SPECIFICATION

for

Modular Labs

Centre for Aquaculture and Environmental Research
4160 Marine Drive, West Vancouver, B.C.

Project No. 2017575

prepared for: Fisheries and Oceans, Real Property

prepared by: Number Ten Architectural Group

November 30, 2017

SPECIFICATION

Division 8 – Openings

Division 9 – Finishes

Division 10 – Specialties

Division 12 – Furnishings

Division 21 – Mechanical

DIVISION 23 - HEATING, VENTILATING AND AIR CONDITIONING

DIVISION 26 - Electrical

DIVISION 27 – Communications

DIVISION 31 – Earthwork

APPENDICIES

DRAWINGS

Part 1 General

1.1 WORK COVERED BY CONTRACT DOCUMENTS

.1 Work of this Contract comprises the general construction of 2 freestanding lab buildings. The lab buildings are of modular construction. The labs are to be constructed at the Centre for Aquaculture and Environmental Research, 4160 Marine Drive, West Vancouver, B.C.

The Owner will supply the aluminum structural frame, and all of the fasteners required for the erection of this frame, insulated roof, floor and wall panels, associated flashings and all of the fasteners for the attachment of these panels. Shop drawings and construction details will be provided for these components.

The contractor will be responsible for erecting the pre fab aluminum structural frame and insulated panels.

The contractor will also supply and install the steel floor deck, all windows and doors, exterior stairs and ramps. All interior construction and electrical and mechanical components to be supplied and installed by the contractor under this contract. Interior finishes including but not limited to flooring, interior wall framing, finishes and painting, millwork and fixtures are to be supplied and installed by the contractor. Refer to individual specification sections and drawings.

1.2 CONTRACT METHOD

.1 Construct Work under a stipulated price contract.

1.3 CONTRACT DOCUMENTS

.1 The Contract documents, drawings and specifications are intended to complement each other, and to provide for and include everything necessary for the completion of the work.

.2 Drawings are, in general, diagrammatic and are intended to indicate the scope and general arrangement of the work.

.3 It will be the responsibility of the contractor to review the contract documents prior to the Submission of Tender, make themselves thoroughly acquainted with the requirements of the contract and to make whatever inquiries that are necessary to familiarize themselves with all conditions likely to affect the work.

1.4 DIVISION OF SPECIFICATIONS

.1 The specifications are subdivided in accordance with the current 6-digit National Master Specifications System.

.2 A division may consist of the work of more than 1 subcontractor. Responsibility for determining which subcontractor provides the labour, material, equipment and services required to complete the work rests solely with the Contractor.

.3 In the event of discrepancies or conflicts when interpreting the drawings and specifications, the specifications govern.

1.5 DOCUMENTS REQUIRED

.1 Maintain at job site, one copy of each document as follows:

- .1 Contract Drawings.
- .2 Specifications.
- .3 Addenda.
- .4 Reviewed Shop Drawings.
- .5 Change Orders.
- .6 Other Modifications to Contract.
- .7 Copy of Approved Work Schedule.
- .8 Health and Safety Plan and Other Safety Related Documents.
- .9 Other documents as specified.

1.6 WORK SCHEDULE

.1 Provide a schedule of work within 5 days of contract award and observe the following requirements

- .1 Work must be completed by March 25 2017
- .2 Whenever variation from the schedule in excess of 3 working days occurs or is expected to occur, notify the Departmental Representative and provide a revised schedule
- .3 Hours of work other than 8:00 AM to 5:00 PM Mondays to Fridays to be coordinated and confirmed acceptable with Departmental representative.

1.7 COST BREAKDOWN

.1 Before submitting the first progress claim, submit a breakdown of the Contract lump sum prices in detail as directed by the Departmental Representative and aggregating Contract price.

1.8 SITE CONDITIONS

.1 It will be the responsibility of the contractor to visit the site prior to the Submission of Tenders and make themselves thoroughly acquainted with the conditions at the site and to make whatever inquiries that are necessary to familiarize themselves with all conditions likely to affect the work.

1.9 CONTRACTOR USE OF PREMISES

.1 The contractor's use of site will be limited to the immediate area of the work and areas assigned by the Departmental Representative for site office placement, equipment, material stock piles, sanitary facilities, etc. Refer to drawings for proposed staging areas.

.2 Co-ordinate use of premises under direction of Departmental Representative.

.3 As there will be no access to any of the on-site buildings, the contractor will provide sanitary facilities for the work force in accordance with governing regulations and ordinances.

.4 Departmental Representative will designate areas for parking, material storage, recycling storage and a site office. Maintain these areas clean and free of construction related

debris. Make good damages resulting from contractors use of these areas at no cost to the contract.

.5 The site consists of two areas of work on either side of an access road. This road needs to be kept clear of debris at all times for fire truck and user access to the site. The road can be closed off with construction fencing, to restrict public access and for ease of movement within the site, provided this can be immediately removed as required for road access.

1.10 REFERENCES AND CODES

.1 Perform Work in accordance with National Building Code of Canada (NBC) including amendments up to tender closing date and other codes of provincial or local application provided that in case of conflict or discrepancy, more stringent requirements apply.

.2 Meet or exceed requirements of:

.1 Contract documents.

.2 Specified standards, codes and referenced documents.

.3 All work is to be performed in accordance with Worksafe B.C. regulations, Labour Canada regulations, and all applicable municipal statutes and authorities having jurisdiction. In the event of conflict between any provisions the most stringent provision will apply.

.4 Ensure that all employees have received appropriate WHIMIS training and that all necessary MSDS information is available on site.

1.11 PERMITS, FEES AND NOTIFICATIONS

.1 Obtain and pay for all permits and fees. Municipal building permit not required.

1.12 SUBMITTALS

.1 Submit to Departmental Representative submittals listed for review. Submit promptly and in orderly sequence to not cause delay in Work. Failure to submit in ample time is not considered sufficient reason for extension of Contract Time and no claim for extension by reason of such default will be allowed.

.2 Where specified, submit drawings stamped and signed by professional engineer registered or licensed in British Columbia.

.3 Submit shop drawings in .PDF format.

.4 Allow 5 working days for Consultant review of shop drawings.

1.13 ADDITIONAL DRAWINGS

.1 The Departmental representative may furnish additional drawings for clarification. These additional drawings have the same meaning and intent as if they were included with plans referred to in the contract documents.

1.14 RECORD DRAWINGS

.1 As work progresses, maintain accurate records to show all deviations from the contract documents. Record these changes on a clean set of drawings used only for this purpose.

Record changes in red ink. At completion, supply the Departmental Representative with one set of drawings and specifications with all changes clearly marked

1.15 ENVIRONMENTAL PROTECTION

.1 Comply with Federal, Provincial and Municipal laws orders and regulations concerning the protection of the environment and the control and abatement of soil, water, and air pollution.

.2 Place all waste, debris and lightweight materials in enclosed bins or under secure covers.

.3 Do not dispose of wastes or volatile materials into water courses, storm or sanitary sewers.

.4 All construction equipment to be in good working order, free of leaks that would contaminate the site

1.16 TEMPORARY FACILITIES

.1 Owner will provide continuous supply of potable water for construction use at no cost. Departmental Representative will determine delivery points. Contractor to provide all temporary equipment and hoses to bring the supply to the work. Exercise conservation whenever using the water supply. Do not leave hoses running unattended.

.2 Owner will supply electrical power at no cost. Departmental Representative will determine delivery points. Contractor to provide all temporary equipment and lines to bring the power supply to the work at no additional cost to the contract. Exercise conservation whenever using the power supply.

.3 Provide and maintain temporary fire protection required by the governing codes, bylaws and regulations during the performance of the work.

.4 Provide appropriate sanitary facilities for the workforce. Locate where directed by Departmental Representative.

.5 Contractor to provide temporary office of sufficient size to accommodate site meetings and store documents required on site. Furnish with a drawing laydown table.

.6 Provide and maintain, in clean and orderly condition, lockable weatherproof sheds for storage of tools, equipment and materials.

.7 Provide and maintain scaffolding and ladders.

.8 Provide fencing, hoarding and barriers as required to prevent public access to the worksite and as required by the Departmental Representative.

.9 Remove any temporary services or facilities after completion of the work and make good any damage to conditions previously existing or to match new work as acceptable to the Departmental Representative.

1.17 EXECUTION

.1 Execute cutting, fitting, and patching to complete Work.

.2 Fit several parts together, to integrate with other Work.

.3 Uncover Work to install ill-timed Work.

.4 Remove and replace defective and non-conforming Work.

.5 Provide openings in non-structural elements of Work for penetrations of mechanical and electrical Work.

.6 Execute Work by methods to avoid damage to other Work, and which will provide proper surfaces to receive patching and finishing.

.7 Fit Work to pipes, sleeves, ducts, conduit, and other penetrations through surfaces.

.8 Conceal pipes, ducts and wiring in floor, wall and ceiling construction of finished areas except where indicated otherwise.

1.18 MATERIALS AND EQUIPMENT

.1 Use new materials unless otherwise specified

1.19 OWNER FURNISHED ITEMS

.1 Owner Responsibilities:

.1 Provide shop drawings and materials necessary to construct the aluminum structure and insulated panels.

.2 Aluminum Structure & Insulated Panels: Arrange for delivery of shop drawings, product data, samples, manufacturer's instructions, and certificates to the contractor's representative.

.1 Arrange and pay for delivery to the contractor's site in accordance with Progress Schedule.

.2 Inspect deliveries with contractor; record shortages, and damaged or defective items.

.2 Contractor Responsibilities for Owner supplied items:

.1 Designate submittals and delivery date for each product in progress schedule.

.2 Review shop drawings, product data, samples, and other submittals. Submit to Consultant notification of observed discrepancies or problems anticipated due to non-conformance with Contract Documents.

.3 Aluminum structure & insulated panels:

.1 Arrange for replacement of damaged, defective or missing items.

.2 Submit claims for transportation damage.

.3 Handle products at site, including unloading, uncrating and storage.

.4 Protect products from damage, and from exposure to elements.

.4 Assemble, install, connect, adjust, and finish products.

.5 Provide installation inspections required by public authorities.

.6 Repair or replace items damaged by Contractor or subcontractor on site (under his control).

Part 2 Products

2.1 NOT USED

.1 Not used.

Part 3 Execution

3.1 NOT USED

.1 Not used.

END OF SECTION

Part 1 General

1.1 ADMINISTRATIVE

.1 Submit to Departmental Representative submittals listed for review. Submit promptly and in orderly sequence to not cause delay in Work. Failure to submit in ample time is not considered sufficient reason for extension of Contract Time and no claim for extension by reason of such default will be allowed.

.2 Do not proceed with Work affected by submittal until review is complete.

.3 Present shop drawings, product data, samples and mock-ups in SI Metric units.

.4 Where items or information is not produced in SI Metric units converted values are acceptable.

.5 Review submittals prior to submission to Departmental Representative. This review represents that necessary requirements have been determined and verified, or will be, and that each submittal has been checked and co-ordinated with requirements of Work and Contract Documents. Submittals not stamped, signed, dated and identified as to specific project will be returned without being examined and considered rejected.

.6 Notify Departmental Representative, in writing at time of submission, identifying deviations from requirements of Contract Documents stating reasons for deviations.

.7 Verify field measurements and affected adjacent Work are co-ordinated.

.8 Contractor's responsibility for errors and omissions in submission is not relieved by Departmental Representative's review of submittals.

.9 Contractor's responsibility for deviations in submission from requirements of Contract Documents is not relieved by Departmental Representative review.

.10 Keep one reviewed copy of each submission on site.

1.2 HEALTH AND SAFETY PLAN

.1 Submit site specific Health and Safety Plan, MSDS and WHMIS documents requested in Section 01 35 30 - Health and Safety

1.3 SHOP DRAWINGS AND PRODUCT DATA

.1 The term "shop drawings" means drawings, diagrams, illustrations, schedules, performance charts, brochures and other data which are to be provided by Contractor to illustrate details of a portion of 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 co-ordinated, regardless of Section under which adjacent items will be supplied and installed. Indicate cross references to design drawings and specifications.

.3 Allow 5 days for Departmental Representative's review of each submission.

.4 Adjustments made on shop drawings by Departmental Representative are not intended to change Contract Price. If adjustments affect value of Work, state such in writing to Departmental Representative prior to proceeding with Work.

.5 Make changes in shop drawings as Departmental Representative may require, consistent with Contract Documents. When resubmitting, notify Departmental Representative in writing of revisions other than those requested.

.6 Accompany submissions with electronic transmittal, containing:

- .1 Date.
- .2 Project title and number.
- .3 Contractor's name and address.
- .4 Indicate the specification section and paragraph number that applies to the shop drawing that is being submitted.
  - .1 Ensure that each shop drawing clearly refers to the requirements of the stated specification section.
- .5 Identification and quantity of each shop drawing, product data and sample.
- .6 Other pertinent data.

.7 Submissions include:

- .1 Date and revision dates.
- .2 Project title, number and applicable specification section.
- .3 Name and address of:
  - .1 Subcontractor.
  - .2 Supplier.
  - .3 Manufacturer.
- .4 Contractor's stamp, signed by Contractor's authorized representative certifying approval of submissions, verification of field measurements and compliance with Contract Documents.
- .5 Details of appropriate portions of Work as applicable:
  - .1 Fabrication.
  - .2 Layout, showing dimensions, including identified field dimensions, and clearances.
  - .3 Setting or erection details.
  - .4 Capacities.
  - .5 Performance characteristics.
  - .6 Standards.
  - .7 Operating weight.
  - .8 Wiring diagrams.
  - .9 Single line and schematic diagrams.
  - .10 Relationship to adjacent work.

