3 - EXECUTION

- 3.1 Execution**
- .1 Carefully locate drains, scuppers and RWLs as shown in drawings. Confirm locations with consultant prior to beginning any installation work. Do not install elbows or horizontal runs on side of building without Departmental Representative's approval.
 - .2 Seal all gutter joints watertight.
 - .3 Install leaf guards to effectively keep debris out of downspouts.

END OF SECTION

PART 1 - GENERAL

- 1.1 General** .1 The "General Conditions" and "Supplementary General Conditions" shall form part of this section.
- 1.2 Description** .1 This section specifies firestopping materials and/or systems intended to act as a firestop and smoke seal within fire resistive wall and floor assemblies for any through penetrating items, poke through termination devices and electrical outlet boxes.
.2 Seals forming draft tight barriers to retard the passage of smoke, flame and hose stream.
.3 Firestopping for this project is a complete and integrated section of work. Include all firestopping requirements as specified herein, and required by code authorities to provide separations and barriers.
- 1.3 Standards** .1 National Building Code of Canada, current edition.
- 1.4 Submittals** .1 Submit samples, shop drawings and product data in accordance with *Section 01330 Submittals*.
.2 Submit duplicate samples showing actual firestop material.
.3 Submit shop drawings, product data and ULC Firestop Systems Design numbers for each installation condition to the Departmental Representative for review.
.4 Submit shop drawings to show proposed material, reinforcement, anchorage, fastenings, and method of installation. Construction details should accurately reflect actual job conditions.
.5 Submit shop drawings to show proposed smoke baffle.
.6 Submit the manufacturer's product data for materials and prefabricated devices, providing the descriptions are sufficient for identification at job site. Include the manufacturer's printed instructions for installation.

PART 2 - PRODUCTS

- 2.1 Materials** .1 Firestopping and Smoke Seal Systems: In accordance with CAN4-S115-M85.
.2 Service Penetration Assemblies: Certified by ULC in accordance with CAN4-S115-M85 and listed in ULC Guide No. 40 U19.
.3 Service Penetration Firestop Components: Certified by ULC in accordance with CAN4-S115-M85 and listed in ULC Guide No. 40 U19.13 and ULC Guide No. 40 U19.15 under the label Service of ULC.
.4 Fire-resistance rating of installed firestopping assembly not less than the fire-resistance rating of surrounding floor and wall assembly.

- .5 Firestopping and smoke seals at openings intended for ease of re-entry such as cables: elastomeric seals; do not use cementitious or rigid seal at such locations.
- .6 Primers: To the manufacturer's recommendation for specific material, substrate and end use.
- .7 Water (if applicable): Potable, clean and free from injurious amounts of deleterious substances.
- .8 Damming and Backup Materials, Supports and Anchoring Devices: To the manufacturer's recommendations, and in accordance with tested assembly being installed as acceptable to Authorities having Jurisdiction.
- .9 Sealants for Vertical Joints: Non-sagging.
- .10 Firestopping to openings in rated fire separation wall and to sizes and locations indicated to be Thermfibre (U.S. Gypsum Ltd.) as distributed by Tad Distributors or Firebarrier as distributed by Double A/D Distributors Ltd. or approved alternative and listed and labeled in accordance with the Underwriters Laboratories of Canada Guide No. 40 U18.7 File No. CR900. Density 64 kg per cubic metre.
- .11 Fire Stop Sealant: A single component silicone elastomer, Acceptable Product: Dow Corning Sealant 2000.
- .12 Self Leveling Fire Stop Sealant: A ready to use one part self-leveling silicone elastomer: Acceptable Product: Dow Corning Sealant 2003.
- .13 Cementitious Fire Stop: Non shrinking dry mortar mix (for addition of water) Acceptable Product: KBS Mortar Seal M550 as manufactured by IPC Canada (Distributor: Umacs of Canada Inc).
- .14 Smoke Baffle (if required as per drawings): 12mm tempered glass.

PART 3 - EXECUTION

3.1 Preparation

- .1 Examine sizes and conditions of voids to be filled to establish correct thicknesses and installation of materials. Ensure that substrates and surfaces are clean, dry and frost free.
- .2 Prepare surfaces in contact with firestopping materials and smoke seals to the manufacturer's instructions.
- .3 Mask where necessary to avoid spillage and overcoating onto adjoining surfaces; remove stains on adjacent surfaces.

3.2 Installation

- .1 Install firestopping and smoke seal material and components in accordance with ULC certification and the manufacturer's instructions.
- .2 Seal holes or voids made through penetrations, poke-through termination devices, and unpenetrated openings or joints to ensure continuity and integrity of fire separation are maintained.

- .3 Provide temporary forming as required and remove forming only after materials have gained sufficient strength and after initial curing.
 - .4 Tool or trowel exposed surfaces to a neat finish.
 - .5 Remove excess compound promptly as work progresses and upon completion.
- 3.3 Inspection**
- .1 Notify the Departmental Representative when ready for inspection and prior to concealing or enclosing firestopping materials and service penetration assemblies.
- 3.4 Schedule**
- .1 Firestop and smoke seal at:
 - .1 Penetrations through wall assemblies which act as a fire separation with at least a 45 min F.S/F.R.R.
 - .2 Top of fire-resistance rated gypsum board partitions.
 - .3 Intersection of fire-resistance rated gypsum board partitions.
 - .4 Control joints in resistance rated gypsum board partitions and walls.
 - .5 Penetrations through floor, ceilings and roofs assemblies which act as a fire separation with at least a 45 min F.S/F.R.R.
 - .6 Openings and sleeves installed for future use through fire separations.
 - .7 Around mechanical and electrical assemblies penetrating fire separations.
 - .8 Rigid Ducts: Greater than 129 cm² (20 square inches); firestopping to consist of bead of firestopping material between retaining angle and fire separation and between retaining angle and duct, on each side of fire separation.
- 3.5 Cleanup**
- .1 Remove excess materials and debris and clean adjacent surfaces immediately after application.
 - .2 Remove temporary dams after initial set of firestopping and smoke seal materials.

END of SECTION

PART 1 - GENERAL

- 1.1 General** .1 The "General Conditions" and "Supplementary General Conditions" shall form part of this section.
- 1.2 Standards** .1 National Building Code of Canada, current edition.
.2 CGSB Specifications

PART 2 - PRODUCTS

- 2.1 Materials** .1 Sealants:
 - .1 CGSB 19-GP-5M, one component, acrylic base, sealing compound.
Acceptable Product: Tremco Mono 555 sealant.
 - .2 CAN/CGSB-19.13, one component, elastomeric, chemical curing sealing compound.
Acceptable Product: Dow 795 Weatherproof Sealant.
 - .3 CAN/CGSB-19.17, one component, acrylic emulsion base sealing compound.
Acceptable Product: Tremco Tremflex 834 Sealant.
 - .4 CAN/CGSB-19.24, multi component, chemical-curing sealing compound
Acceptable Product: Tremco THC-900 Sealant.
 - .5 Single component synthetic sealing and bedding compound.
Acceptable Product: Tremco Acoustical Sealant.
 - .6 Single component Silicone w/ anti-fungal properties.
Acceptable Product: GE Sanitary 1700 Silicone.
- .2 Joint backing: closed cell round polyethylene.
- .3 Primers: as recommended by sealant manufacturer.
- .4 Colour from manufacturer's standard range to match adjacent surfaces. Submit colour to Departmental Representative for review.

PART 3 – EXECUTION

- 3.1 Location** .1 Apply CGSB 19-GP-5M sealant to the following exterior locations:
 - .1 Between window/door frames and adjacent building
 - .2 Around perimeter of exterior wall penetrations.
 - .3 At junction of dissimilar materials.
- .2 Apply CAN/CGSB-19.13 sealant to the following locations:
 - .1 Around window/door frames
 - .2 Around perimeter of exterior wall penetrations.
 - .3 At junction of dissimilar materials.
 - .4 Around fixtures, piping and conduits
 - .5 At concrete edges, joints and penetrations.
- .3 Apply CAN/CGSB-19.17 sealant to the following interior locations:
 - .1 Between window/door frames and adjacent building
 - .2 Around perimeter of exterior wall penetrations.

- .3 At junction of dissimilar materials.
- .4 Apply rubber acoustic sealant around perimeter of wall and at penetrations of concealed acoustic and vapour barrier applications.
- .5 Apply silicon sealant to floor and wall junctions of plumbing fixtures, to form a sanitary finished seal.