.8 After Departmental Representative's review, distribute copies.

.9 Submit electronic copy of shop drawings for each requirement requested in specification Sections and as Departmental Representative may reasonably request.

.10 Submit electronic copies of test reports for requirements requested in specification Sections and as requested by Departmental Representative.

.1 Report signed by authorized official of testing laboratory that material, product or system identical to material, product or system to be provided has been tested in accord with specified requirements.

.2 Testing must have been within 3 years of date of contract award for project.

.11 Submit electronic copies of manufacturers instructions for requirements requested in Specification Sections and as requested by Departmental Representative.

.1 Pre-printed material describing installation of product, system or material, including special notices and Material Safety Data Sheets concerning impedances, hazards and safety precautions.

.12 Submit electronic copies of Manufacturer's Field Reports for requirements requested in specification Sections and as requested by Departmental Representative

.13 Submit 2 hard copies and electronic copy of Operation and Maintenance Data for requirements requested in specification Sections and as requested by Departmental Representative.

.14 Delete information not applicable to project.

.15 Supplement standard information to provide details applicable to project.

.16 If upon review by Departmental Representative no errors or omissions are discovered or if only minor corrections are made, copies will be returned and fabrication and installation of Work may proceed. If shop drawings are rejected, noted copy will be returned and resubmission of corrected shop drawings, through same procedure indicated above, must be performed before fabrication and installation of Work may proceed.

.17 The review of shop drawings by the Departmental Representative is for sole purpose of ascertaining conformance with general concept.

.1 This review shall not mean that the Departmental Representative approves detail design inherent in shop drawings, responsibility for which shall remain with Contractor submitting same, and such review shall not relieve Contractor of responsibility for errors or omissions in shop drawings or of responsibility for meeting requirements of construction and Contract Documents.

.2 Without restricting generality of foregoing, Contractor is responsible for dimensions to be confirmed and correlated at job site, for information that pertains solely to fabrication processes or to techniques of construction and installation and for co-ordination of work of sub-trades.

1.4 SAMPLES

.1 Submit for review samples in duplicate as requested in respective specification Sections. Label samples with origin and intended use.

.2 Deliver samples prepaid, one of each sample to Departmental Representatives office and Prime Consultant’s office.

.3 Notify Departmental Representative in writing, at time of submission of deviations in samples from requirements of Contract Documents.

.4 Where colour, pattern or texture is criterion, submit full range of samples.

.5 Adjustments made on samples by Departmental Representative are not intended to change Contract Price. If adjustments affect value of Work, state such in writing to Departmental Representative prior to proceeding with Work.

.6 Make changes in samples which Departmental Representative may require, consistent with Contract Documents.

.7 Reviewed and accepted samples will become standard of workmanship and material against which installed Work will be verified.

1.5 PHOTOGRAPHIC DOCUMENTATION

.1 Submit electronic copy of digital photography in jpg format, standard resolution as directed by Departmental Representative.

.2 Project identification: name and number of project and date of exposure indicated.

.3 Number of viewpoints: 4 locations.

.1 Viewpoints and their location as determined by Departmental Representative.

.4 Frequency of photographic documentation: weekly and as follows

.1 Upon completion of: Framing and services before concealment.

1.6 CERTIFICATES AND TRANSCRIPTS

.1 Immediately after award of Contract, submit Workers' Compensation Board status.

Part 2 Products

2.1 NOT USED

.1 Not Used.

Part 3 Execution

3.1 NOT USED

.1 Not Used.

END OF SECTION

Part 1 General

1.1 REFERENCES

.1 Canada Labour Code, Part 2, Canada Occupational Safety and Health Regulations

.2 Health Canada/Workplace Hazardous Materials Information System (WHMIS)

.1 Material Safety Data Sheets (MSDS).

.3 Province of British Columbia

.1 Workers Compensation Act, RSBC 1996 - Updated 2006.

.2 Occupational Health and Safety Regulation.

.4 National Building Code of Canada (NBC)

.1 Part 8, Safety Measures at Construction and Demolition Sites.

1.2 WORKERS COMPENSATION BOARD COVERAGE

.1 Comply fully with Workers' Compensation Act, regulations, and orders made pursuant thereto and any amendments up to the completion of work

.2 Maintain Workers' Compensation Board coverage during term of Contract, until and including date that Certificate of Final Completion is issued.

1.3 COMPLIANCE WITH REGULATIONS

.1 The Departmental Representative may terminate Contract without liability to Canada where Contractor, in the opinion of the Departmental Representative, refuses to comply with a requirement of Workers' Compensation Act or Occupational Health and Safety Regulations.

.2 Contractor is responsible to ensure that all workers are qualified, competent and certified to perform work as required by Workers' Compensation Act or Occupational Health and Safety Regulations.

1.4 SUBMITTALS

.1 Submit to Department Representative submittals listed for review.

.2 Work effected by submittal will not proceed until review is completed.

.3 Submit the following:

.1 Health and Safety Plan.

.2 Copies of reports or directions issued by Federal, Provincial and Territorial health and safety inspectors.

.3 Copies of incident and accident reports.

.4 Copies of Material Safety Data Sheets and all other documents required by Workplace Hazardous Materials Information System (WHMIS) requirements.

.5 Emergency procedures

.4 Submission of Health and Safety Plan and any revised version to the Departmental Representative is for information and reference purpose only. It will not:

.1 Be construed to imply as approval by Department Representative

.2 Be interpreted as warranty of being complete, accurate, and compliant.

.3 Relieve the Contractor of his legal obligations for provision of health and safety for the project.

.5 Medical Surveillance: where prescribed by legislation, regulation or safety program, submit certification of medical surveillance for site personnel prior to commencement of Work, and submit additional certifications for any new site personnel to Departmental Representative.

1.5 WORK PERMITS

.1 Obtain speciality permit(s) related to the project before start of work

1.6 FILING OF NOTICE

.1 Complete and submit Notice of Project as required by Provincial authorities.

.2 Provide copies of all notices to Department Representative.

1.7 SAFETY ASSESSMENT

.1 Perform site specific safety hazard assessment related to project.

1.8 MEETINGS

.1 Schedule and administer Health and Safety meeting with Departmental Representative prior to commencement of Work.

1.9 GENERAL REQUIREMENTS

.1 Develop written site-specific Health and Safety Plan based on hazard assessment prior to beginning site Work and continue to implement, maintain, and enforce plan until final demobilization from site. Health and Safety Plan must address project specifications.

.2 Departmental Representative may respond in writing, where deficiencies or concerns are noted and may request re-submission with correction of deficiencies or concerns.

1.10 GENERAL CONDITIONS

.1 Provide safety barricades and lights at work site as required to provide safe working environment for workers

.2 Ensure that non-authorized persons are not allowed in designated construction areas and work site.

.1 Provide appropriate means by use of barricades, fences, and warning signs.

1.11 REGULATORY REQUIREMENTS

.1 Comply with specified codes, acts, bylaws, standards, and regulations to ensure safe operations at site.

.2 In the event of conflict between any provision of above authorities, the most stringent provision will apply.

1.12 RESPONSIBILITY

.1 Be responsible for health and safety of persons on site, safety of property on site and for protection of persons adjacent to site and environment to extent that they may be affected by conduct of Work.

.2 Comply with and enforce compliance by employees with safety requirements of Contract Documents, applicable federal, provincial, territorial and local statutes, regulations, and ordinances, and with site-specific Health and Safety Plan.

1.13 UNFORSEEN HAZARDS

.1 When unforeseen or peculiar safety-related factor, hazard, or condition occur during performance of Work, follow procedures in place for Employee's Right to Refuse Work in accordance with Acts and Regulations having jurisdiction and advise Departmental Representative verbally and in writing.

1.14 HEALTH AND SAFETY CO-ORDINATOR

.1 Employ and assign to Work, competent and authorized representative as Health and Safety Co-ordinator. Health and Safety Co-ordinator must:

.1 Have site-related working experience specific to activities associated with the work outlined in the Contract.

.2 Have working knowledge of occupational safety and health regulations.

.3 Be responsible for completing Contractor's Health and Safety Training Sessions and ensuring that personnel not successfully completing required training are not permitted to enter site to perform Work.

.4 Be responsible for implementing, enforcing daily and monitoring site-specific Contractor's Health and Safety Plan.

.5 Be on site during execution of work.

1.15 HAZARDOUS PRODUCTS

.1 Comply with the requirements of Workplace hazardous Materials Information System (WHMIS) regarding use, handling, storage, and disposal of hazardous materials and regarding labelling and provision of Material Safety Data Sheets (MSDS) acceptable to Departmental Representative and in accordance with Canada Labour Code.

1.16 POSTING OF DOCUMENTS

.1 Ensure applicable items, articles, notices and orders are posted in conspicuous location on site in accordance with Acts and Regulations having jurisdiction, and in consultation with Departmental Representative.

1.17 CORRECTION OF NON-COMPLIANCE

.1 Immediately address health and safety non-compliance issues identified by authority having jurisdiction or by Departmental Representative.

.2 Provide Departmental Representative with written report of action taken to correct non-compliance of health and safety issues identified.

.3 Departmental Representative may stop Work if non-compliance of health and safety regulations is not corrected. The Contractor will be responsible for costs arising from such "stop work order".

1.18 CONFINED SPACES

.1 Carry out work in confined spaces in compliance with Provincial regulations.

1.19 OVERLOADING

.1 Ensure no part of the work is subject to a load which will endanger its safety or will cause permanent deformation

1.20 SCAFFOLDING

.1 Design, construct, and maintain scaffolding in a rigid, secure, and safe manner, in accordance with CSA Z797 and BC Occupational Health and Safety Regulations.

1.21 FIRE SAFETY REQUIREMENTS

.1 Store oily/paint soaked rags, waste products, 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 inflammable and combustible materials in accordance with the National Fire Code of Canada.

1.22 FIRE PROTECTION

.1 Do not use fire hydrants, standpipes, and hose systems for purposes other than firefighting

.2 Be responsible/liable for cost incurred from fire department, building owner, and tenants, resulting from false alarms

1.23 WORK STOPPAGE

.1 Give precedence to safety and health of public and site personnel and protection of environment over cost and schedule considerations for Work.

END OF SECTION

Part 1 General

1.1 QUALITY

.1 Products, materials, equipment and articles incorporated in Work shall be new, not damaged or defective, and of best quality for purpose intended. If requested, furnish evidence as to type, source and quality of products provided.

.2 Procurement policy is to acquire, in cost effective manner, items containing highest percentage of recycled and recovered materials practicable consistent with maintaining satisfactory levels of competition. Make reasonable efforts to use recycled and recovered materials and in otherwise utilizing recycled and recovered materials in execution of work.

.3 Defective products, whenever identified prior to completion of Work, will be rejected, regardless of previous inspections. Inspection does not relieve responsibility, but is precaution against oversight or error. Remove and replace defective products at own expense and be responsible for delays and expenses caused by rejection.

.4 Should disputes arise as to quality or fitness of products, decision rests strictly with Departmental Representative based upon requirements of Contract Documents.

.5 Unless otherwise indicated in specifications, maintain uniformity of manufacture for any particular or like item throughout building.

.6 Permanent labels, trademarks and nameplates on products are not acceptable in prominent locations, except where required for operating instructions, or when located in mechanical or electrical rooms.

1.2 STORAGE, HANDLING AND PROTECTION

.1 Handle and store products in manner to prevent damage, adulteration, deterioration and soiling and in accordance with manufacturer's instructions when applicable.

.2 Store packaged or bundled products in original and undamaged condition with manufacturer's seal and labels intact. Do not remove from packaging or bundling until required in Work.

.3 Store products subject to damage from weather in weatherproof enclosures.

.4 Store cementitious products clear of earth or concrete floors, and away from walls.

.5 Store sheet materials, lumber on flat, solid supports and keep clear of ground. Slope to shed moisture.

.6 Store and mix paints in heated and ventilated room. Remove oily rags and other combustible debris from site daily. Take every precaution necessary to prevent spontaneous combustion.

.7 Remove and replace damaged products at own expense and to satisfaction of Departmental Representative.

.8 Touch-up damaged factory finished surfaces to Departmental Representative's satisfaction. Use touch-up materials to match original. Do not paint over name plates.

1.3 TRANSPORTATION

.1 Pay costs of transportation of products required in performance of Work.

.2 Transportation cost of products supplied by Owner will be paid for by Departmental Representative. Unload, handle and store such products.

1.4 MANUFACTURER'S INSTRUCTIONS

.1 Unless otherwise indicated in specifications, install or erect products in accordance with manufacturer's instructions.

.2 Notify Departmental Representative in writing, of conflicts between specifications and manufacturer's instructions. Departmental Representative will establish course of action.

.3 Improper installation or erection of products, due to failure in complying with these requirements, authorizes Departmental Representative to require removal and re-installation at no increase in Contract Price or Contract Time.

1.5 QUALITY OF WORK

.1 Ensure Quality of Work is of highest standard, executed by workers experienced and skilled in respective duties for which they are employed.

.2 Do not employ anyone unskilled in their required duties.

.3 Decisions as to standard or fitness of Quality of Work in cases of dispute rest solely with Departmental Representative whose decision is final.

1.6 CO-ORDINATION

.1 Ensure co-operation of workers in laying out Work. Maintain efficient and continuous supervision.

.2 Be responsible for coordination and placement of openings, sleeves and accessories.