3.2 Application

- .1 Joints and spaces must be clean, dry, free from dust, paint, loose mortar and other foreign materials.
- .2 Clean ferrous metals of all rust, mill scale and or coatings by wire brush, grinding or sandblasting: remove oils and grease from ferrous and non-ferrous metals with xylol, tuluol or methylethyl ketone.
- .3 Joints and spaces to receive sealant: 6 mm (¼") deep minimum, 2 mm (3/32") wide minimum and 25 mm (1") wide maximum. Where these requirements are not met, obtain written permission from Departmental Representative before proceeding.
- .4 Fill joints where more than 12 mm (½") deep, to within 12 mm (½") of surface with a joint backing. Install backing under compression of not less than 25%.
- .5 Mask adjacent surfaces with tape prior to priming and caulking. Remove tape after joint has been tooled.
- .6 Apply sealant with a gun, with proper size nozzle, or knife as required.
- .7 Use sufficient pressure to fill all voids and joints solid, superficial pointing with a skin bead will not be accepted.
- .8 Surface of sealant shall form a full bead, smooth, free from ridges, wrinkles, sages, air pockets and embedded impurities.
- .9 Neatly tool surface to a slight concave.
- .10 Clean adjacent surfaces immediately and leave work neat and clean: Remove excess and droppings using recommended cleaners as work progresses.
- .11 Do not apply when temperature is below 5°C.
- .12 Colour to approximate adjacent surface.
- .13 Sealed joints to be water-tight.

END of SECTION

PART 1 - GENERAL

- 1.1 General**
- .1 The "General Conditions" and "Supplementary General Conditions" shall form part of this section.
 - .2 Provide a guarantee against warpage, twist, deformation, or other defects for a period of one (1) year after final acceptance. All defective frames shall be replaced and refinished at no cost to the Owner.
 - .3 Comply with all other instructions of frame manufacturer regarding care of frames to fulfill guarantee and fire rating requirements.
- 1.2 Reference Standards**
- .1 All approved pressed steel frame and door manufacturers must manufacture to recognized minimum requirements of the Canadian Hollow Metal Trade Association.
- 1.3 Submittals**
- .1 Provide shop drawings showing materials, manufacture details and installation details.
- 1.4 Delivery, Storage Handling**
- .1 Ordering: Comply with manufacturer's ordering instructions and lead- time requirements to avoid construction delays.
 - .2 Packing, Shipping, Handling, and Unloading: Deliver materials in manufacturer's original, unopened, undamaged containers with identification labels intact.
 - .3 Storage and Protection: Store materials protected from exposure to harmful weather conditions. Handle entrance doors and components to avoid damage. Protect entrance doors against damage from elements, construction activities, and other hazards before, during and after entrance installation.

PART 2 - PRODUCTS

- 2.1 Materials**
- .1 Hollow metal doors shall be flush type as manufactured by Shanahan's, Fleming, Baron, or pre-approved equivalent.
 - .1 44.5 mm thick. Sizes as indicated on the drawings issued in Addendum.
 - .2 Fabricated from 18 Ga. galvanized steel to produce full flush seamless construction.
 - .3 Doors to be reinforced, stiffened, sound deadened and insulated with rigid polyurethane foam, completely filling the inside of the door and laminated to both inside faces of the panels. Make provisions for cutouts for glass and/or louvers as noted on the plans.
 - .4 Edge seams welded, filled and ground smooth.
 - .5 Mortise and reinforce doors for hinges, locks and closers.
 - .6 Interior doors shall be Wipe Coat ZF75 Galvanizing.
 - .7 Exterior doors shall be hot dipped galvanized to Z275.

- .2 Exterior pressed steel frames shall be thermally-broken and to the specifications of Shanahan's Thermal Break Frame as indicated on the drawings. Interior pressed steel frames shall be to the specifications of Shanahan's MF 16ga. drywall frame with anchors suitable for installation in steel stud walls, as indicated on the drawings. Prepare doors and frames for hardware.
- .3 All fire-rated doors and frames shall carry the appropriate Underwriters' Laboratory of Canada label stating F.R.R. and heat rise limitations as required for each type of opening and protected during painting.
- .4 Interior frames shall be Wipe Coat ZF75 Galvanizing. Exterior frames shall be hot dipped galvanized to Z275.
- .5 Door frames shall be fabricated from 16 Ga. door buck stock free from scale or rust. Corners to be mitered, cut accurately, and continuously welded to form a one-piece, neat mitered corner assembly. Provide pressed steel glass stops. Each frame to be supplied with a minimum of three (3) anchors to each jamb to suit type of wall installation. Door frames shall have 8 Ga. plate steel hinge reinforcing. Strike reinforcing shall be 16 Ga.; reinforcing for surface closers shall be 12 Ga. steel. Adequately reinforced for other hardware as required. Provide floor plates at each jamb for fixing to floor.
- .6 All steel door frames shall be provided with factory installed rubber bumpers, (3) per strike joint and (2) per head for pair of doors.
- .7 Provide temporary spreaders to ensure alignment of fixed frames. Remove when fixed in place.
- .8 Where shown on the drawings door frames to be prepared for future installation of electric door strikes. Provide mortise cut-outs for electric strikes and conduiting for future installation of security hardware.
- .9 Finish: see *Section 09999 Colour and Finish Schedule*.

PART 3 - EXECUTION

3.1 Execution

- .1 Frames shall be installed plumb, free of twist and the jambs shall not be bowed.
- .2 All work to be properly erected or hung in correct locations; perfectly plumb, level and true and free from excessive stress, distortion and defects of workmanship or materials, by fully experienced and well-equipped tradesmen.
- .3 Frames shall be securely fixed with anchors provided.
- .4 Doors shall be properly hung on scheduled hardware; test ease and adjust to operate easily and quietly; leave in first class working order; doors to exterior to be wind and weather-tight.
- .5 Temporary Locking: by screwdriver operated plastic plugs in locks, or temporary cylinders and keys for security of area, on completion installed permanent cylinders supplied.

- .6 Provide temporary protection of this work, as necessary to prevent damage by all trades.
- .7 Clean off any dirt, grease, etc., make good defects; touch-up with the specified primer, any scratches, etc. and leave all work in perfect working order and ready for painting.

END of SECTION

PART 1 - GENERAL

- 1.1 General** .1 The "General Conditions" and "Supplementary General Conditions" shall form part of this section.
- 1.2 References** .1 Architectural Woodwork Manufacturers Association of Canada Standards (AWMAC) for Wood Doors.
.2 Institutional Grade.
.3 Fire Rated Doors to conform to CAN4-S112M and installed according to N.F.P.A. 80.
.4 Door edge detail to AWMAC Standard #4.
.5 National Building Code of Canada, current edition.
- 1.3 Submittals** .1 Submit shop drawings in accordance with *Section 01330 Submittals*.
- 1.4 Delivery, Storage Handling** .1 Ordering: Comply with manufacturer's ordering instructions and lead- time requirements to avoid construction delays.
.2 Packing, Shipping, Handling, and Unloading: Deliver materials in manufacturer's original, unopened, undamaged containers with identification labels intact.
.3 Storage and Protection: Store materials protected from exposure to harmful weather conditions. Handle entrance doors and components to avoid damage. Protect entrance doors against damage from elements, construction activities, and other hazards before, during and after entrance installation.
.4 Store doors in interior environment of 16°C minimum. Doors shall not exceed 12% moisture content while stored.
.5 Comply with all other instructions of door manufacturer regarding care of doors to fulfill guarantee requirements
.6 Maximum permissible warp of 1.5 mm measured diagonally across door. Doors with warp exceeding this will be rejected.
- 1.5 Guarantee** .1 Provide a written guarantee against warpage, twist, telegraphing of joints, splitting delamination, sag, deformation, or other defect, for a period of two (2) years after final acceptance. All defective doors shall be replaced and refinished at no cost to the owner.

PART 2 - PRODUCTS

- 2.1 Materials** .1 Interior Doors:
.1 Flush Interior Doors, Institutional Grade, 44mm thick Medium Duty Stave Core Hardwood / Hardboard door to AWMAC specifications.
.2 Faces: Paint Grade
.3 Core construction: Solid core top and bottom rails.
.4 Single pane, tempered glass as shown on drawings or door schedules. See *Section 08800 Glazing*.

- .2 Flush Wood Fire Rated Doors:
 - .1 Flush wood fire doors shall be ULI, ULC, or WHI tested and labeled fire doors for fire ratings as scheduled.
 - .2 Flush wood fire rated doors shall have a reinforced door edge and a blocking system for hardware. Location of lock, closures and panic hardware blocks shall be as indicated on shop drawings.
 - .3 Faces: Paint Grade
 - .4 Edges shall be to the manufacturer's standard for fire rated wood doors.

PART 3 - EXECUTION

3.1 Glazing/cutouts

- .1 Make cut-outs in doors for grilles and glass and provide necessary stops. No cut-outs permitted within 150mm (6") of sides and top of door or 200mm (8") from bottom of door. Lip stops unless otherwise detailed.
- .2 Stops and louvers: Solid material to match doors, mitered corners.
- .3 See Architectural and Heating and Ventilation Drawings for location and sizes of door grilles and glazing.

3.2 Panels

- .1 Match to adjacent doors with same materials and construction.

3.3 Installation

- .1 Fit, hang and trim as required, with 2mm clearance on sides, 5mm clearance on top and over thresholds, and 10mm at bottom of door unless otherwise indicated. Bevel lock edge 3mm.
Fire Rated doors: fit, hang and trim as required.
- .2 All hardware shall be mounted in accordance with manufacturers' recommended instructions utilizing the templates provided.
- .3 Doors requiring stain, oil, or paint shall be seal coated on arrival on site.
- .4 Install glazing with stops provided.
- .5 Install door grilles supplied by the mechanical contractor.
- .6 Test and adjust operable parts for correct function. Doors to operate without binding.

3.4 Finish

- .1 Wood doors as scheduled, to receive a paint finish. Refer to *Painting Section 09900 Painting* and *Section 09999 Colour and Finish Schedule*.

END of SECTION

PART 1 - GENERAL

- 1.1. General** .1 Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specifications Sections, apply to this section.
- 1.2 Standards** .1 National Building Code of Canada, current edition.
.2 CAN/CSA-A-440-00
- 1.3 Submittals** .1 Submit Shop Drawings in accordance with *Section 01330 Submittals*.
.2 Shop Drawings: For each product specified, including details of construction relative to materials, dimensions of individual components, profiles, elevations of unit, anchorage details, location of isolation coating, description of related components including air and water barrier, and exposed finishes and fastener, sealant material, glazing methods; type of construction including joinery, fabrication and erection tolerance.
.3 Quality Assurance: include certification from established independent testing agency that windows will meet required CAN/CSA-A440 classification ratings.
- 1.4 Maintenance Data** .1 Provide maintenance data for cleaning and maintenance of aluminum windows for incorporation into maintenance manual described in *Section 01330 Submittals* and *Section 01830 Operations and Maintenance*.
- 1.5 Warranty** .1 Provide manufacturers warranty in writing aluminum window against leakage, defects, and malfunction under normal usage for a period of (1) one year from date of Substantial Performance of Work.
.2 Refer to *Section 08800 Glazing* for insulating glass units warranty.

PART 2 - PRODUCTS

- 2.1 Materials** .1 Vinyl windows shall be based on thermally broken:
- Starline Eclipse 6000 Series (Windows)**
Starline 8500 Series (Sliding Door)
- Performance Requirements:
- .1 Air Tightness: A3
.2 Water Tightness: B3
.3 Wind Load Resistance: C3
- .2 Screws, nuts, bolts, washers, etc. - stainless steel or plated with material not harmful to vinyl.
- .3 Glazing bead - Snap-in aluminum extruded type.
- .4 Sealant - Tremco or approved alternate:

- .1 General: Monolastomeric
- .2 Couplings: Small joint sealer clear
- .3 Heel Bead: Monolastomeric
- .5 Insect screens to CGSB 79-SP-1M Type 1, Style 1, Class 18 x 14 mesh to be supplied for all openings. Insect screen with CAN/CSA-A440 classification rating.

2.2 Vinyl Windows/ Sliding Doors

- .1 Window and sash frames - mitred and mechanically jointed at corners, resin thermal break.
- .2 Windows to withstand a wind load of 20 lbs. per sq. ft. without deflection sufficient to break glazing seal.
- .3 Glazing: interior windows to be single glazed, exterior windows to be double glazed sealed units. Refer to *Section 08800 Glazing*.
- .4 Open Vents:
 - .1 awning and casement types
 - .2 extruded aluminum dripcaps as required
 - .3 hinges to be cadmium plated steel adjustable friction hinges.
 - .4 vents to have heavy duty rotary crank handle opener
 - .5 insect screens.
 - .7 thermally broken operable awnings and casements.
- .5 Windows shall be shop assembled complete with hardware and glazing prior to delivery.
- .6 Weatherstrip:
 - .1 Double P.V.C. extrusion fitted integrally to fixed and moving frame to provide continuous pliable contact around ventilator perimeter in addition to two-point metal to metal contact.

2.3 Air Infiltration

- .1 Vents to fit tightly to frame on entire perimeter.
- .2 Air infiltration measured in cu. ft. per minute per ft. of crack length when window subject to static air pressure equal to pressure exerted by wind at velocity of 25 mph.

2.4 Hardware

- .1 Hardware to be stainless steel, finish matching with window. Fastening screws secured with matching colour stainless steel countersunk nuts.

2.5 Finish

- .1 Finish as per Dwg. A901 and *Section 09999 Colour and Finish Schedule*.

PART 3 EXECUTION

3.1 Installation

- .1 Erect in prepared openings by experienced workmen.
- .2 Set plumb and true, properly aligned and securely anchored.
- .3 Correctly adjust ventilators before glazing.

- .4 Caulk joints at mullions, between connecting windows, contacts with windows and sills. Caulk perimeter. Conceal sealant within aluminum work.
- .5 Seal joints between frame members and other non-operating components with sealant to provide watertight seal at outside and air/vapour seal at inside.

3.2 Anchors

- .1 Standard anchors, clips or lugs as required.
- .2 Galvanized steel or aluminum.

3.3 Glazing

- .1 Apply 3 mm x 10 mm butyl tape to glazing legs of frame and lap glass upon tape. Maintain min. clearance of 3 mm at edges of glass.
- .2 Apply setting blocks under lower edge of glass.
- .3 Install heel bead at glass perimeter.
- .4 Snap glazing bead in place and roll in vinyl between head and glass.

END of SECTION

PART 1 - GENERAL

1.1 General

- .1 The "General Conditions" and "Supplementary General Conditions" shall form part of this section.
- .2 Furnish all labour and materials for the supply only of all mechanical finish hardware.
- .3 Furnish all labour and materials for the supply and installation of all electrified hardware and automatic operators.
- .4 All wiring for the system shall be supplied, installed, terminated, and labeled by this section. All specified electrified devices shall be made fully operational by this section.

1.2 Quality Assurance

- .1 Hardware shall be installed by qualified trades people, regularly engaged in the installation of electrified security hardware. Installers shall have a minimum of five (5) years documented experience in the installation of hardware of the type required for the work. Installers shall have worked on at least two (2) projects of similar character and magnitude as required for the specified work. If requested, provide a written statement within (30) thirty days of Contract award outlining installer's experience, projects, and contact references. Any changes to the approved installation crews shall require written approval of the Departmental Representative.
- .2 Meet all requirements of the National Building Code, current edition, and all other applicable regulations.
- .3 Products listed in Part 2 of this specification establish the minimum requirements for this project. Deviation from specified products will require the supply and installation of correct products.
- .4 Qualified suppliers must have in their employ a Certified A.H.C. (Architectural Hardware Consultant) as licensed by the Door and Hardware Institute. The supplier must have a minimum of two (2) years experience furnishing hardware for similar projects. Only firms that can extend manufacturers warranty to the project are to be considered as suppliers.
- .5 Only heavy duty or "Institutional Type/Grade" hardware is acceptable on this project.

1.3 Approvals

- .1 Applications for approvals to be made in writing clearly requesting equivalents and proving necessary relevant information.
- .2 Only approvals issued by addenda will be acceptable.
- .3 All substituted items or not approved items will be replaced with specified items and all related costs will be borne by the Contractor.
- .4 Refer to *Section 01600 Materials and Equipment* for procedures and submission requirements for substitutions.