1.7 CONCEALMENT

.1 In finished areas conceal pipes, ducts and wiring in floors, walls and ceilings, except where indicated otherwise.

.2 Before installation inform Departmental Representative if there is interference. Install as directed by Departmental Representative.

1.8 REMEDIAL WORK

.1 Perform remedial work required to repair or replace parts or portions of Work identified as defective or unacceptable. Co-ordinate adjacent affected Work as required.

.2 Perform remedial work by specialists familiar with materials affected. Perform in a manner to neither damage nor put at risk any portion of Work.

1.9 LOCATION OF FIXTURES

.1 Consider location of fixtures, outlets, and mechanical and electrical items indicated as approximate.

.2 Inform Departmental Representative of conflicting installation. Install as directed.

.3 Submit field drawings to indicate relative position of various services and equipment when required by Departmental Representative.

1.10 FASTENINGS

.1 Provide metal fastenings and accessories in same texture, colour and finish as adjacent materials, unless indicated otherwise.

.2 Prevent electrolytic action between dissimilar metals and materials.

.3 Use non-corrosive hot dip galvanized steel fasteners and anchors for securing exterior work, unless stainless steel or other material is specifically requested in affected specification section.

.4 Space anchors within individual load limit or shear capacity and ensure they provide positive permanent anchorage. Wood, or any other organic material plugs are not acceptable.

.5 Keep exposed fastenings to a minimum, space evenly and install neatly.

.6 Fastenings which cause spalling or cracking of material to which anchorage is made are not acceptable.

1.11 FASTENINGS - EQUIPMENT

.1 Use fastenings of standard commercial sizes and patterns with material and finish suitable for service.

.2 Use heavy hexagon heads, semi-finished unless otherwise specified. Use No. 304 stainless steel for exterior areas.

.3 Bolts may not project more than one diameter beyond nuts.

.4 Use plain type washers on equipment, sheet metal and soft gasket lock type washers where vibrations occur. Use resilient washers with stainless steel.

1.12 PROTECTION OF WORK IN PROGRESS

.1 Prevent overloading of parts of building. Do not cut, drill or sleeve load bearing structural member, unless specifically indicated without written approval of Departmental Representative.

Part 2 Products

2.1 NOT USED

.1 Not Used.

Part 3 Execution

3.1 NOT USED

.1 Not Used.

END OF SECTION

1 PROJECT CLEANLINESS

.1 Maintain Work in tidy condition, free from accumulation of waste products and debris, other than that caused by Coast Guard personnel and by Other Contractors.

.2 Remove waste materials from site at regularly scheduled times or dispose of as directed by Departmental Representative.

.3 Make arrangements with and obtain permits from authorities having jurisdiction for disposal of waste and debris.

.4 Provide on-site containers for collection of waste materials and debris. Locate where directed by Departmental Representative.

.5 Provide and use clearly marked separate bins for recycling wherever facilities are available. Refer to Section 01 74 19 - Waste Management and Disposal for additional requirements.

.6 Remove waste material and debris from site and deposit in waste containers at end of each working day. Dispose of waste materials and debris off site.

.7 Clean interior areas prior to start of finishing work, and maintain areas free of dust and other contaminants during finishing operations.

.8 Store volatile waste in covered metal containers and remove from premises at end of each working day.

.9 Provide adequate ventilation during use of volatile or noxious substances. Do not use building ventilation system for this purpose.

.10 Use only cleaning materials recommended by manufacturer of surface to be cleaned and as recommended by cleaning material manufacturer.

.11 Schedule cleaning operations so that resulting dust, debris and other contaminants will not fall on wet, newly painted surfaces nor contaminate building systems.

2 FINAL CLEANING

.1 When Work is substantially completed, remove surplus products, tools, construction machinery and equipment not required for performance of remaining Work.

.2 Remove waste products and debris other than that caused by others and leave Work clean and suitable for occupancy.

.3 Prior to final review, remove surplus products, tools, construction machinery and equipment.

.4 Clean and polish glass, mirrors, hardware, wall tile, stainless steel, chrome, porcelain enamel, baked enamel, plastic laminate and mechanical/electrical fixtures. Replace broken, scratched and disfigured glass.

.5 Remove stains, spots, marks and dirt from decorative work, electrical and mechanical fixtures, furniture fitments, walls and floors.

.6 Clean lighting reflectors, lenses and other lighting surfaces.

.7 Vacuum clean and dust building interiors, behind grilles, louvres and screens.

.8 Inspect finishes, fitments and equipment and ensure specified workmanship and operation.

.9 Broom clean and wash exterior walks, steps and surfaces; rake clean other surfaces of grounds.

.10 Remove dirt and other disfiguration from exterior surfaces.

.11 Clean and sweep roofs, gutters, areaways and sunken wells.

.12 Sweep and wash clean paved areas and all pavement parking/storage areas used by Contractor to remove all traces of construction spillage, stains and residue. Do not blast dirty water onto adjacent buildings and site features.

.13 Clean equipment and fixtures to sanitary condition; clean or replace filters of mechanical equipment.

.14 Clean roofs, downspouts and drainage systems.

.15 Remove debris and surplus materials from crawl areas and other accessible concealed spaces.

3 WASTE MANAGEMENT AND DISPOSAL

.1 Separate waste materials for re-use and for recycling in accordance with Section 01 74 19 - Waste Management and Disposal.

END OF SECTION

Part 1 General

1.1 SECTION INCLUDES

.1 Waste goals.

.2 Waste management plan.

.3 Waste management plan implementation.

.4 Disposal of waste.

1.2 DEFINITIONS

.1 Clean Waste: Untreated and unpainted; not contaminated with oils, solvents, sealants or similar materials.

.2 Construction and Demolition Waste: Solid wastes typically including but not limited to, building materials, packaging, trash, debris, and rubble resulting from construction, re-modelling, repair and demolition operations.

.3 Hazardous: Exhibiting the characteristics of hazardous substances including, but not limited to, ignitability, corrosiveness, toxicity or reactivity.

.4 Non-hazardous: Exhibiting none of the characteristics of hazardous substances, including, but not limited to, ignitability, corrosiveness, toxicity, or reactivity.

.5 Non-toxic: Neither immediately poisonous to humans nor poisonous after a long period of exposure.

.6 Recyclable: The ability of a product or material to be recovered at the end of its life cycle and re-manufactured into a new product for reuse by others.

.7 Recycle: To remove a waste material from the Project site to another site for re-manufacture into a new product for reuse by others.

.8 Recycling: The process of sorting, cleansing, treating and reconstituting solid waste and other discarded materials for the purpose of using the altered form. Recycling does not include burning, incinerating, or thermally destroying waste.

.9 Return: To give back reusable items or unused products to vendors for credit.

.10 Reuse: To reuse a construction waste material in some manner on the Project site.

.11 Salvage: To remove a waste material from the Project site to another site for resale or reuse by others.

.12 Sediment: Soil and other debris that has been eroded and transported by storm or well production run-off water.

.13 Source Separation: The act of keeping different types of waste materials separate beginning from the first time they become waste.

.14 Toxic: Poisonous to humans either immediately or after a long period of exposure.

.15 Trash: Any product or material unable to be reused, returned, recycled, or salvaged.

.16 Volatile Organic Compounds (VOC): Chemical compounds common in and emitted by many building products over time through outgassing:

.1 Solvents in paints and other coatings,

.2 Wood preservatives; strippers and household cleaners,

.3 Adhesives in particle board, fibreboard, and some plywood; and foam insulation,

.4 When released, VOC's can contribute to the formation of smog and can cause respiratory tract problems, headaches, eye irritations, nausea, damage to the liver, kidneys, and central nervous system, and possibly cancer.

.17 Waste: Extra material or material that has reached the end of its useful life in its intended use. Waste includes salvageable, returnable, recyclable, and reusable material.

1.3 WASTE MANAGEMENT GOALS

.1 Owner has established that this Project shall generate the least amount of waste possible and that processes that ensure the generation of as little waste as possible due to error, poor planning, breakage, mishandling, contamination, or other factors shall be employed. The owners goal is to divert 75% of waste materials from the landfill.

.2 Owner recognizes that waste in any project is inevitable, but indicates that as much of the waste materials as economically feasible shall be reused, salvaged, or recycled.

.3 Waste disposal in landfills shall be minimized.

1.4 MATERIAL SOURCE SEPARATION PLAN

.1 Before project start-up, prepare Materials Source Separation Program. Provide separate containers for re-usable and/or recyclable materials of following:

.1 Construction waste: including but not limited to following types.

.1 Uncontaminated packaging (wood, metal banding, cardboard, paper, plastic wrappings, polystyrene).

.2 Wood pallets (recycle or return to shipper).

.3 Batt insulation.

.4 Metals (pipe, conduit, ducting, wiring, miscellaneous cuttings)

.5 Wood (uncontaminated).

.6 Gypsum board (uncontaminated).

.7 Paint, solvent, oil.

.8 Other materials as indicated in technical sections.

.2 Administration/worker waste (uncontaminated): including but not limited to following types.

.1 Paper, cardboard.

.2 Plastic containers and lids marked types 1 through 6.

.3 Glass and aluminum drink containers (recycle or return to vendor).

.2 Implement MSSP for waste generated on project in compliance with approved methods and as approved by Departmental Representative.

.3 Locate containers in locations, to facilitate deposit of materials without hindering daily operations.

.4 Locate separated materials in areas which minimize material damage.

1.5 STORAGE, HANDLING AND PROTECTION

.1 Store, materials to be reused, recycled and salvaged.

.2 All materials for recycling must be source separated into separate bins to be accepted by the local processing authority.

.3 Separate non-salvageable materials from salvaged items. Transport and deliver non-salvageable items to licensed disposal facility.

.4 Protect surface drainage, storm sewers, sanitary sewers, and utility services from damage and blockage.

Part 2 Products

2.1 NOT USED

.1 Not Used.

Part 3 Execution

3.1 PREPARATION

.1 Handle waste materials not reused, salvaged, or recycled in accordance with appropriate regulations and codes.

3.2 USE OF SITE AND FACILITIES

.1 Execute work with least possible interference or disturbance to normal use of premises.

3.3 WASTE MANAGEMENT IMPLEMENTATION

.1 Manager: Contractor to designate an on-site party responsible for instructing workers and overseeing the results of the Waste Management Plan the Project.

.2 Instruction: Contractor shall provide on-site instruction of appropriate separation, handling, and recycling, salvage, reuse, and return methods to be used by all parties at the appropriate stages of the Project.

.3 Separation facilities: Contractor shall lay out and label a specific area to facilitate separation of materials for potential recycling, salvage, reuse, and return. Recycling and waste bin areas are to be kept neat and clean and clearly marked in order to avoid contamination of materials.

.4 Hazardous wastes: Hazardous wastes shall be separated, stored, and disposed of according to local regulations.

3.4 DISPOSAL OF WASTE

.1 Burying of rubbish and waste materials is prohibited.

.2 Disposal of waste into waterways, storm, or sanitary sewers is prohibited.

3.5 CLEANING

.1 Remove tools and waste materials on completion of work, and leave work area in clean and orderly condition.

.2 Clean-up work area as work progresses.

.3 Source separate materials to be reused/recycled into specified sort areas.

END OF SECTION

Part 1 General

1.1 ADMINISTRATIVE REQUIREMENTS

.1 Acceptance of Work Procedures:

.1 Contractor's Inspection: Contractor and all subcontractors to conduct inspection of Work, identify deficiencies and defects, and repair as required to conform to Contract Documents.

.1 Notify Departmental Representative in writing of satisfactory completion of inspection and submit verification that corrections have been made.

.2 Request Departmental Representative's inspection.

.2 Departmental Representative's Inspection:

.1 Departmental Representative and Contractor to inspect Work and identify defects and deficiencies.

.2 Contractor to correct Work as directed.

.3 Completion Tasks: submit written certificates in English that tasks have been performed as follows:

.1 Work: completed and inspected for compliance with Contract Documents.

.2 Defects: corrected and deficiencies completed.

.3 Certificates required by authorities having jurisdiction have been submitted.

.4 Operation of systems have been demonstrated to the owner’s personnel

.5 Work is complete and ready for final inspection.

.4 Declaration of Substantial Performance: When Departmental Representative considers deficiencies and defects corrected and requirements of Contract substantially performed, make application for Certificate of Substantial Performance.

.5 Commencement of warranty period: Date of Departmental Representatives acceptance of substantial performance to be the date for commencement for warranty period.

.6 Payment of Holdback: after issuance of Substantial Performance of work, submit application for payment of holdback amount in accordance with contractual agreement.

.7 Final Inspection:

.1 When completion tasks are done, request final inspection of Work by Departmental Representative.

.2 If work is deemed incomplete by Departmental Representative, complete outstanding items and request re-inspection.

.8 Final Payment

.1 When Departmental Representative considers final deficiencies and defects corrected and requirements of contract met, make application for final payment.

.2 When work deemed incomplete by Departmental Representative complete outstanding items and request re-inspection.

1.2 FINAL CLEANING

.1 Remove surplus materials, excess materials, rubbish tools and equipment.

Part 2 Products

2.1 NOT USED

.1 Not Used.

Part 3 Execution

3.1 NOT USED

.1 Not Used.

END OF SECTION

Part 1 General

1.1 SECTION INCLUDES

.1 Closeout submittals

.2 Operation and maintenance manual format.

.3 Contents each volume.

.4 Recording actual site conditions.

.5 Record (as-built) documents and samples.

.6 Record documents.

.7 Warranties and bonds.

1.2 RELATED SECTIONS

.1 Section 01 33 00 - Submittal Procedures.