- 1.4 Submittals**
- .1 Submit shop drawings in accordance with *Section 01330 Submittals*.
 - .2 Upon request of the Departmental Representative and/or Owner, provide mounted samples of hardware items to be supplied.
 - .3 Prepare and submit three (3) copies of a detailed hardware schedule listing product numbers, size and finishes. Include two (2) sets of catalog cuts.
 - .4 Furnish other sections with two (2) complete sets of hardware templates for related fabricating and installation.
 - .5 Where electrical hardware is to be supplied, provide wiring diagrams showing all wire termination points. Where electrical hardware is to be supplied and installed provide the contractor with riser diagrams listing the correct wire runs and back box sizes as well as 115 VAC requirements.
 - .6 Provide two (2) operating manuals for the Owners use as per Section 01830. Include copies of the hardware schedule, templates, installation instructions and all maintenance data.
 - .7 Submit six (6) copies of shop drawings including: system block diagrams indicating all components, interconnection and cabling; complete detailed system point to point circuit and riser diagrams, conduit and cable allocations, enclosure and back box types; and all required information to provide a detailed review of functional criteria and equipment assessment. Provide conduit drawings specific to each door application for coordination with Division 16.
 - .8 Provide (2) two sets of maintenance manuals. Include copies of the as installed hardware schedule, templates, installation instructions, maintenance data, and as installed wiring diagrams including installed wire color codes.
- 1.5 Product Delivery, Handling and Storage**
- .1 Deliver each hardware item in its original package complete with all fasteners, keys, templates, and installation instructions required for installation.
 - .2 Clearly mark each container with the door opening number and the hardware schedule item or heading number.
 - .3 The contractor must store hardware delivered in a secure area. The storage area must contain adequate shelf space to hold all the hardware off the floor. Ensure the area is kept dry and clean.
 - .4 When requested, package items of hardware separately for delivery to other fabricators for the installation.
- 1.6 Coordination**
- .1 All electrified hardware applications and products have been Specified to allow for all available options and the exact operation is deemed to be a site configurable variable. It will be the responsibility of the Contractor to determine the exact

- functionality and operational requirement for all electrified hardware as well as the exact requirements for interface to related systems prior to commencing work.
- .2 Coordinate final conduit system design, device locations and electrical service allocations and requirements with all affected trades. Division 16 contractors shall be responsible for the supply and installation of all conduit, standard back boxes, junction boxes, device boxes, and terminal panels to provide a complete conduit system. Provide all power supplies and application specific enclosures to Division 16 Contractor for installation as part of the conduit system. Substantial corrosion resistant pull strings to be installed in all conduit runs.
 - .3 Coordinate hardware components with door and frame manufacturers to ensure correct door and frame preparation. Inform manufacturers where conduit may be required within their respective assemblies and provide all required templates for door and frame preparation. Ensure that frames have been prepared correctly and that appropriate back boxes for conduit termination have been provided at correct locations prior to frame installation. Ensure that doors have been prepared correctly for all devices and that doors contain flexible conduit where required.
 - .4 Coordinate with aluminum door trade to ensure the proper preparation and fabrication of aluminum doors and frames including storefront and curtain wall. Coordinate frame preparation during fabrication where the installation of wiring or conduit within frame assemblies may be required for electrified hardware. Provide physical samples rather than paper templates if requested. If any devices are required to be installed in door or frame assemblies in the shop or during assembly or fabrication, provide such items direct to manufacturers in ample time to allow for work to be completed in accordance with construction schedule.

PART - 2 PRODUCTS

2.1 Materials

- .1 Supply material as specified on hardware list and as approved by the Departmental Representative.
- .2 Shall be Grade 1, perfect fit, uniform in colour, free from defects. Use BHMA 626 finish throughout project.
- .3 Hardware installed in rated closures shall be U.L.C. approved.
- .4 Catalogue numbers and trade names listed herein are given as a means of describing the standard of acceptance - type, materials strength, design, quality, weight, mechanical construction, operation of items and requirements to which such hardware shall conform.
- .5 Hardware:
 - .1 Butt hinges:
 - .1 Exterior doors shall be stainless steel: Hager BB1191NRP 4½" x 4". Acceptable products:

- Stanley FBB191, McKinney TA2314 NRP, Dorma BB NRP.
- .2 Interior doors: shall be Hager BB1279 4½" x 4".
Acceptable products: Stanley FBB179, McKinney TA2714, Dorma BB.
 - .3 Closers: shall be Grade 1 in 626 finish, LCN "Smoothee" 4110N CUSH. Acceptable alternate: Stanley D-4551-S, Sargent 351-P9, Dorma 8900 Series.
 - .6 Mortise Lock Sets: shall be Grade 1 Mortise Lock Sets ANSI Function F20 in 626 finish, shall be Schlage L series LV Vandgard with L06 lever, N Escutcheon and EZ Turn thumbturn.
Acceptable products:
Stanley 40H series 47H high security with L15 lever, M Escutcheon, or Sargent 9200 high security with L lever, LS Escutcheon, or Sargent 8200 w/ trim ETL.
 - .7 Interior Lock Sets: shall be Schlage "D" Series w/ Rhodes Leveler – Finish to be determined by Departmental Representative. Acceptable alternate: Stanley 9K Series with 14C Lever and Trim, Dorma CL800 Series, Sargent 10Line, Stanley 93K Series & Schlage ND Series.
 - .8 Interior Privacy Sets: shall be Weiser Welcome Home Series - Dane lever Grade 2. Acceptable alternate: Stanley 7KC Series, 15D Lever, Sargent 7 Line L Lever, Dorma CL700 Series.
 - .9 Interior Passage Sets: shall be Weiser Welcome Home Series - Dane lever Grade 2. Acceptable alternate: Stanley 7KC Series, 15D Lever, Sargent 7 Line L Lever, Dorma D800 Series.
 - .11 Stops: shall be Hagar 241F or 243F.
 - .12 Threshold: shall be Pemko 200-5AV and to be supplied 25 mm (1") longer than door or opening width.
 - .13 Weatherstripping: shall be Pemko 316_S.
- 2.2 Fastening**
- .1 Supply screws, bolts, expansion shields and other fastening devices required for satisfactory installation of hardware.
- 2.3 Keying**
- .1 For the purpose of tendering:
 - .1 Locksets to be Grand Master Keyed.
 - .2 Final keying including establishing Master Key Groups will be as per Owners instructions.
 - .3 Successful supplier must be prepared to co-operate with the Owner re: final keying.
 - .4 Provide two (2) keys per lock - keyed differently.
 - .5 Provide one (1) key per lock - keyed alike.
 - .6 Keys to be stamped "Do Not Duplicate".
 - .7 Locksets to be construction master keyed.

- .2 Master and Grand Master Keys to be delivered directly to the Owners.

PART 3 - EXECUTION

3.1. Inspection

- .1 The hardware supplier must inspect all the door openings to ensure that installation is complete and that all items are operating as intended. When requested, provide a written report on all site inspections made.
- .2 Inspect surfaces and conditions on site prior to commencing work. Verify that all door and frame assemblies have been prepared correctly prior to commencing work. Commencement of work assumes acceptance of site conditions.
- .3 Verify that all conduit, back boxes, junction boxes, device boxes, and terminal panels have been installed where required prior to commencing work.
- .4 Prior to final inspection verify that all hardware has been installed according to the approved hardware schedule and manufacturers instructions, and ensure correct operation.

3.2. Installation

- .1 The general contractor shall obtain a copy of ANSI/DHI A115.1G-94, "Installation Guide for Doors and Hardware". It is the intent of this document to be used as a reference guide in the proper handling, storage, and installation of finishing hardware, and doors and frames. This document can be obtained through the Door and Hardware Institute.
- .2 Other trades installing hardware must follow all manufacturers instructions including door closer adjustment, handing of locksets as required, and degree of door swing. Advise the Departmental Representatives if doorframes are not square and plumb and prevent proper door installation.
- .3 Mount hardware to suit door elevations. Unless otherwise directed by the Departmental Representative, install hardware at the following mounting heights:

Locksets	1015mm	(40")
Exit device	1015mm	(40")
Push/Pull	1065mm	(42")
Deadlock	1200mm	(47 1/4")
- .4 When requested, the hardware supplier will instruct the installer as to how various newer or unusual items that are required to be installed for proper performance.
- .5 Install controller electronics and electrified hardware in accordance with approved shop drawings and manufacturers installation instructions.
- .6 Install and terminate all wiring from hardware controllers to the door devices. Refer to Division 8 hardware devices and Division 16 hardware devices shall take place at the master terminal strip at each door location or at centralized power supplies if specified.