1.3 CLOSEOUT SUBMITTALS

.1 Prepare instructions and data using personnel experienced in maintenance and operation of described products.

.2 Submit preliminary copy for consultant review

.3 Copy will be returned with Consultant's comments.

.4 Revise content of documents as required prior to final submittal.

.5 Two weeks prior to Substantial Performance of the Work, submit to the Consultant, four final copies of operating and maintenance manuals in Canadian English.

.1 One copy of the manual to be provided in digital form on CD rom, in Canadian English.

.6 Ensure spare parts, maintenance materials and special tools required in individual specification sections are new, undamaged or defective, and of same quality and manufacture as products provided in Work.

.7 If requested, furnish evidence as to type, source and quality of products provided.

.8 Defective products will be rejected, regardless of previous inspections. Replace products at own expense.

.9 Pay costs of transportation.

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1.4 OPERATION AND MAINTENANCE MANUAL FORMAT

.1 Organize data in the form of an instructional manual.

.2 Binders: vinyl, hard covered, 3 'D' ring, loose leaf 219 x 279 mm with spine and face pockets.

.3 When multiple binders are used, correlate data into related consistent groupings. Identify contents of each binder on spine.

.4 Cover: Identify each binder with type or printed title “MAINTENANCE MANUAL”'; list title of project and identify subject matter of contents.

.5 Arrange content by systems, under Section numbers and sequence of Table of Contents.

.6 Provide tabbed fly leaf for each separate product and system, with typed description of product and major component parts of equipment.

.7 Text: Manufacturer's printed data, or typewritten data.

.8 Drawings: provide with reinforced punched binder tab. Bind in with text; fold larger drawings to size of text pages.

.9 Provide both .PDF electronic copy and hard copy submissions

.10 Coordinate with commissioning specification to include all related close out documentation, warranty and test reports.

1.5 CONTENTS - EACH VOLUME

.1 Table of Contents: provide title of project;

- .1 date of submission;
- .2 names, addresses, and telephone numbers of Consultant and Contractor with name of responsible parties; and
- .3 schedule of products and systems, indexed to content of volume.

.2 For each product or system, list names, addresses and telephone numbers of subcontractors and suppliers, including local source of supplies and replacement parts.

.3 Product Data: Mark each sheet to clearly identify specific products and component parts, and data applicable to installation; delete inapplicable information. Provide logical sequence of instructions for each procedure, incorporating manufacturer's instructions.

.4 Drawings: Supplement product data to illustrate relations of component parts of equipment and systems, to show control and flow diagrams.

1.6 RECORDING ACTUAL SITE CONDITIONS

.1 Record information on set of black line opaque drawings, and within the Project Manual, provided by Owner.

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.2 Annotate with coloured felt tip marking pens, maintaining separate colours for each major system, for recording changed information.

.3 Record information concurrently with construction progress. Do not conceal Work of the Project until required information is accurately recorded.

.4 Contract drawings and shop drawings: legibly mark each item to record actual construction, including:

.1 Measured depths of elements of foundation in relation to finish first floor datum.

.2 Measured horizontal and vertical locations of underground utilities and appurtenances, referenced to permanent surface improvements.

.3 Measured locations of internal utilities and appurtenances, referenced to visible and accessible features of construction.

.4 Field changes of dimension and detail.

.5 Changes made by change orders.

.6 Details not on original Contract Drawings.

.7 References to related shop drawings and modifications.

.5 Specifications: legibly mark each item to record actual construction, including:

.1 Manufacturer, trade name, and catalogue number of each product actually installed, particularly optional items and substitute items.

.2 Changes made by Addenda and change orders.

.6 Other Documents: maintain inspection certifications, field test records, required by individual specifications sections.

.7 Submit copy of record drawings and specifications to the Departmental Representative.

1.7 WARRANTIES AND BONDS

.1 Separate warranties and bonds with individual tab sheets keyed to the table of contents listing in the maintenance manual.

END OF SECTION

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Part 1 General

1.1 RELATED REQUIREMENTS

.1 Section 03 41 00: Concrete Blocks.

.2 Section 05 12 23: Structural Steel for Buildings.

1.2 REFERENCES

.1 All referenced standards to be the current edition or the edition referenced by the applicable Building Code in force at the time of building permit application, as noted on Structural Drawings.

.2 Canadian Standards Association (CSA International):

.1 CSA A23.1/A23.2, Concrete Materials and Methods of Concrete Construction/Methods of Test and Standard Practices for Concrete.

.2 CSA A283, Qualification Code for Concrete Testing Laboratories.

.3 CSA A3000, Cementitious Materials Compendium (Consists of A3001, A3002, A3003, A3004 and A3005).

.4 CSA S413, Parking Structures.

.3 ASTM International Inc.:

.1 ASTM C309, Standard Specification for Liquid Membrane-Forming Compounds for Curing Concrete.

.2 ASTM C920 – Standard Specification for Elastomeric Joint Sealants

.3 ASTM D1751, Standard Specification for Preformed Expansion Joint Filler for Concrete Paving and Structural Construction (Nonextruding and Resilient Bituminous Types).

.4 Canadian General Standards Board (CGSB):

.1 CGSB-51.34, Vapour Barrier, Polyethylene Sheet for Use in Building Construction.

1.3 QUALITY CONTROL

.1 Minimum two weeks prior to starting concrete work, provide valid certificate from plant delivering concrete.

.1 Provide test data and certification by qualified independent inspection and testing laboratory that materials and mix designs used in concrete mixture will meet specified requirements.

.2 For concrete with high volume of supplementary cementing materials (HVSCM concrete, as defined in CSA A23.1), perform trial mixes to ensure that the required properties are achieved.

.3 Minimum four weeks prior to starting concrete work, provide proposed quality control procedures on following items:

.1 Finishing.

.2 Protection.

1.4 ACTION AND INFORMATIONAL SUBMITTALS

.1 Provide submittals in accordance with Section 01 33 00 – Submittal Procedures.

.2 Minimum 2 weeks prior to starting concrete work, submit all concrete mix designs, and indicate where each concrete mix is to be used.

.3 Minimum submission requirements for each concrete mix design shall include the following:

- .1 Minimum specified compressive strength at 28 day (or at the time specified on drawings).
- .2 Maximum aggregate size.
- .3 Aggregate type (if not normal density).
- .4 Concrete density range, wet and dry (if not normal density).
- .5 CSA exposure class.
- .6 Cement type (if not type GU).
- .7 Percentage and type of supplemental cementing materials.
- .8 Maximum water/cementitious materials ratio.
- .9 Assumed method of placement of concrete.
- .10 Corrosion inhibitor (name and quantity, if applicable).
- .11 Plastic or steel fibres (type, name and quantity, if applicable).
- .12 Alkali-aggregate resistance.
- .13 Architectural requirements (colour of cement and aggregate, if applicable).
- .14 Maximum time from batching to placing concrete (if retarding admixtures are used).

.4 On completion of the works, provide written report to WSP-S certifying that the concrete in place meets performance requirements established in **PART 2 - PRODUCTS**.

Part 2 Products

2.1 DESIGN CRITERIA

.1 To CSA A23.1/A23.2, Alternative 1 – Performance, and as described under Mixes and on Structural Drawings.

2.2 PERFORMANCE CRITERIA

.1 Concrete supplier to meet the concrete performance criteria established by WSP-S and to provide verification of compliance.

2.3 MATERIALS

.1 Portland cement: to CSA A3001.

.2 Cementitious hydraulic slag: to CSA A3000.

.3 Fly ash: to CSA A3001, Type CI.

.4 Water: to CSA A23.1.

.5 Aggregates: to CSA A23.1/A23.2. Do not use recycled concrete as aggregate.

.6 Admixtures: not to contain chlorides.

.7 Corrosion-inhibiting admixture: calcium nitrite solution.

.8 Plastic fibre additive: fibrillated polypropylene fibres at least 19 mm (3/4") in length.

.9 Shrinkage compensating grout: premixed compound consisting of non-metallic aggregate, Portland cement, water reducing and plasticizing agents to CSA A23.1/A23.2. Minimum compressive strength: 40 MPa at 28 days.

.10 Non-premixed dry pack grout: composition of non-metallic aggregate and Portland cement with sufficient water for mixture to retain its shape when made into ball by hand and capable of developing compressive strength of 40 MPa at 28 days.

.11 Curing/sealing compound: to CSA A23.1/A23.2 and ASTM C309, Type 1, Class B, water based acrylic, compatible with surface hardener where hardener is used.

.12 Pre-moulded joint fillers: min.12 (1/2") bituminous impregnated fiber board to ASTM D1751.

.13 Penetrating sealer: water based, clear water repellent, at least equivalent to AT&U Type 1b as specified in Alberta Infrastructure and Transportation Publication B388.

.14 Bonding adhesive: synthetic latex.

.15 Crack Filler: low viscosity epoxy resin

2.4 CONCRETE MIXES

.1 Use ready-mix concrete. Proportion concrete in accordance with CSA A23.1, Alternative 1 - Performance Method for Specifying Concrete.

.2 Set performance characteristics of concrete in plastic state in coordination with all trades involved.

.3 Meet performance criteria of concrete in hardened state as shown on Structural Drawings and provide verification of compliance.

.4 Use water-reducing agent in all concrete.

.5 Do not use admixtures containing chlorides.

.6 Supplementary cementing materials (SCM):

.1 Conform to CSA A23.1.

.2 Follow slag and fly ash manufacturers' directions for proportioning and mixing of concrete.

.3 Do not use concrete with more than 40% of SCM when ambient temperature is forecast to be below +10ºC at the time of concrete pour and during the seven days after the pour, except for footings, walls and columns.

.4 Reduce W/C ratio to 0.45 where using more than 40% of SCM in concrete for slabs and other horizontal finished surfaces, in order to reduce bleed water and to increase rate or strength gain.

Part 3 Execution

3.1 PREPARATION

.1 Remove water and disturbed soil from excavations before placing concrete.

3.2 PLACING CONCRETE

.1 Place concrete in accordance with CSA A23.1.

.2 Delivery and place concrete with minimum re-handling.

.3 If concrete is pumped or placed pneumatically, control discharge velocity to prevent separation or scattering of concrete mix ingredients.

.4 Place concrete in a continuous operation without cold joints. If cold joints develop inadvertently, notify WSP-S to obtain instructions for required remedial work.

.5 Do not overload forms.

.6 Maintain accurate records of all poured concrete including extent, date and location of each pour, concrete mix used, ambient air temperature, test samples taken and falsework removal date and mark on a set of Structural Drawings.

3.3 FINISHING CONCRETE

.1 Finish concrete to CSA A23.1/A23.2.

.2 Cooperate with any trade applying finishes to concrete surfaces and provide surfaces which will ensure adequate bond. Provide chases and reglets where required.

.3 Finishing Formed Surfaces:

.1 Completely fill holes left by through-bolts with grout.

.2 Do not patch surfaces until instructed in writing by WSP-S.

3.4 CONCRETE CURING AND PROTECTION

.1 At a minimum cure and protect concrete in accordance with CSA A23.1

.2 Extend curing and protection period until concrete has reached following strength levels for structural safety:

.1 Footings: 50% of specified 28 day strength

.3 For concrete containing supplementary cementing materials, curing and protection times may need to be extended beyond those outlined by CSA A23.1 to achieve the required structural properties.

.4 Do not load concrete until sufficient strength is developed.

3.5 GROUTING UNDER BASE PLATES AND BEARING PLATES

.1 Grout under base plates and bearing plates using procedures in accordance with manufacturer's recommendations.

.2 Provide 100% contact over grouted area.

.3 Do not add load on aluminum framing until grouting is completed and grout strength has reached at least 20 MPa.

END OF SECTION

Part 1 General

1.1 RELATED REQUIREMENTS

.1 Section 05 12 23 - Structural Steel for Buildings

1.2 REFERENCE STANDARDS

.1 ASTM International

.1 ASTM A 1064/A 1064M-16b , Standard Specification for Carbon-Steel Wire and Welded Wire Reinforcement, Plain and Deformed, for Concrete.

.2 CSA Group

.1 CSA-A23.4-16, Precast Concrete - Materials and Construction.

1.3 DESIGN REQUIREMENTS

.1 Design precast elements to carry handling stresses.

1.4 PERFORMANCE REQUIREMENTS

.1 Tolerance of precast elements to CSA-A23.4.

1.5 ACTION AND INFORMATIONAL SUBMITTALS

.1 Submittals in accordance with Section 01 33 00- Submittal Procedures.

.2 Product Data:

.1 Submit manufacturer's instructions, printed product literature and data sheets for proprietary materials used in Precast Structural Concrete and include product characteristics, performance criteria, physical size, finish and limitations.

.3 Shop Drawings:

.1 Submit shop drawings prepared in accordance with CSA-A23.4 and include following items:

.1 Design calculations for items designed by manufacturer.

.2 Finishing schedules.

.3 Dimensions of finished units

.4 Quality Assurance Submittals:

.1 Submit concrete supplier's certification.

1.6 QUALIFICATIONS

.1 Fabricate and erect precast concrete elements by manufacturing plant certified in appropriate category according to CSA-A23.4

1.7 DELIVERY, STORAGE AND HANDLING

.1 Deliver, handle and store precast units according to manufacturer's instructions.

1.8 WARRANTY

.1 Warrant precast element not to spall or show visible evidence of corrosion of embedded steel and cracking, except for normal hairline shrinkage cracks, for 1 year.

Part 2 Products

2.1 CONCRETE BLOCK

.1 Pre cast concrete blocks to sizes and shapes indicated. Flat top. Recessed lifting hooks.