- .7 All wiring shall be neatly installed and terminated on terminal strips provided. All terminal blocks and wiring shall be tagged and labeled.
- .8 Weatherstripping is not to be installed until final coat of paint has been applied to the door and frame and is completely dry.

3.3. Testing and Commissioning

- .1 Prior to final inspection verify that all hardware has been installed according to the approved hardware schedule and Manufacturer's instructions. Test all electrical hardware and monitoring devices to ensure that hardware is fully operational in stand-alone mode.
- .2 Provide point-by-point verification list to Division 16 Security Contractor that all devices are installed, connected, tested and are ready for interfacing to the access control system.
- .3 Commissioning shall be performed for both stand alone and integrated operations. Access and egress control functions of the electrified hardware shall be demonstrated in stand-alone mode without the interface to the access control system. Door position monitoring and request to exit functions shall be demonstrated by a circuit continuity test from the device to the interface terminal strip. Coordinate commissioning of integrated operations with Division 16 Security Contractor to complete the door and security requirements to a fully operational state including; control, monitoring, alarm and reset functions, as well as free or delayed egress exit related functions.

END of SECTION

PART 1 - GENERAL

- 1.1. General** .1 The "General Conditions" and "Supplementary General Conditions" shall form part of this section.
- 1.2. References** .1 National Building Code of Canada, current edition.
.2 Window products to comply with NAFS-08 and Canadian Supplement (A440S1-09). Commercial storefront, entrance doors, and any windows that are site glazed are exempt from NAFS certification.
.3 CSA. standard A440-00.
- 1.3 Warranty** .1 Provide a written guarantee, signed and issued in the name of the Owner, stating that the hermetically sealed glass units described in this Section are guaranteed against interpane dusting or misting for a period of (10) years from the date of Substantial Performance and that any defective units will be replaced, including making good of adjacent glazing frame, without cost to the Owner, during the (1) one year Building Guarantee Period. After that period, replacement units will be supplied to the Owner for installation by him.
- 1.4 Submittals** .1 Submit shop drawings in accordance with *Section 01330 Submittals*.
.2 Product Data: For each product specified, include details of construction relative to materials, dimensions of individual components, profiles, and finishes.
.3 Shop Drawings: Show details of fabrication and installation, including plans, elevations, sections, details of components, provisions for expansion and contraction, glazing details, and attachments to other work.
.4 Samples: Provide samples of each type of product section and exposed finish required in manufacturer's standard sizes.
.5 Glazing Engineer's Signed and Sealed Schedules.

PART 2 - PRODUCTS

- 2.1 Materials** .1 Exterior Windows/Doors: All exterior windows/doors to be tempered glass, double-glazed sealed units in Pre-Manufactured Windows. It is the responsibility of the glazing contractor's specialty engineer to meet the wind load requirements.
.1 Outer lite minimum 6 mm thick or as per minimum wind load requirement, clear, fully tempered glass unless noted on the drawings. Low-E2 soft coating on No.2 surface "Solarban 60 by PPG" or approved equal.
.2 Inner lite minimum 5 mm thick or as per minimum wind load requirement, clear, fully annealed glass for punched windows and exterior glazed doors.
.3 Air space to be 12 mm.

- .4 Spacer Bar. Warm Edge Technology or black triseal.
- .5 Performance of the sealed units shall meet or exceed:
 - a. U Value 0.19 imperial.
 - b. Visible Light Transmittance: 65%.
 - c. Visible Reflectance: IN 10%: Out 11%.
 - d. Solar Heat Gain Coefficient: 0.36.
- .2 Mirrors: as per drawings and *Section 10800 Washroom Accessories*.
- .3 Joint Fillers and Setting Blocks:
 - .1 General: Compatible with primers and sealants, out sized 30% to 50%.
 - .2 Neoprene or Vinyl: Extruded closed cell foam, shore A hardness 70 - 90, tensile strength 20 - 30 psi.
- .4 Glazing Compounds: Oil type to CGSB 19-GP-6 gun grease. Sealant: Silicone base, one component, to CGSB 19-GP-9 of colour to match framing. Dow-Corning 781 or approved equal.
- .5 Glazing Tape: of pre-formed butyl tape, 10-15 durometer hardness, paper release, 3 mm thick x width of glazing stop. Tremco #440 or approved alternate. Colour to match framing.
- .6 Do not use printed paper signs on installed glass.

PART 3 - EXECUTION

3.1 Glazing

- .1 All glass shall be new material, the best of its kind, and shall be free from cracks, flaws, or other defects. Each individual piece of glass shall bear a label by the manufacturer, giving the manufacturer's name and trademark, the quality of glass, thickness designation, direction of draw, if required, and country of manufacture. All labels shall be left on the glass until removal is authorized by the Departmental Representative.
- .2 All glazing shall be installed in accordance with the standards of the Flat Glass Jobbers Association Glazing Manual.
- .3 No glazing shall be performed in temperatures below 4.5°C, nor before all surfaces, where required, are back-painted.

3.2 Protection

- .1 Mark installed glass with whiting or labels and take necessary precautions to protect installed work against damage.
- .2 Remove and replace damaged, scratched or cracked glass prior to acceptance of building.

3.3 Cleanup

- .1 On substantial completion, clean up whiting, labels, excess glazing compound finger marks, etc., and leave glass clean.
- .2 Remove all excess material and debris from site.

END OF SECTION

PART 1 - GENERAL

- 1.1 General** .1 The "General Conditions" and "Supplementary General Conditions" shall form part of this section.
- 1.2 Reference Standards** .1 National Building Code of Canada, current edition.
.2 CSA. A82.31-M1980.
.3 CSA. A82.27-M1991.
.4 AWCC Specifications Standards Manual-2012.
- 1.3 Product Delivery & Storage** .1 All materials shall be delivered to the site in their original containers and packaging with all labels intact and legible at their time of use.
.2 All materials shall be stored in off-ground areas close by where they are to be installed.
.3 Ensure temperature of interior areas are within the recommended range of 12°C to 21°C, 24 hours prior and during entire installation.
.4 Ensure proper ventilation to eliminate excess moisture.
.5 All damaged goods shall be removed from the site and replaced with new material.

PART 2 - PRODUCTS

- 2.1 Materials** .1 Gypsum Wallboard ULC Rated
.1 Fire rated 16 mm (5/8") ProRoc, or approved equivalent, Type X, shall be to CSA. A82.27.
- .2 Gypsum Wallboard:
.1 16 mm (5/8") ProRoc, or approved equivalent wallboard to CSA. A82.27
- .3 Moisture Resistant Gypsum Wallboard:
.1 16 mm (5/8") ProRoc M2 Tech, or approved equivalent wallboard to CSA. A82.27.
- .4 Joint filler and cement shall be as manufactured by Synkoloid, Westroc or approved alternative. Shall be asbestos-free.
- .5 Drywall adhesive to be waterproof organic type, gun applied to studs for wall application.
- .6 Drywall corner bead and casing bead, one-piece length per location shall be Pedlar Nos. 4408 and 4411, or equal. To suit wallboard thickness.
- .7 Screws: Drywall screws, self-tapping, self-drilling, length:
.1 30 mm (1¼") for 12 mm (½") board
.2 40 mm (1-5/8") for 16 mm (5/8") board
- .8 Nails:
.1 rust-proof annular grooved steel
.2 6 mm (¼") flat head
.3 48 mm (1-7/8") long for 16 mm (5/8") board
- .9 Drywall furring screw channel: 12 mm (½").
- .10 Corner: Galvanized Metal.
- .11 Fill type galvanized metal to ASRM C1047.

PART 3 - EXECUTION

- 3.1 Inspection of Surfaces**
- .1 Prior to the installation, all areas to receive the work of this Section shall be inspected to confirm they are ready to receive the gypsum wallboard coverings.
 - .2 All deficiencies in the work found by this inspection both in the building construction requirements and the conditions which will affect the work of this Section shall be corrected prior to the commencement of the work of this Section.
 - .3 Commencement of work by the Contractor shall imply his acceptance of all construction and surfaces. Defects found in the work of this Section shall be the responsibility of the Contractor.
- 3.2 Installation**
- .1 All work to be done to AWCC Standards, by experienced tradesmen.
 - .2 All interior boards shall be 1220mm width by length of installation up to 3600mm. All boards to be installed vertically, one board per total height requirements unless otherwise noted.
 - .3 Single layer application:
 - .1 horizontal method - boards at right angles to bearing.
 - .2 screw fixing to be at 150 mm (6") o.c. for ceilings
 - .3 fixing to be at 400 mm (16") o.c. for walls
 - .4 adhesive to be applied on all studs
 - .3 Corner and casing beads as detailed and to BCWC Standards. All beads and corners to be screwed on.
 - .5 Provide corner beads at all outside corners, and casing bead (J mold) to all free edges of gypsum board, where drywall abuts against a surface having no trim concealing its juncture, and where shown on the drawings.
 - .6 Allow for GWB. returns at all window heads and jambs. Refer to Architectural Drawings.
- 3.2 Finish**
- .1 Apply tape and joint filler and taping cement in accordance with Domtar "Drywall Finishing" directives.
 - .2 Taping and filling may be done either manually or by mechanical means.
 - .3 The finished work shall be smooth, seamless, plumb, true and flush with square neat corners.
- 3.3 Cleanup**
- .1 Remove all waste, debris, and excess materials as work proceeds.

END of SECTION

PART 1 - GENERAL

- 1.1 General** .1 The "General Conditions" and "Supplementary General Conditions" shall form part of this section.
- 1.2 References** .1 National Building Code of Canada, current edition
.2 CSA Standards A126.3-M1984
.3 B.C. Floor Covering Association.
.4 Sheet material meets ASTM F 1913 performance standards for homogeneous single layered vinyl floor covering
- 1.3 Submittals** .1 Product Data: Submit manufacturer's current printed product literature, specifications, installation instructions, and field reports in accordance with *Section 01330 Submittals*.
.2 Shop Drawings: Submit shop drawings to indicate materials, details, and accessories in accordance with *Section 01330 Submittals* including but limited to the following:
.1 Submit a cut diagram indicating seam locations and roll direction. Use mitered seam layouts for corners when changing directions 180 degrees (e.g. when running material down corridors which bisect at a right angle), unless approved otherwise.
.3 Samples: Submit duplicate 300 mm x 300 mm (12" x 12") sample pieces of sheet material, 300 mm (12") long in accordance with *Section 01330 Submittals*.
.4 Quality Assurance Submittals: Submit the following:
.1 Test Reports: Submit certified test reports in accordance with *Section 01330 Submittals*. Submit test reports from approved independent testing laboratories showing compliance with specified performance characteristics and physical properties.
.2 Manufacturer's Instructions: Current published manufacturer's installation and maintenance instructions.
.5 Closeout Submittals: Submit the following:
.1 Operation and Maintenance Data: Submit manufacturer's operation and maintenance data for incorporation into manual specified in accordance with *Section 01780 Closeout Procedures*. Include methods for maintaining installed products and precautions against cleaning materials and methods detrimental to finishes and performance.
.2 Warranty: The Contractor shall guarantee his work as to labour, materials, and workmanship for a period of one (1) year after the date of the Consultant's Certificate of Substantial Completion.
- 1.4 Quality Assurance** .1 Installer Qualifications: Experienced in performing work of this section and who is specialized in the installation of work similar to that required for this project.

**1.5 Delivery, Storage
Handling**

- .1 Ordering: Comply with manufacturer's ordering instructions and lead-time requirements to avoid construction delays.
- .2 Deliver, store and handle resilient flooring materials in accordance with *Section 01600 Materials and Equipment*.
- .3 Deliver materials in manufacturer's original, unopened, undamaged containers with identification labels intact.
- .4 Store materials protected from exposure to harmful weather conditions, at temperature and humidity conditions recommended by manufacturer.
- .5 Store rolls in dry locations. Stand rolls on end. Protect and secure rolls from falling.

1.6 Extra Material

- .1 Provide the Owner with a minimum of 2% of each flooring type, 50' of rubber base, and minimum one-year's supply of sealers and wax required for maintenance for each colour and pattern of flooring material used.

PART 2 - PRODUCTS

2.1 Materials

- .1 Resilient Flooring to meet abrasion resistance = EN 660-2, Group T:
 - .1 Acceptable Product: IQ Optima Tarkett Collection by Johnsonite. Acceptable Alternates: Pearlazzo PUR by Polyfloor, Mipolam Symbioz by Gerflor.
- .2 Primers and Adhesives: Waterproof, non-solvent based, of types recommended by resilient flooring manufacturer for specific material on applicable sub-strata.
Sealer and Wax: Type recommended by resilient flooring material manufacturer for material type and location.
- .3 Colour selection as per Departmental Representative's approval. Selection to be from manufacturers complete standard range.
- .4 Refer to *Section 01600 Materials and Equipment* for procedures and submission requirements for substitutions. See Drawings for location.

PART 3 - EXECUTION

3.1 Sub-Floor

- .1 Inspect sub-floor and ensure floor surfaces are smooth and flat to plus or minus 5 mm over 3000 mm (1/5" over 10') before applying sheet floors.
- .2 Report defects to Departmental Representative in writing. Commencement of work indicates acceptance of sub-floor.
- .3 Ensure concrete floors are dry, maximum 7% moisture content and exhibit negative alkalinity, carbonization or dusting. Cured concrete to be at least 28 days old.
- .4 Fill low spots, cracks, joints, holes and other defects with sub-floor filler suitable for concrete.

- .5 Prime sub-floors to receive resilient flooring as recommended by manufacturer.
- 3.2 Installation**
 - .1 Install flooring in accordance with the current manufacturers published installation guide.
 - .2 Areas to receive flooring shall be clean, fully enclosed, weathertight, and maintained at a uniform temperature.
 - .3 Subfloors shall be prepared in strict accordance to flooring manufacturer's recommended procedure.
 - .4 Install materials in strict accordance to flooring manufacturer's recommended procedure.
 - .5 Install flooring with maximum sheet widths and with sheet parallel to length of room.
 - .6 Make joints and terminate resilient flooring at centreline of door, in door openings.
 - .7 Scribe flooring to walls, columns, cabinets, floor outlets, and other appurtenances to produce tight joints.
 - .8 Roll the floor covering with a roller to break down adhesive ridges and expel any entrapped air while adhesive is still wet.
 - .9 Install with joints tight, flush and true.
 - .10 For best color match on installation requiring more than one (1) roll, be sure rolls used in same area are the same lot number.
 - .11 Avoid working on newly installed flooring whenever possible.
- 3.3 Installation Base**
 - .1 Install Rubber base with a minimum of joints, tight to wall and floor, and scribed at corners.
- 3.4 Protection**
 - .1 Cover and protect finished installation from damage from other trades using a non-staining, temporary floor protection system, such as a reusable textured plastic sheeting.
 - .2 Protect the newly installed flooring from foot traffic for 48 hours.
 - .3 Protect installed product and finish surfaces from damage during construction.
- 3.5 Cleaning**
 - .1 Remove temporary coverings and protection of adjacent work areas.
 - .1 Repair or replace damaged installed products.
 - .2 Clean installed products in accordance with manufacturer's instructions prior to Owner's acceptance.

END OF SECTION

PART 1 - GENERAL

- 1.1 General** .1 The "General Conditions" and "Supplementary General Conditions" shall form part of this section.
- 1.2 Reference Standards** .1 The Master Painters Institute (MPI) Architectural Painting specification manual.
.2 Workmanship shall conform to premium grade requirements of the Master Painters and Decorators Association of B.C., Architectural painting standards manual.
- 1.3 Submittals** .1 Product Data and MSDS sheets shall be submitted to the Departmental Representative for review for all proposed paints use on this project, as per *Section 01330 Submittals*.
- 1.4 Environmental Requirements** .1 Do not apply paint finish in areas where dust is being generated.
- 1.5 Acceptance** .1 Accept surface prepared by others. Commencement shall indicate acceptance except for the sealer coat applied to the Gypsum Wallboard substrate. This coat can be applied and once applied if it is found that the substrate is not acceptable then the drywall shall be made good under *Section 09250 Gypsum Wallboard*. Once the first coat of paint has been applied however the surface shall be deemed to be accepted.