2.2 MATERIALS

.1 Cement to CAN/CSA-A3001, Type [GU].

.2 Water: potable .

.3 Reinforcing steel: to CAN/CSA-G30.18.

.4 Anchors and supports: to CAN/CSA-G40.21 Type 300 W galvanized after fabrication.

2.3 MIXES

.1 Concrete:

.1 Provide concrete mix to meet following hard state requirements:

.1 Minimum compressive strength at 28 days age: 20 MPa.

.2 Surface texture: steel trowel finish.

2.4 DIMENSIONS

.1 Blocks to be 750mm x 750mm mm x 1500mm,+/- 50mm.

.2 Top of block to be flat.

.3 Lifting hook to be recessed.

.4 Serial number and name of manufacturer shall be cast into the block.

2.5 FABRICATION

.1 Manufacture units in accordance with CSA-A23.4.

.2 Cast members in accurate rigid moulds designed to withstand high frequency vibration. Set reinforcing anchors and auxiliary items to indicated on shop drawings. Cast in anchors, blocking and inserts as required. Vibrate concrete during casting for full thickness.

.3 Provide lifting hooks and other inserts or fittings required for a complete and rigid installation. Each to conform to requirements of local codes. Lift hooks adequately sized to safely handle blocks according to member dimension and weight. Recess anchors.

.1 Lifting hook to have a minimum breaking strength of 15,000Kg and be designed by a professional engineer.

2.6 FINISHES

.1 Finish units to standard grade, to CSA-A23.4.

Part 3 Execution

3.1 INSTALLATION

.1 Install blocks in locations indicated.

3.2 CLEANING

.1 Progress Cleaning: clean in accordance with Section 01 74 00- Cleaning.

.1 Leave Work area clean at end of each day.

.2 Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment in accordance with Section 01 74 00- Cleaning.

END OF SECTION

Part 1 General

1.1 RELATED REQUIREMENTS

.1 Section 06 10 00 – Rough Carpentry

1.2 REFERENCES

.1 ASTM International Inc.

- .1 ASTM A36/A36M-08, Standard Specification for Carbon Structural Steel.
- .2 ASTM A193/A193M-08, Standard Specification for Alloy-Steel and Stainless Steel Bolting Materials for High-Temperature or High-Pressure Service and Other Special Purpose Applications.
- .3 ASTM A307-07b, Standard Specification for Carbon Steel Bolts and Studs, 60,000 PSI Tensile Strength.
- .4 ASTM A325M-08, Standard Specification for Structural Bolts, Steel, Heat Treated 830 MPa Minimum Tensile Strength Metric.
- .5 ASTM A992, Standard Specifications for Structural Steel Shapes.
- .6 ASTM F593 – 17, Standard Specification for Stainless Steel Bolts, Hex Cap Screws, and Studs

.2 Canadian General Standards Board (CGSB)

- .1 CAN/CGSB-85.10-99, Protective Coatings for Metals.

.3 Canadian Institute of Steel Construction (CISC)/Canadian Paint Manufacturers Association (CPMA).

- .1 Handbook of the Canadian Institute of Steel Construction.
- .2 CISC/CPMA Standard 2-75, Quick-Drying Primer for use on Structural Steel.

.4 Canadian Standards Association (CSA International)

- .1 CSA G40.20/G40.21-04, General Requirements for Rolled or Welded Structural Quality Steel/Structural Quality Steel.
- .2 CAN/CSA-S16-01(R2007), Limit States Design of Steel Structures.
- .3 CSA W47.1-03, Certification of Companies for Fusion Welding of Steel.
- .4 CSA W48-06, Filler Metals and Allied Materials for Metal Arc Welding.
- .5 CSA W55.3-1965(R2003), Resistance Welding Qualification Code for Fabricators of Structural Members Used in Buildings.
- .6 CSA W59-03, Welded Steel Construction (Metal Arc Welding).

.5 Master Painters Institute

- .1 MPI-INT 5.1-08, Structural Steel and Metal Fabrications.
- .2 MPI-EXT 5.1-08, Structural Steel and Metal Fabrications.

.6 The Society for Protective Coatings (SSPC) and National Association of Corrosion Engineers (NACE) International

- .1 NACE No. 3/SSPC SP-6-06, Commercial Blast Cleaning.

1.3 ACTION AND INFORMATIONAL SUBMITTALS

.1 Provide submittals in accordance with Section 01 33 00 - Submittal Procedures.

.2 Shop drawings:

.1 Submit shop drawings showing layout, components and connections.

.3 Source Quality Control Submittals:

.1 When requested submit two copies of mill test reports 4 weeks prior to fabrication of structural steel.

.1 Mill test reports to show chemical and physical properties and other details of steel to be incorporated in project.

.2 Provide mill test reports certified by metallurgists qualified to practice in Province of BC, Canada.

.4 Fabricator Reports:

.1 When requested provide structural steel fabricator's affidavit stating that materials and products used in fabrication conform to applicable material and products standards specified and indicated.

1.4 DELIVERY, STORAGE AND HANDLING

.1 Deliver, store and handle materials in accordance with Section 01 61 00 - Common Product Requirements.

.2 Deliver materials in manufacturer's original, undamaged containers with identification labels intact.

.3 Packaging Waste Management: remove for reuse and return of pallets, crates, padding, packaging materials in accordance with Section 01 74 21 - Construction/Demolition Waste Management and Disposal.

Part 2 Products

2.1 MATERIALS

.1 Structural steel: to CSA-G40.20/G40.21 Grade as indicated 350W.

.2 Anchor rods: stainless steel to ASTM F593 Group 1, minimum yield strength of 206 MPa.

.3 Bolts, nuts and washers: to ASTM A325M or, stainless steel, to match rod or bolt material.

.4 Welding materials: to CSA W48 Series and CSA W59 and certified by Canadian Welding Bureau.

.5 Shop paint primer: to CISC/CPMA2-75 solvent reducible alkyd.

.6 Hot dip galvanizing: galvanize steel, where indicated, to CAN/CSA-G164, minimum zinc coating of 600 g/m².

2.2 FABRICATION

.1 Fabricate structural steel in accordance with CAN/CSA-S16 and in accordance with reviewed shop drawings.

.2 Continuously seal members by continuous welds where indicated. Grind smooth.

.3 Provide holes in flanges.

2.3 SHOP PAINTING

.1 Clean, prepare surfaces and shop prime structural steel in accordance with CAN/CSA-S16 CAN/CSA-S136 except where members to be encased in concrete MPI INT 5.1.

.2 Clean members, remove loose mill scale, rust, oil, dirt and foreign matter. Prepare surface according to NACE No.3/SSPC-SP-6.

.3 Apply one coat of primer in shop to steel surfaces:

.1 Surfaces to be encased in concrete.

.2 Surfaces and edges to be field welded.

.3 Faying surfaces of slip-critical connections.

.4 Apply paint under cover, on dry surfaces when surface and air temperatures are above 5 degrees C.

.5 Maintain dry condition and 5 degrees C minimum temperature until paint is thoroughly dry.

.6 Strip paint from bolts, nuts, sharp edges and corners before prime coat is dry.

Part 3 Execution

3.1 APPLICATION

.1 Manufacturer's Instructions: comply with manufacturer's written recommendations, including product technical bulletins, handling, storage and installation instructions, and datasheets.

3.2 GENERAL

.1 Structural steel work: in accordance with CAN/CSA-S16.

.2 Welding: in accordance with CSA W59.

.3 Companies to be certified under Division 1 or 2.1 of CSA W47.1 for fusion welding of steel structures and/or CSA W55.3 for resistance welding of structural components.

3.3 CONNECTION TO EXISTING WORK

.1 Verify dimensions and condition of existing work, report discrepancies and potential problem areas to Departmental Representative for direction before commencing fabrication.

3.4 MARKING

.1 Mark materials in accordance with CSA G40.20/G40.21. Do not use die stamping. When steel is to be left in unpainted condition, place marking at locations not visible from exterior after erection.

.2 Match marking: shop mark bearing assemblies and splices for fit and match.

3.5 ERECTION

.1 Erect structural steel, as indicated and in accordance with CAN/CSA-S16 and in accordance with reviewed erection drawings.

.2 Field cutting or altering structural members: to approval of Departmental Representative.

.3 Clean with mechanical brush and touch up shop primer to bolts, rivets, welds and burned or scratched surfaces at completion of erection.

.4 Continuously seal members by continuous welds where indicated. Grind smooth.

3.6 FIELD QUALITY CONTROL

.1 Inspection and testing of materials and workmanship will be carried out by testing laboratory designated by Departmental Representative.

.2 Provide safe access and working areas for testing on site, as required by testing agency and as authorized by Departmental Representative.

.3 Submit test reports to Departmental Representative within two weeks of completion of inspection.

.4 Contractor will pay costs of tests as specified in Section 01 29 83 - Payment Procedures for Testing Laboratory Services.

3.7 FIELD PAINTING

.1 Paint in accordance with Section 09 91 23 - Interior Painting.

.1 Touch up damaged surfaces and surfaces without shop coat with primer to NACE No.3/SSPC-SP-6 except as specified otherwise. Apply in accordance: MPI Architectural Painting Specification Manual.

3.8 CLEANING

.1 Clean in accordance with Section 01 74 11 - Cleaning.

.2 Waste Management: separate waste materials for reuse, recycling in accordance with Section 01 74 21 - Construction/Demolition Waste Management and Disposal.

END OF SECTION

Part 1 General

1.1 RELATED SECTIONS

.1 Section 09 90 00 - Painting.

.2 Section 07 41 16 Pre-Fabricated Wall and Roof Panels

1.2 REFERENCES

.1 Aluminum Association, Inc. (AA)

.1 Designation System for Aluminum Finishes [1997].

.2 American Welding Society (AWS)

.1 A5.10/A5.10M[1999], Specification for Bare Aluminum and Aluminum Alloy Welding Electrodes and Rods.

.3 Canadian Standards Association (CSA International)

.1 CAN3-S157-M83(R2000), Strength Design in Aluminum.

.2 CSA W47.2-M1987(R1998), Certification of Companies for Fusion Welding of Aluminum.

.3 CSA W59.2-M1991(R1998), Welded Aluminum Construction.

.4 Master Painters Institute (MPI)

.1 MPI - EXT 5.5D, Bituminous Paint.

1.3 WASTE MANAGEMENT AND DISPOSAL

.1 Divert unused metal from landfill to metal recycling facility.

.2 Dispose of unused paint material at official hazardous material collections site.

.3 Do not dispose of unused paint material into sewer system, into streams, lakes, onto ground or in other locations where it will pose health or environmental hazard.

Part 2 Products

N/A.

Part 3 Execution

3.1 GENERAL

.1 Structural aluminum work: in accordance with CAN3-S157.

.2 Welding: in accordance with CSA W59.2.

.3 Companies to be certified under Division 1 or 2.1 of CSA W47.2 for fusion welding of aluminum and/or CSA W55.3 for resistance welding of structural components.

3.2 CONNECTION TO EXISTING WORK

.1 Verify dimensions and condition of existing work, report discrepancies and potential problem areas to Department Representative for direction before commencing fabrication.

3.3 ERECTION

.1 Erect structural aluminum as indicated and in accordance with CAN3-S157 and approved erection drawings.

.2 Field cutting or altering structural members: to approval of Departmental Representative.

3.4 JOINT SEALING AND PAINTING

.1 Surface preparation of aluminum in contact with or embedded in dissimilar materials: to CAN3-S157. All locations to be treated as if they are in presence of moisture.

.2 Paint in accordance with CAN3-S157.

3.5 FIELD PAINTING

.1 Paint in accordance with Section 09 90 00 - Painting.

.1 Touch up damaged surfaces with one coat of zinc chromate primer followed by one coat of compatible paint.

END OF SECTION

Part 1 General

1.1 RELATED SECTIONS

.1 Section 05 41 11 - Structural Aluminum Assembly

.2 Section 07 13 26 - Self Adhered Sheet Membrane

.3 Section 07 41 16 – Pre –Fabricated Wall and Roof Panels

1.2 REFERENCES

.1 American Society for Testing and Materials International, (ASTM)

.1 ASTM A653/A653M-01a, Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.

.2 ASTM A792/A792M-01a, Specification for Steel Sheet, 55%Aluminum-Zinc Alloy-Coated by the Hot-Dip Process.

.2 Canadian General Standards Board (CGSB)

.1 CAN/CGSB-1.181-99, Ready-Mixed Organic Zinc-Rich Coating.

.3 Canadian Standards Association (CSA International)

.1 CAN/CSA-S16.1-94(R2000), Limit States Design of Steel Structures.

.2 CSA-S136-94(R2001), Cold Formed Steel Structural Members.

.4 Canadian Sheet Steel Building Institute (CSSBI)

.1 CSSBI 10M-96, Standard for Steel Roof Deck.

.2 CSSBI 12M-96, Standard for Composite Steel Deck.

1.3 DESIGN REQUIREMENTS

.1 Design steel deck using limit states design in accordance with CSA S136 and CSSBI 10M.

.2 Steel deck and connections to steel framing to carry dead, live and other loads including lateral loads, diaphragm action, composite deck action, and uplift as indicated.

.3 Deflection under specified live load not to exceed 1/360 of span.

1.4 SHOP DRAWINGS

.1 Submit shop drawings in accordance with Section 01 33 00 Submittal procedures.

.2 Indicate deck plan, profile, dimensions, base steel thickness, metallic coating designation, connections to supports and spacings, projections, openings, reinforcement details and accessories.