PART 2 - PRODUCTS

- 2.1 Materials** .1 Paint materials for each coating formulae to be products of a single manufacturer.
.2 Only low VOC, low odor, durable paint materials are acceptable on this Project.
.1 All paint materials must be delivered in original containers with the seals unbroken and label intact and with manufacturer's instructions printed thereon.
.2 All painting materials to be of the best quality. They shall bear identifying labels on the containers.
.3 Paint to arrive on the job colour-mixed except for tinting of undercoats.
.4 Any thinning or tinting shall be as recommended by the manufacturer.
.5 Applicator to assume responsibility that all mixed colours match the colour selection provided by the Departmental Representative prior to the application of the coating.
- .3 Application Equipment:
.1 Application equipment is not required to be new, but shall be adequate for the work and workmanship required herein.

- .4 Accessory Material:
 - .1 To include all required ladders, scaffolding, drop cloths, masking, scrapers, tools, dusters cleaning solvents and waste, as required to perform the work and achieve the results herein specified.
- .5 Provide Owner with minimum 4 litres of each paint and stain colour for repairs and touch-up.

PART 3 - EXECUTION

3.1 Workmanship General

- .1 Only skilled applicators to be employed. Application may be by brush or roller.
- .2 Contractor to protect his work at all times, and to protect all adjacent work and materials by suitable covering or other approved methods during the progress of his work. Upon completion of his work, remove all paint and varnish spots from floors, glass and other surfaces. Remove all rubbish and accumulated materials of whatever nature not caused by others and leave work in clean, orderly and acceptable condition. Remove protective tape from all rated closure labels after final coat of paint.
- .3 Protect hardware, accessories, device plates, lighting fixtures, factory finished work and similar items, or provide ample in-place protection.
- .4 All materials to be applied under adequate illumination, spread evenly and smoothly to avoid runs, sags, brush marks, air bubbles and excessive roller stipple.
- .5 Coverage and hide to be complete. When colour, stain, dirt or undercoats show through final coat of paint, the surface is to be covered by additional coats until the paint film is of uniform finish, colour, appearance and coverage, at no additional cost to the Owner.
- .6 All coats to be dry to manufacturer's recommendations before applying succeeding coats.
- .7 Surfaces to be stained shall appear uniform in shading with colour variations caused only by the natural wood grain.

3.2 Preparation of Surfaces

- .1 General:
 - .1 Surfaces to be clean, dry and adequately protected from dampness.
 - .2 Surfaces to be free of any foreign materials that will adversely affect adhesion or appearance of applied coating.
 - .3 Mildew to be removed and the surface neutralized in accordance with the manufacturer's recommendations.
 - .4 Efflorescence on any area to be corrected before painting.
- .2a Wood to be Painted:
 - .1 Sandpaper to a smooth and even surface, dust off.

- .2 After priming coat has dried, putty all nail holes, cracks, open joints and other defects. Colour putty to match primer; if putty is not compatible with finish, spot prime puttied areas.
- .2b Wood to be Stained:
 - .1 Sandpaper to a smooth and even surface, dust off.
 - .2 To remove blemishes due to dirt, metal, weathering and light mould and mildew staining apply SANSIN Multi-Wash All Surface Cleaner by SANSIN to wood with sprayer, brush, roller, etc. as per manufacturers instruction.
- .3 Drywall:
 - .1 Fill all minor irregularities with spackling paste and sand to a smooth, level surface. Exercise care to avoid raising nap of paper.
- .4 Ferrous Metal Surfaces:
 - .1 Remove dirt and grease with mineral spirits and wipe dry with clean cloths.
 - .2 Remove rust and mill scale.
 - .3 Touch up all bare metal and damaged shop coats with specified shop coat primer.
 - .4 For ferrous surfaces with shop coats touched up, as above required, the first coat as listed in the following schedule will be applied to the dry mill film thickness as specified.
- .5 Exterior Galvanized Metal Surfaces:
 - .1 Galvanized metals to be tested for presence of Chromates. If Chromates are present prime as per MPI Manual and manufacturer's instructions for specified finish coat system.
- .6 Adjacent Surfaces:
 - .1 Caulk between surfaces to be painted (drywall, etc) and adjacent surfaces (aluminum windows, etc) with silicone to match colour of paint. Install after application of paint.

3.3 Workmanship, Interior Painting

- .1 Enamel or varnish applied to wood or metal shall be sanded with fine sandpaper and then cleaned between coats to produce an even surface.
- .2 Interior doors shall be sealed on the tops and bottoms with primer coat only. Side edges of interior doors shall be finished as faces of these doors.
- .3 Paint all miscellaneous unfinished mechanical and electrical components exposed to view.
- .4 All closet interiors shall be finished the same as adjoining rooms, unless otherwise specified.

3.4 Exterior Painting Schedule

- .1 The following refers to MPI code numbers and are required to all areas designated on the Drawings as requiring finishing. Use premium grade standard for each MPI code number.
- .2 Wood: exterior structural wood, decking:
 - .1 Two (2) coats Broda Pro-Tek-Tor Siding Log Timber (SLT), Colour to be approved by Departmental Representative and,
one (1) coat Broda Pro-Tek-Tor Siding Log Timber Clear (SLT) UV Top Coat by CBR Products.
- .3 Miscellaneous Metals (steel doorframes and doors):
Ext. 5.1D-G5 Alkyd, Semi-Gloss. Use this finish on all steel doorframes.
Colour: As per *Section 09999 Color and Finish Schedule*.
- .4 Exterior Structural Steel (Previously Galvanized):
EXT 5.3K Light Industrial Coating over Epoxy Primer
2 Coats W.B. Light Industrial Coating 163: (semi gloss)
Epoxy Primer 101 over MP1 25 (clean / etch). Substrate preparation following MPI Manual and manufacturer's instructions. (see also chromate testing in 3.2.6 above).
Colour: As per *Section 09999 Color and Finish Schedule*.
- .5 Exterior Miscellaneous Metals (Previously Galvanized):
EXT 5.3K Light Industrial Coating over Epoxy Primer
2 Coats W.B. Light Industrial Coating 163: (semi gloss)
Epoxy Primer 101 over MP1 25 (clean / etch). Substrate preparation following MPI Manual and manufacturer's instructions. (see also chromate testing in 3.2.6 above).
(This system also includes the Round HSS galvanized steel RWLs).
Colour: As per *Section 09999 Color and Finish Schedule*.

3.5 Interior Painting Schedule

- .1 The following refers to MPI code numbers and are required to all areas designated on the Drawings. Use premium grade standard for each MPI code number quoted.
- .2 Interior Wood (painted): Wood Doors, MDF Window Sills, and MDF Base Boards. Int. 6.3.A Acrylic Latex Paint Satin Finish.
Colour: As per *Section 09999 Color and Finish Schedule*.
- .3 Wood Ceiling Slats (See Drawings for location):
Colour and finish as per *Section 09999 Color and Finish Schedule*.
- .4 Gypsum Wallboard: Int. 9.2.A Latex Flat Finish. Use this finish except where noted in 3.5.5.
- .5 Gypsum Wallboard: Int.9.2.A Latex Semi-Gloss Finish on washrooms, bathing room, lab/water testing, janitor room, dental treatment/laboratory and kitchen. (Walls & Ceilings).
- .6 Miscellaneous Metals: INT **5.1B/5.1Q Semi-Gloss** Finish. Use this finish on structural steel; control panels, steel doors and frames, machinery, exposed HVAC ducts, exposed sprinkler

pipes, rails, radiators, registers, vents, sash, pipes, and steel deck ceilings (unless factory finished).

Colour: As per *Section 09999 Color and Finish Schedule*.

END of SECTION

PART 1 – GENERAL

- 1.1 General**
- .1 The "General Conditions" and "Supplementary General Conditions" shall form part of this section.
 - .2 All colours and patterns to be selected and approved by the Departmental Representative from the Manufacturers' full extended range unless noted otherwise.
 - .3 Extents of colours and finishes as noted below and as noted in the Drawings.
- 1.2 Submittals**
- .1 Shop Drawings: Submit shop drawings to indicate materials, details, and accessories in accordance with *Section 01330 Submittals*.

PART 2 – EXTERIOR

- 2.1 'Mini Reveal' Metal Cladding (W1a)**
- .1 Colour as selected by Departmental Representative.
- 2.2 Window Frames (Vinyl)**
- .1 Colour as selected by Departmental Representative.
- 2.3 Louvres and Vents**
- .1 Colour matched to adjacent metal surface/ cladding. See *Section 09900 Painting* for additional requirements.
- 2.4 Exterior Steel Doors & Frames**
- .1 Two (2) Finish Coats. Selected by Departmental Representative from Benjamin Moore Full Premium Colour from Best Quality Range. See *Section 09900 Painting* for additional requirements.
- 2.5 Structural Steel & Miscellaneous Steel**
- .1 Two (2) Finish Coats Light Industrial Coating: Colour selected by Departmental Representative to match Benjamin Moore Full Premium Colour from Best Quality Range. See *Section 09900 Painting* for additional requirements.
- 2.6 Exterior Structural Wood/ Decking**
- .1 Colour as selected by Departmental Representative. See *Section 09900 Painting* for additional requirements.
- 2.7 Finish Hardware**
- .1 Brushed stainless steel (626) unless noted otherwise. See *Section 08700 Finish Hardware* for additional requirements.
- 2.8 Pre-Finished Flashings: Roof**
- .1 Colour as selected by Departmental Representative. See *Section 07620 Metal Flashing and Trim* for additional requirements.

- 2.9 Pre-Finished Flashings:
Window** .1 Colour as selected by Departmental Representative.
See *Section 07620 Metal Flashing and Trim* for additional requirements.
- 2.10 Pre-Finished Flashings:
Metal Cladding** .1 Colour to match adjacent 'Mini Reveal' Metal Cladding. Colour as selected by Departmental Representative.
See *Section 07620 Metal Flashing and Trim* for additional requirements.
- 2.11 Pre-Finished
Roof Drains/ Exposed
Metal Gutters/
Metal RWLs** .1 Colour (to match roof flashing).
See *Section 07620 Metal Flashing and Trim* and *Section 07710 Roof Drains and Rainwater Leaders*.
- 2.12 Asphalt Roof Shingles** .1 Colour (grey) to be confirmed by Departmental Representative during sample submittal process from Manufacturer's standard product colour range.
See *Section 07310 Asphalt Shingles* for additional requirements.

PART 2 – INTERIOR

- 3.1 Walls** .1 Gypsum Wallboard: Two (2) coats. Selected by Departmental Representative from Benjamin Moore Full Premium Colour from Best Quality Range.
See *Section 09900 Painting* for additional requirements.
- 3.2 Ceilings** .1 Two (2) coats. White - shade selected by Departmental Representative from Benjamin Moore Full Premium Colour from Best Quality Range.
See *Section 09900 Painting* for additional requirements.
- 3.3 Flooring** .1 Resilient Flooring: See Drawings for locations. Colour and finish to be determined by Departmental Representative.
See *Section 09650 Resilient Flooring*.
- 3.4 Wood Doors** .1 Two (2) coats. Selected by Departmental Representative from Benjamin Moore Full Premium Colour from Best Quality Range.
See *Section 09900 Painting* for additional requirements.
- 3.5 MDF Window Sills/**

- | | | | |
|------------|-----------------------------|----|--|
| | Wall Base | .1 | Two (2) coats. Selected by Departmental Representative from Benjamin Moore Full Premium Colour from Best Quality Range (Painted to match adjacent gypsum wallboard).
See <i>Section 09900 Painting</i> for additional requirements. |
| 3.6 | Finish Hardware | .1 | Brushed stainless steel (626).
See <i>Section 08700 Finish Hardware</i> for additional Requirements. |
| 3.7 | Roller Blinds | .1 | Colour as selected by Departmental Representative.
See <i>Section 12510 Roller Shades</i> for additional requirements. |
| 3.8 | Washroom Accessories | .1 | Brushed stainless steel.
See <i>Section 10800 Washroom Accessories</i> for additional surface characteristics. |

END of SECTION

PART 1 - GENERAL

- 1.1 General** .1 The "General Conditions" and "Supplementary General Conditions" shall form part of this section.
- 1.2 Shop Drawings** .1 Submit shop drawings and/or product data for all items listed under Part 2 as per the requirements of *Section 01300 Submittals* and General Condition 34. Clearly indicate location, type, size and arrangements for each item as required.

PART 2 - PRODUCTS

- .1 Access Hatches Maxam Metal Product:
.1 Van-met model series with cylinder key lock.
.2 Single Leaf access panel 550mm wide x 900mm high, vertical swing.
.3 Coordinate the location of the Access Hatch Doors with roof truss framing and mechanical and electrical service installations.

PART 3 - EXECUTION

- 3.1 Installation** .1 Provide all Blocking and Backing as required for installation.
.2 Install in strict accordance with Manufacturer's Instructions.

END of SECTION

PART 1 - GENERAL

- 1.1 General** .1 The "General Conditions" and "Supplementary General Conditions" shall form part of this section.
- 1.2 Standards** .1 National Building Code of Canada, current edition.
- 1.3 Submittals** .1 Shop drawings shall be prepared and submitted for review to the Departmental Representative, as per *Section 01330 Submittals*.

PART 2 - PRODUCTS

- 2.1 Materials** .1 Washroom Accessories: Manufacturers as listed below or approved alternative (Manufacturers name and product numbers in brackets indicate pre-approved alternates). Finish to be brushed stainless steel.
- Shower Rod, Curtain and Rings:
"Bobrick"- Type 304 Stainless Steel, Satin Finish, 20 Gauge, 32mm dia rod, length to suit, concealed wall brackets.
Curtain Size to suit; Rings Stainless Steel to suit.
- Mirror Non-Sloped:
"Bobrick B-165 2436" 61x91 cm (24"x36")
Approved Alternate: "Bradley 780-2436" 61x91 cm (24"x36")
- Paper Towel Dispenser:
"Bobrick B-2621"
Approved Alternate: "Bradley 252"
- Waste Receptacle Recessed:
"Bobrick B-3644 Classic Series"
Approved Alternate: "Bradley 344-10"
- Toilet Tissue Dispenser:
"Bobrick B-2888 Multi-role Classic Series".
- Soap Dispensers:
"Bobrick B-4112 Contura"
Approved Alternate: "Bradley 6563-000000"
- Coat Hooks:
See *Section 08700 Finish Hardware*.

PART 3 - EXECUTION

- 3.1 Installation** .1 Install washroom accessories specified herein to locations indicated on drawings, anchoring all components firmly in place, in accordance with manufacturer's printed instructions.
- .2 All hardware and accessories to have solid backing.
- .3 Work shall be neat, accurate, plumb, in-line and securely fastened.
- .4 Install all work in accordance with manufacturer's instructions.

END OF SECTION

PART 1 - GENERAL

- 1.1 General** .1 The "General Conditions" and "Supplementary General Conditions" shall form an integral part of this section.
- 1.2 Submittals** .1 Shop drawings shall be prepared and submitted for review to the Departmental Representative, as per *Section 01330 Submittals*. Include illustrations of accessory components such as valances, details of head and sill conditions, corner conditions and conditions between adjacent blind units.

PART 2 - PRODUCTS

- 2.1 Materials** .1 Sunshade fabric roller shade as manufactured/supplied by Hunter Douglas, Levelor, Louvre Drape, New View Blinds or Fraser Shading Systems or approved alternate.
- .2 Refer to *Section 01600 Materials and Equipment* for procedures and submission requirements for substitutions.
- .3 Provide manually operated roller shade to all exterior windows; (1) one roller shade in each room.
- .4 Blinds to be "Inside Mounted" (mounted recessed into window opening with front face of blind header flush with surrounding wall) covered with prefinished metal valance/housing. Valance Colour: to match Aluminum window frame. Valance profile straight line square or box section.
- .5 Fabric/shade: Solid colour with sun screen 3-5% capability – submit sample for architect's approval. Acceptable Products: Phifer SheerWeave Style 2410 - 3% Openness; Fraser Shading Systems Inc. Solar Veil SV2300 Series. Colour to be selected by Departmental Representative from full manufacturer's range.

PART 3 - EXECUTION

- 3.1 Installation** .1 Install blinds in accordance with manufacturer's instructions.
- .2 Install intermediate support brackets as needed to prevent deflection of headrail.
- .3 Install blinds with adequate clearance to permit smooth operation of blinds and sash operators. Hold blinds 1/4" from each side of window opening on inside mount.
- .4 Ensure blinds to be in smooth, uniform working order.
- .5 Install valance so inside facing surface is flush with interior face of drywall.

END of SECTION