1.5 WASTE MANAGEMENT AND DISPOSAL

.1 Separate and recycle waste materials in accordance with Section 01 74 19 Construction Waste Management and Disposal.

.2 Divert unused metal from landfill to metal recycling facility.

Part 2 Products

2.1 MATERIALS

.1 Steel deck units shall be formed of zinc-coated sheet steel minimum CSSBI 10M Grade A with a base nominal thickness of 0.91mm or greater. Unless noted otherwise, zinc coatings shall be:

.1 Interior Exposure: Floors ZF75 - wipe coat

.2 Exterior Exposure: Z275.

.2 Touch-up paint shall conform to CGSB - 1.181 Ready-Mixed Organic Zinc Rich Coating.

.3 Cover plates, cell closures and flashings: shall be the same material as the deck with a minimum nominal thickness of 0.76 mm.

.4 Deck shall conform to the depths and dimensions shown on the drawings

.5 Attachment screws: Hex head self tapping 12-14 x 19mm steel screws.

Part 3 Execution

3.1 GENERAL

.1 Structural steel work: in accordance with CAN/CSA-S136 and CSSBI 10M.

3.2 ERECTION

.1 Erect steel deck as indicated and in accordance with CSA S136 and CSSBI 10M and in accordance with approved erection drawings.

.2 Isolate steel deck from aluminum structure with strips of self adhesive membrane

.3 Fasten steel decking to aluminum frame using self tapping screws

.4 Immediately after deck is permanently secured in place, touch up metallic coated top surface with compatible primer where necessary.

3.3 OPENINGS AND AREAS OF CONCENTRATED LOADS

.1 No reinforcement required for openings cut in deck which are smaller than 150 mm square.

.2 Frame deck openings with any one dimension between 150 to 300 mm as recommended by manufacturer, except as otherwise indicated.

.3 For deck openings with any one dimension greater than 300 mm and for areas of concentrated load, reinforce in accordance with structural framing details, except as otherwise indicated.

END OF SECTION

Part 1 General

1.1 RELATED REQUIREMENTS

.1 Section 09 90 00 - Painting

1.2 REFERENCES

.1 ASTM International

.1 ASTM A53/A53M-07, Standard Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated Welded and Seamless.

.2 ASTM A307-07b, Standard Specification for Carbon Steel Bolts and Studs, 60,000 PSI Tensile Strength.

.2 CSA International

.1 CSA G40.20/G40.21-04(R2009), General Requirements for Rolled or Welded Structural Quality Steel/Structural Quality Steel.

.2 CAN/CSA G164-M92(R2003), Hot Dip Galvanizing of Irregularly Shaped Articles.

.3 CSA W59-M03(R2008), Welded Steel Construction (Metal Arc Welding) Metric.

.3 Health Canada / Workplace Hazardous Materials Information System (WHMIS)

.1 Material Safety Data Sheets (MSDS).

.4 The Master Painters Institute (MPI)

.1 Architectural Painting Specification Manual - [current edition].

1.3 SUBMITTALS

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

.2 Product Data:

.1 Submit copies of WHMIS MSDS in accordance with Section 01 35 30 - Health and Safety Requirements.

.1 For finishes, coatings, primers, and paints applied on site: indicate VOC concentration in g/L.

.3 Shop Drawings:

.1 Submit drawings stamped and signed by professional engineer registered or licensed in Province British Columbia, Canada.

.2 Indicate materials, core thicknesses, finishes, connections, joints, method of anchorage, number of anchors, supports, reinforcement, details, and accessories.

1.4 CLOSEOUT SUBMITTALS

.1 Make submissions in accordance with Section 01 78 10 - Closeout Submittals.

.2 Provide certification under seal of same engineer responsible for sealing shop drawings that steel decks have been installed in accordance with sealed shop drawings.

1.5 DELIVERY, STORAGE AND HANDLING

.1 Deliver, store and handle materials in accordance with Section 01 61 00 - Common Product Requirements.

.2 Delivery and Acceptance Requirements: deliver materials to site in original factory packaging, labelled with manufacturer's name and address.

.3 Storage and Handling Requirements:

.1 Store materials off ground and in accordance with manufacturer's recommendations in clean, dry, well-ventilated area.

.2 Replace defective or damaged materials with new.

1.6 SYSTEM DESCRIPTION

.1 Design metal deck, stair, ramp and railing construction and connections to NBC vertical and horizontal live load requirements.

1.7 MATERIALS

.1 Steel sections and plates: to CSA G40.20/G40.21, Grade 300W

.2 Floor plate: to CSA G40.20/G40.21, Grade 260W

.1 Thickness: as indicated.

.2 Width: as indicated.

.3 Design: as indicated.

.3 Steel pipe: to ASTM A53/A53M standard weight, schedule 40, seamless black.

.4 Welding materials: to CSA W59.

.5 Bolts and anchor bolts: to ASTM A307.

1.8 STEEL DECKING

.1 11 Gauge safety tread decking, with perforated dimples.

1.9 STEEL MESH

.1 Expanded boiler plate, de-burred, hot dip galvanized.

1.10 FABRICATION

.1 Fabricate work square, true, straight and accurate to required size, with joints closely fitted and properly secured.

.2 Use self-tapping shake-proof flat headed screws on items requiring assembly by screws or as indicated.

.3 Where possible, fit and shop assemble work, ready for erection.

.4 Ensure exposed welds are continuous for length of each joint. File or grind exposed welds smooth and flush.

.5 Weld connections where possible, otherwise bolt connections. Countersink exposed fastenings, cut off bolts flush with nuts. Make exposed connections of same material, colour and finish as base material on which they occur.

.6 Shop fabricate deck and railings in sections as large and complete as practicable.

1.11 FINISHES

.1 All metal to be hot dipped galvanized

.1 Galvanizing: hot dipped galvanizing with zinc coating 600 g/m^2 to CAN/CSA-G164.

.2 Zinc primer: zinc rich, ready mix to CAN/CGSB-1.181.

.3 Shop coat primer: MPI-EXT 5.

Part 2 Execution

2.1 EXAMINATION

.1 Verification of Conditions: verify conditions of substrates previously installed under other Sections or Contracts are acceptable for metal fabrications installation in accordance with manufacturer's written instructions.

.1 Visually inspect substrate.

.2 Inform Departmental Representative] of unacceptable conditions immediately upon discovery.

.3 Proceed with installation only after unacceptable conditions have been remedied

2.2 ERECTION

.1 Do welding work in accordance with CSA W59 unless specified otherwise.

.2 Erect metalwork square, plumb, straight, and true, accurately fitted, with tight joints and intersections.

.3 Provide suitable means of anchorage.

.4 Exposed fastening devices to match finish and be compatible with material through which they pass.

.5 Supply components for work by other trades in accordance with shop drawings and schedule.

.6 Touch-up rivets, field welds, bolts and burnt or scratched surfaces with primer after completion of assembly

2.3 CLEANING

.1 Progress Cleaning: clean in accordance with Section 01 74 11 - Cleaning.

.1 Leave Work area clean at end of each day.

.2 Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment in accordance with Section 01 74 11 - Cleaning.

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

.1 Remove recycling containers and bins from site and dispose of materials at appropriate facility.

2.4 PROTECTION

.1 Protect installed products and components from damage during construction.

.2 Repair damage to adjacent materials caused by metal fabrications installation.

END OF SECTION

PART 1 General

1.1 RELATED REQUIREMENTS

.1 Section 06 20 00 Finish Carpentry

1.2 REFERENCES

.1 ASTM International

- .1 ASTM A123/A123M-15, Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products.
- .2 ASTM A153/A153M-16 Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware.
- .3 ASTM A653/A653M-15e1, Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvanealed) by the Hot-Dip Process.
- .4 ASTM D1761-12, Standard Test Methods for Mechanical Fasteners in Wood.
- .5 ASTM D5055-13e1, Standard Specification for Establishing and Monitoring Structural Capacities of Prefabricated Wood I-Joists.
- .6 ASTM D5456-14b, Standard Specification for Evaluation of Structural Composite Lumber Products.

.2 Canadian General Standards Board (CGSB)

- .1 CAN/CGSB-11.3-[M87], Hardboard.
- .2 CAN/CGSB-71.26-[M88], Adhesive for Field-Gluing Plywood to Lumber Framing for Floor Systems.

.3 CSA International

- .1 CSA B111-1974(R2003), Wire Nails, Spikes and Staples.
- .2 CSA O86 Consolidation-14, Engineering Design in Wood.
- .3 CSA O112.9-10(R2014), Evaluation of Adhesives for Structural Wood Products (Exterior Exposure).
- .4 CSA O121-08(R2013), Douglas Fir Plywood.
- .5 CSA O141-05(R2014), Softwood Lumber.
- .6 CSA O151-09(R2014), Canadian Softwood Plywood.
- .7 CSA O325-07(R2012), Construction Sheathing.
- .8 CSA O437 Series-93(R2011), Standards on OSB and Waferboard.

.4 Forest Stewardship Council (FSC)

- .1 FSC-STD-01-001-(version 4-0), FSC Principle and Criteria for Forest Stewardship.

.5 National Lumber Grades Authority (NLGA)

- .1 Standard Grading Rules for Canadian Lumber 2014.

.6 South Coast Air Quality Management District (SCAQMD), California State, Regulation XI. Source Specific Standards

.1 SCAQMD Rule 1113-[A2011], Architectural Coatings.

.2 SCAQMD Rule 1168-[A2005], Adhesives and Sealants Applications.

1.3 ACTION AND INFORMATIONAL SUBMITTALS

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

.2 Product Data:

.1 Submit manufacturer's instructions, printed product literature and data sheets for wood products and accessories and include product characteristics, performance criteria, physical size, finish and limitations.

1.4 QUALITY ASSURANCE

.1 Lumber by grade stamp of an agency certified by Canadian Lumber Standards Accreditation Board.

.2 Plywood, particleboard, OSB and wood based composite panels in accordance with CSA and ANSI standards.

.3 Sustainable Standards Certification:

.1 Certified Wood: submit listing of wood products and materials used in accordance with CAN/CSA-Z809 or FSC or SFI.

1.5 DELIVERY, STORAGE AND HANDLING

.1 Deliver, store and handle materials in accordance with Section 01 61 00 - Common Product Requirements.

.2 Delivery and Acceptance Requirements: deliver materials to site in original factory packaging, labelled with manufacturer's name and address.

.3 Storage and Handling Requirements:

.1 Store materials off ground in dry location and in accordance with manufacturer's recommendations in clean, dry, well-ventilated area.

.2 Store and protect [wood] from [nicks, scratches, and blemishes].

.3 Replace defective or damaged materials with new.

.4 Packaging Waste Management: remove for reuse as specified in Construction Waste Management Plan and Waste Reduction Workplan in accordance with Section 01 74 19 - Construction/Demolition Waste Management and Disposal.

1.6 COORDINATION AND COOPERATION

.1 Cut, trim, drill, frame and make good rough carpentry work for passage of work of other sections except where otherwise specified.

.1 Provide location, centering and bracketing for all trades and wood framing for plumbing, heating, electrical and other trades. Make good all defects and fully complete the rough carpentry.

.2 Provide solid backing where required for mounting accessories, including grab bars.

PART 2 Products

2.1 FRAMING, STRUCTURAL AND PANEL MATERIALS

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

.1 CSA O141.

.2 NLGA Standard Grading Rules for Canadian Lumber.

.2 Glued end-jointed (finger-jointed) lumber [NLGA Special Products Standard] SPS, are not acceptable for exterior wall and shear wall framing.

.3 Framing and board lumber: in accordance with National Building Code of Canada (NBCC) and CSA O86.

.4 Furring, blocking, nailing strips, grounds, rough bucks, cants, curbs, fascia backing and sleepers:

.1 Board sizes: "Standard" or better grade.

.2 Dimension sizes: "Standard" light framing or better grade.

.5 Plywood, OSB and wood based composite panels: to CSA O325.

.6 Canadian softwood plywood (CSP): to CSA O151, standard construction.

2.2 ACCESSORIES

.1 Air seal: closed cell polyurethane or polyethylene.

.2 Sealants: in accordance with Section 07 92 00 - Joint Sealants.

.1 Sealants: VOC limit 250 g/L maximum to SCAQMD Rule 1168.

.3 Subflooring adhesive: to CAN/CGSB-71.26, cartridge loaded.

.4 General purpose adhesive: to CSA O112.9.

.5 Nails, spikes and staples: to CSA B111.

.6 Bolts: 12.5 mm diameter unless indicated otherwise, complete with nuts and washers.

.7 Self tapping screws: Stainless steel, countersink head, of appropriate length.

.8 Proprietary fasteners: toggle bolts, expansion shields and lag bolts, screws and lead or inorganic fibre plugs, explosive actuated fastening devices, recommended for purpose by manufacturer.

.9 Fastener Finishes:

.1 Galvanizing: to ASTM A153/A153M, use galvanized fasteners for exterior work, and interior highly humid areas

PART 3 Execution

3.1 EXAMINATION

.1 Verification of Conditions: verify conditions of substrates previously installed under other Sections or Contracts are acceptable for product installation in accordance with manufacturer's written instructions.

- .1 Visually inspect substrate.
- .2 Inform Departmental Representative of unacceptable conditions immediately upon discovery.
- .3 Proceed with installation only after unacceptable conditions have been remedied.

3.2 MATERIAL USAGE

.1 Floor sheathing:

- .1 Plywood, DFP, select sheathing grade, square edge, 19 mm thick.

.2 Subfloor:

- .1 Plywood, DFP, G1S square edge, 8mm thick

.3 Electrical equipment mounting boards:

- .1 Plywood, DFP G1S grade, or, square edge 19 mm thick.

3.3 INSTALLATION

.1 Install floor sheathing as indicated, at right angles to insulated floor panels. Attach into top skin of floor panels with #8 x38mm PHF TEK screws set flush with top of plywood. Screws to be spaced approximately

.2 Attach subfloor to floor sheathing using adhesive and staples as indicated.

.3 Install rough bucks, nailers and linings to rough openings as required to provide backing for windows, door frames and other work.

.4 Install wood cants, fascia backing, nailers, curbs and other wood supports as required and secure using galvanized steel fasteners.

.5 Frame, anchor, fasten, tie and brace members to provide necessary strength and rigidity.

.6 Countersink bolts where necessary to provide clearance for other work.

3.4 FURRING AND BLOCKING

.1 Co-ordinate and Install proper furring and solid blocking as shown on the drawings and as specified to space-out and/or support:

- .1 Anchoring and mounting cabinets
- .2 Hardware
- .3 Electrical equipment

.4 Fittings and fixtures not supplied with backing attachments

.5 Washroom accessories

.6 All grab bars as per layout specified in Architect's detail drawings.

3.5 CLEANING

.1 Progress Cleaning: clean in accordance with Section 01 74 11 - Cleaning.

.1 Leave Work area clean at end of each day.

.2 Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment in accordance with Section 01 74 11 - Cleaning.

.3 Waste Management: separate waste materials for recycling in accordance with Section 01 74 19 - Construction/Demolition Waste Management and Disposal

.1 Remove recycling containers and bins from site and dispose of materials at appropriate facility.

3.6 PROTECTION

.1 Protect installed products and components from damage during construction.

.2 Repair damage to adjacent materials caused by rough carpentry installation.

END OF SECTION

Part 1 General

1.1 SECTION INCLUDES

.1 Custom shop fabricated locker unit.

.2 Millwork cabinets and shelves.

.3 Countertops.

.4 Cabinet hardware.

.5 Interior window trim

1.2 RELATED SECTIONS

.1 Section 06 20 00 - Finish Carpentry

.2 Section 09 91 23 - Interior Painting.

1.3 REFERENCES

.1 BHMA A156.9-2010 - Cabinet Hardware.

.2 NPA A208.2-2009 - Medium Density Fibreboard (MDF) for Interior Applications.

.3 AWMAC - Architectural Woodwork Standards (AWS) – 1st Edition, 2009.

.4 CAN/CSA O141-91(R1999), Softwood Lumber.

.5 NEMA LD3-2005 - High Pressure Decorative Laminates (HPDL).

.6 Green Seal Environmental Standards

- .1 Standard GC-03-97, Anti-Corrosive Paints.
- .2 Standard GS-11-93, Architectural Paints.
- .3 Standard GS-36-00, Commercial Adhesives

.7 South Coast Air Quality Management District (SCAQMD), California State

- .1 SCAQMD Rule 1113-04, Architectural Coatings.
- .2 SCAQMD Rule 1168-05, Adhesives and Sealants Applications

.8 EN 438-2:25 - Standard Test Method for Resistance to Scratch.

.9 EN 438-2:16 - Standard Test Method for Resistance to Dry Heat.

.10 EN 12721 - Standard Test Method for Resistance to Wet Heat

.11 EN 438-2:17 - Standard Test Method for Dimensional Stability in Elevated Temperature.

.12 EN ISO 178/ASTM 790-08 - Standard Test Method for Flexural Strength

.13 EN ISO 1183/ASTM 792-08 - Standard Test Method for Density

.14 ASTM E-84/UL 723 - Standard Test Method for Surface Burning Characteristics

1.4 SUBMITTALS

.1 Section 01 33 00: Submission procedures.

.2 Shop Drawings: Indicate materials, component profiles and elevations, assembly methods, joint details, fastening methods, accessory listings, hardware location and schedule of finishes.

.3 Product Data: Provide data for hardware accessories.

.4 Provide samples of solid surface and plastic laminate materials for selection by Departmental Representative.

.1 Provide samples from manufacturers standard colour range.

1.5 QUALITY ASSURANCE

.1 Perform cabinet construction to AWMAC Custom quality.

1.6 DELIVERY, STORAGE, AND PROTECTION

.1 Deliver, store and handle materials in accordance with manufacturers recommendations..

1.7 ENVIRONMENTAL REQUIREMENTS

.1 During and after installation of work of this section, maintain the same temperature and humidity conditions in building spaces as will occur after occupancy.

Part 2 Products

2.1 LUMBER MATERIALS

.1 Lumber: To the requirements of AWMAC, Custom grade.

.2 Hardwood Lumber: plain sawn, maximum moisture content of 6%; with plain sawn grain, of quality suitable for transparent finish.

2.2 SHEET MATERIALS

.1 Sheet Materials: To the requirements of AWMAC custom grade.

.2 Softwood Plywood: Veneer core; Douglas of grade to suit application; sanded faces.

.1 Plywood resin to include no added urea formaldehyde

.3 Maple plywood: 7-ply all hardwood veneer core plywood with no voids, to AWMAC/AWI Custom Grade requirements, no added urea-formaldehyde.

.1 Top veneers (facers): White Maple, plain-sliced/flat-cut, 'A Grade' to AWS Manual 4.2a.16.2 requirements and selected for uniform consistent colour across face.

2.3 STANDING AND RUNNING TRIM MATERIALS

.1 19mm x 89mm kiln dried finger joint pine, pre primed. To CAN/CSA O141-91.

2.4 LAMINATE MATERIALS

.1 High Pressure Laminate: NEMA LD3, high pressure laminate, solid chosen from manufacturers standard colour range, satin finish.

2.5 SOLID SURFACE COUNTERTOP MATERIALS

1. Solid phenolic composite; chemical resistant surface; composed of a self-supporting flat panel based on thermosetting resins, homogeneously reinforced with cellulose fibers and manufactured under high pressure. The panels have a pigmented resin core with a decorative surface that is electron-beam cured.

.1 Solid phenolic composite material comprised mounted to plywood substrate.

.1 Composition: 25mm thick built up.

.2 Outside corners: radius

.3 Submittals:

.1 Show field-verified dimensions, surfacing dimensions, locations and dimensions of cutouts, required locations of support and blocking members, edge profiles, and installation details and methods. Identify colour(s) and finish(es).

.2 Samples for Colour and edge treatment approval: Submit two (2) samples 10 x 10 inches (250 x 250 mm) of colour and finish selected.

.3 Stone Adhesive: Submit two (2) samples of an adhesive joint for colour quartz surfacing selected. Show colour match of adhesive.

2.6 ACCESSORIES

.1 Adhesive: Type recommended by laminate and phenolic solid surface material manufacturer to suit application.

.1 Adhesives to SCAQMD Rule 1168-05

.2 Plastic Edge Trim (PVC): Extruded flat shaped; smooth finish; self locking serrated tongue; of width to match component thickness; colour as selected. Minimum 3 mm thickness.

2.7 HARDWARE

.1 Hardware: BHMA A156.9

.2 Shelf Standards and Rests: Formed steel channels and rests, cut for fitted rests spaced at 25 mm centres; satin finish.

.3 Shelf Brackets: Formed steel brackets, formed for attachment with lugs; satin finish.

.4 Drawer and Door Pulls: Extruded aluminum pull, U-shaped satin finish; 100 mm centres.

.5 Cabinet and Locker Locks: Keyed cylinder, two keys per lock, master keyed.

.6 Cabinet Catches: Magnetic.

.7 Drawer Slides: Galvanized steel construction, ball bearings separating tracks, full extension type.

.8 Hinges: European type, satin finish.

.9 Piano hinges: 19mm butt, stainless steel construction. Satin finish, lengths as detailed

.10 Hanging rods:

.1 Rods: chrome plated 25 mm o.d x minimum 1.9 mm wall thickness seamless steel tubing.

.2 Flanges: chrome plated steel round "captured" flanges to prevent unauthorized rod removal, complete with chromed plated mounting screws.

.3 Intermediate supports required when rod exceeds 1m length

2.8 PLASTIC LAMINATE CASEWORK

.1 Cabinet Construction: Flush overlay, adjustable shelving plywood core.

.2 Exposed Surfaces:

.1 Drawers and Drawer Fronts: High pressure laminate.

.2 Edges: PVC.

.3 Semi-exposed Surfaces:

.1 Surfaces (other than drawer bodies) Thermofused melamine.

.2 Shelves: High pressure laminate.

.3 Edges: PVC.

.4 Drawer Sides and Backs: Edgebanded.

.5 Drawer Bottoms: Melamine.

2.9 VENEER PLYWOOD CASEWORK

.1 Plywood materials as detailed

.2 Solid wood edging to AWMAC - Architectural Woodwork Standards (AWS) – 1st Edition, 2009, Custom grade.

2.10 FABRICATION

.1 Shop prepare and identify components for matching during site assembly.

.2 Shop assemble casework for delivery to site in units easily handled and to permit passage through building openings.

.3 When necessary to cut and fit on site, provide materials with ample allowance for site cutting and scribing.

.4 Apply plastic laminate finish in full, uninterrupted sheets consistent with manufactured sizes. Fit corners and joints hairline; secure with concealed fasteners. Slightly bevel arises.

.5 Fabricate solid surface countertops with integral backsplash and front and side edging as detailed. Pre-cut for sink openings.

2.11 WOOD FINISHES

.1 Factory Finishing:

.1 Finishing System: AWMAC, Custom grade, acrylic lacquer finish system.

.2 Sheen: Satin.

Part 3 Execution

3.1 INSTALLATION

.1 Install Work to AWMAC Custom Grade.

.2 Set and secure casework in place; rigid, plumb, and level.

.3 Use fixture attachments in concealed locations for wall mounted components.

.4 Use concealed joint fasteners to align and secure adjoining counter tops.

.5 Secure cabinet to floor using appropriate angles and anchorages.

3.2 INTERIOR STANDING / RUNNING TRIM

.1 Install in accordance with details and to AWMAC/AWI Custom Grade requirements unless more stringent requirements are specified in this Section.

.2 Job site conditions for installation to be in accordance with AWS Manual requirements at time of installation.

.3 Install items in accordance with details using finishing nails throughout.

.4 Countersink all fixings and fill flush with wood filler.

.5 Site measure, cut and install items using longest practical length pieces to avoid splice joints.

.6 Use one length per location to avoid splice joints.

.7 Caulk junctions between standing/running trim and adjacent walls with sealant make junctions filled and smooth for "painting out".

.8 Co-ordinate application of 1st coat of finishes prior to installation.

3.3 ADJUSTING

.1 Test installed work for rigidity and ability to support loads.

.2 Adjust moving or operating parts to function smoothly and correctly.

3.4 CLEANING

.1 Do cleaning in accordance with Section 01 74 11 - Cleaning.

END OF SECTION

Part 1 General

1.1 SECTION INCLUDES

.1 Self-adhesive sheet membrane for isolating dissimilar materials.

.2 Self-adhesive sheet membrane for use in window and door installation.

1.2 RELATED SECTIONS

.1 Section 05 31 00 Steel Decking.

.2 Section 08 11 00 Metal Doors and Frames

.3 Section 08 53 13 Vinyl Windows

1.3 REFERENCES

.1 Canadian General Standards Board (CGSB).

.1 CAN/CGSB 37-GP-56M, Standard for Modified Bituminous Sheet Membranes.

.2 ASTM C1193 - Standard Guide for Use of Joint Sealants.

.3 ASTM E96 - Test Methods for Water Vapour Transmission of Materials.

1.4 SUBMITTALS

.1 Section 01 33 00: Submission procedures.

.2 Product Data: Provide data indicating material characteristics, performance criteria and limitations.

.3 Manufacturer's Installation Instructions: Indicate preparation and installation requirements, techniques.

1.5 WHMIS

.1 Comply with WHMIS requirements when handing and using sealant materials.

Part 2 Products

2.1 SELF ADHESIVE MEMBRANE

.1 Modified Bituminous Membrane: Asphalt and polymer modifiers of styrene-butadiene-styrene (SBS) type, reinforced with non-woven cross laminated polyethylene; smooth surfaced; .8 mm thick; 920 mm wide roll. To CAN/CGSB 37-GP-56M

□

2.2 ACCESSORIES

.1 Primer: Water based surface conditioner as recommended by self adhesive membrane manufacturer.

Part 3 Execution

3.1 EXAMINATION

.1 Verify condition of substrate and adjacent materials.

3.2 PREPARATION

.1 Remove loose or foreign matter which might impair adhesion.

.2 Verify substrate surface is flat, free of honeycomb, fins, irregularities, materials or substances that may impede installation.

3.3 SELF ADHESIVE MEMBRANE

.1 Apply membrane at intersection of dissimilar materials as detailed.

.1 Apply where steel decking meets aluminum floor beams

.2 Apply membrane at door and window installations as detailed.

.3 Apply primer at a rate recommended by the materials manufacturer. Protect surface conditioner from rain or frost until dry.

.4 Roll out membrane. Minimize wrinkles and bubbles.

.5 Remove release paper layer. Roll out on substrate with a mechanical roller to encourage full contact bond.

END OF SECTION

□

Part 1 General

1.1 APPLICATION OF SECTION

.1 Insulated panels are to be provided by owner and installed by contractor.

.2 Information in this section related to panel composition is for Contractor information.

.3 Information in this section related to delivery and installation of panels is applicable to Contractors work.

1.2 RELATED SECTIONS

.1 Section 05 14 11 - Structural Aluminum Assembly.

.2 Section 07 92 00 – Joint Sealing.

.3 Section 08 11 00 - Metal Doors and Frames.

.4 Section 08 53 13 - Vinyl Windows

.5 Section 09 90 00 - Painting.

1.3 REFERENCES

.1 ASTM A792/A792M-10 Standard Specification for Sheet Steel, 55% Aluminum-Zinc Alloy-Coated by the Hot Dip Process

.2 ASTM A775: Standard specification for Sheet Steel, Metallic Coated by the Hot Dip Process and Prepainted by the Coil Coating Process for Exterior Exposed Building Products.

.3 ASTM D1621:D Standard Test Method for Compressive Properties of Rigid Cellular Plastics.

.4 ASTM E72; Standard Test Methods of Conducting Strength Tests of Panels for Building Construction

.5 ASTM E84; Standard Test Method for Surface Burning Characteristics of Building Materials

.6 ASTM E283; Standard Test Method for Determining Rate of Air Leakage Through Exterior Windows, Curtain Walls, and Doors Under Specified Pressure Differences Across the Specimen

.7 ASTM E331; Standard Test Method for Water Penetration of Exterior Windows, Skylights, Doors, and Curtain Walls by Uniform Static Air Pressure Difference

.8 ASTM E1646; Standard Test Method for Water Penetration of Exterior Metal Roof Panel Systems by Uniform Static Air Pressure Difference

.9 ASTM E1680; Standard Test Method for Rate of Air Leakage Through Exterior Metal Roof Panel Systems

.10 UL 580; Tests for Uplift Resistance of Roof Assemblies

.11 FM 4471; Approval Standard for Class 1 Panel Roofs

1.4 SUBMITTALS

.1 The following submittals will be provided by the owner & panel manufacturer for contractor use.

.2 Shop Drawings: detailed drawings and panel analysis showing:

.1 Profile

.2 Gauge of both exterior and interior sheet

.3 Location, layout and dimensions of panels on structure

.4 Location and type of fasteners

.5 Shape and method of attachment of all trim

.6 Locations and type of sealants

.7 Coordination Drawings: elevation drawings and building sections which show panels in relationship to required locations for structural support. Include panel details and details showing attachment to structural support.

.8 Snow and Wind Design loads

.1 Engineered per NBC for building location.

.2 Provide drawings and calculations under the seal of a Structural Engineer registered in the Province of British Columbia.

.9 Other details as may be required for a weathertight installation

.3 Roof Panel Analysis: panel calculations to indicate compliance with max deflection of L/240 for the indicated design loads. Include effects of thermal differential between the exterior and interior panel facings

. 4 Wall Panel Analysis: panel calculations to verify panels will withstand the design wind loads indicated without detrimental effects or deflection exceeding L/180. Include effects of thermal differential between the exterior and interior panel facings and resistance to fastener pullout.

.5 Quality Assurance Submittals

.1 Design Data, Test Reports: Provide manufacturer test reports indicating product compliance with requirements.

.2 Manufacturer Erection Instructions: Provide manufacturer's written installation instructions including proper material storage, material handling, installation sequence, panel location(s), and attachment methods, details and required trim and accessories.

1.5 QUALITY ASSURANCE

.1 Installer Qualifications:

.1 The work shall be supervised by a person having a minimum of five (5) years experience in construction supervision and the application of good trade practice in constructing pre-fabricated building assemblies.

.2 Installation shall be in accordance with manufacturer's installation guidelines and recommendations.

.2 Fire Classifications:

.1 Factory Mutual Class 1A Approval when installed at a maximum roof slope of 5:12.

1.6 DELIVERY STORAGE AND HANDLING

.1 Contractor is responsible for receiving delivery of panels to site and directing storage / staging location. Panels are supplied by:

• Mansonville Plastics, Korolite Engineering Panel Structures ltd. Surry B.C. (604-534-8626)

.2 Materials and components are to arrive on site in manufacturer's original, unopened, undamaged packaging with identification labels intact.

.3 Store roofing, wall and flooring panel materials on dry, level, firm, and clean surface using the three inch factory provide foam supports under the panels. Use of wood substitute is not acceptable. Stack no more than two bundles high. Elevate and ventilate to allow air to circulate and moisture to escape.

1.7 WARRANTY

.1 Limited Warranty: Standard form in which manufacturer agrees to repair or replace items that fail in materials or workmanship within specified warranty period. The items covered by the warranty include structural performance and finish performance.

.1 Warranty Period: Ten (10) years from date of Substantial Completion

.2 Finish Warranty: Standard form in which manufacturer agrees to repair or replace metal panels that evidence deterioration of fluoropolymer finish, including flaking or peeling from approved primed metal substrate, chalk in excess, and /or colour fading.

.1 Warranty Period: Ten (10) years from date of Substantial Completion.

1.8 WASTE MANAGEMENT AND DISPOSAL

.1 In accordance with Section 01 74 19 waste Management and disposal.

.2 Divert unused metal from landfill to metal recycling facility.

.3 Dispose of unused paint material at official hazardous material collections site.

.4 Do not dispose of unused paint material into sewer system, into streams, lakes, onto ground or in other locations where it will pose health or environmental hazard.

Part 2 Products

2.1 STANDING SEAM ROOF AND FLOOR PANELS

.1 Roof and Floor Panel Description

.1 Minimum R Value: R20

.2 Panel width: 42 inch wide

.3 Panel length: full length no seams

.4 The side joint shall consist of a 2 inch vertical sidelap, mechanically seamed, with fasteners and thermally broken attachment clip completely concealed within the side joint.

.5 Exterior Face of Panel

.1 Material: AZ150 Galvalume per ASTM A792.

.2 Metal thickness: 24 gauge.

.3 Texture: smooth, embossed

.4 Yield: 33 ksi minimum

.5 Exterior Finish: 1.0 mil Silicone Modified Polyester (SMP)

.1 Roof colour: Coast Guard Red. Submit for approval by Departmental Representative.

.2 Floor colour: Imperial White.

.6 Interior Face of Panel

.1 Material: AZ150 Galvalume per ASTM A792.

.2 Metal thickness: 24 gauge.

.3 Profile: stucco, embossed

.4 Yield: 33 ksi minimum

.5 Interior Finish: 1.0 mil Silicone Modified Polyester (SMP)

.1 Colour: Imperial White

.7 Insulating Core:

.1 Consists of expanded polystyrene eps

.2 Panel shall provide a nominal R-value of 4 per inch thickness.

.3 Compressive Strength: 10psi

.4 Flexural Strength: 25 psi

.5 Water Vapour: Permeability: 3.50 perm-in

.6 Water Absorption % by volume: 6.0

.7 Dimensional Stability % linear change: 1.5%(max)

2.2 WALL PANELS

.1 Wall Panel Description

.1 Minimum R Value: R-24

.2 Metal thickness: 24 gauge.

.3 Panel Attachment: Shall consist of fasteners and stainless steel attachment clip completely concealed within the panel side joint.

.4 Exterior Face of Panel

.1 Material:

.1 Steel coil material shall be in accordance with ASTM A755: AZ150 Galvalume in accordance with ASTM A792.

.2 Profile : embossed

.3 Texture: Non Directional stucco

.4 Exterior paint Finish Colour:

.1 TBD

.2 Finish System

.1 1.0 mil Silicone modified Polyester (SMP)

.5 Interior Face of Panel

.1 Material

.1 Steel coil material shall be in accordance with ASTM A755: AZ150 Galvalume in accordance with ASTM A792. .

.2 Metal thickness: 24 gauge.

.3 Profile: embossed

.4 Texture: non-directional stucco

.5 Interior Finish: 1.0 mil Silicone Modified Polyester (SMP)

.1 Colour: TBD

2.3 PANEL CHARACTERISTICS (ROOF, WALL AND FLOOR PANELS)

.1 Physical Characteristics

.1 Structural Test: Design shall be verified by representative structural test for wind loads in accordance with ASTM E72. The deflection criteria shall be L/240 for roof panels and l/180 for wall panels.

.2 Thermal Properties: The panel shall provide a nominal R-value of 4 per inch thickness when tested in accordance with ASTM C518 at a mean temperature of 75 deg. F.

.3 Fatigue Test: There shall be no evidence of metal/insulation interface delamination when the panel is tested by simulated wind loads of 20 psf (positive and negative loads), when applied for two million alternate cycles.

.4 Bond Strength: No metal primer interface corrosion and/or delamination shall occur after 1000 hours at 140 deg. F and 100 percent relative humidity. No delamination shall occur after 2-1/2 hours in a 2 psi 212 deg. F autoclave.

.5 Water Penetration: There shall be no uncontrolled water leakage at pressures of up to 137 pa when tested in accordance with ASTM E331 and ASTM E1646. Tested assembly must include endlap and sidelap conditions.

.6 Air Infiltration: Air infiltration through the roof shall not exceed 0.003 cfm/sf at 6300 pa air pressure differential when tested in accordance with ASTM E283 and ASTM E1680. Tested assembly must include endlap and sidelap conditions.

.7 Hailstorm Rating: Factory Mutual 1 SH hailstorm rating.

.2 Finish Characteristics

.1 Film Thickness: The exposed surface shall have a dry film thickness of 0.1 mils. Test Method: ASTM D5796

.2 Film Cure: The baked film shall withstand one hundred and fifty (150) MEK double rubs. Test Method: ASTM D5402

.3 Film Hardness (Pencil Method): The hardness of the paint film may be measured by means of Eagle/Berol turquoise T-2375 or equivalent pencils using a flat cylindrical head applied at a 45deg. angle to the paint film. A minimum hardness of F shall be obtained. Pencil Hardness is specified as the hardest pencil number that will not rupture the paint film when tested as described above. Test Method: ASTM D3363

.4 Formability/Adhesion Test: When testing a representative sample at 20oC } 1oC and using #610 Scotch cellophane tape, the paint system will show no loss of adhesion when subjected to a 3T 180deg. bend and tape pull test. Test Method: ASTM D4145.

.5 Gloss: The specular gloss shall be 30 ± 5 gloss units when measured with a Gardner 60o Glossmeter.

.6 Humidity Resistance: The humidity resistance test shall be conducted at 100% relative humidity at a temperature of 38oC. After 1000 hours of exposure, the surface shall show no field blisters. Test Method: ASTM D2247

.7 Film Integrity: During the first forty (40) years of exposure, the paint film shall have no evidence of cracking, flaking, or checking to an extent that is apparent on ordinary outdoor visual observations.

.8 Chalking: For the first thirty (30) years, vertical installations will not chalk more than a #8 rating and non-vertical installations will not chalk more than #6 when measured per ASTM D4214, Method A.

.9 Colour Change: For the first thirty (30) years, vertical installations will not change colour more than five (5) and non-vertical installations will not change more than eight (8) delta E colour units.

2.4 ACCESSORIES

.1 Fasteners

.1 Self-drilling fasteners shall be cadmium plated steel, designed to resist maximum negative pulloff loads and hold the face sheet mechanically to the structural support.

.2 Panel attachment clip shall be two pieces and fully concealed within the panel side joint. Base clip shall be a minimum 14 gauge galvanized, and top clip shall be a minimum 20 gauge stainless steel with an integral thermal break.

.3 Vibration resistant type (anti-backout threads) fasteners. Self-drilling flathead screws with sealing washers and square drives, designed to resist back out by increasing thread friction as screw loosens.

.2 Perimeter Trim and Penetration Treatments

.1 As provided by the panel manufacturers as a complete package with the panel system.

.2 All required trim and metal flashing with same coating, colour, and gauge as the exterior face of the insulated metal roof panel.

.3 Butyl Tape: Per panel manufacturer's recommendations for panel to panel and panel to trim seal.

.4 Butyl Sealants: Non-skinning type per panels manufacturer's recommendations.

Part 3 Execution

3.1 EXAMINATION

.1 Examine alignment of the structure and supports prior to installing the insulated metal roof panels.

.1 Structure Tolerance: In the plane of the roof 0 inches inward, plus 13mm outward

.2 All deviations from structural tolerances shall be corrected by the responsible party prior to installation of the panels.

.2 Examine individual panels upon removing from the bundle; both edges should be visually examined and any slight overfill of insulation should be carefully removed.

3.2 PANEL INSTALLATION

.1 Assembly instructions for panel system to be provided by the panel manufacturer with the shop drawings.

.2 Cut panels, where indicated on shop drawings, using a power circular saw with fine tooth carbide tip blades or a band saw prior to installation. Ventilate area where polyurethane dust is generated. Personnel should wear respiratory and eye protection devices.

.3 Apply butyl sealant vapour seal around interior perimeter of roof assembly per panel manufacturer's instructions.

.4 Apply butyl tape on panel sidelaps and clip assemblies per panel manufacturer's instructions.

.5 Secure units to the steel supports with manufacturer's recommended fastener.

.6 Place panel fasteners through predrilled top clip and base clip, concealed within the side joint of the panel.

.1 Heads of concealed fasteners shall be insulated from the exterior environment to prevent condensation and "ice balling" from occurring on the fastener shaft.

.7 Apply endlap sealing tape and butyl to panel surface to be lapped per manufacturer's instructions.

.8 Endlap panel stitch fasteners to be vibration resistant type.

.9 As each panel is installed, crimp hidden clip assembly prior to placement of next panel.

.10 Repair or replace metal panels and trim that have been damaged.

3.3 TRIM INSTALLATION

.1 Place trim to determine the location of the closure strips, sealant and ridge closure trims.

.2 Apply butyl tape above and below the foam closure strip and seat the closure strip firmly in the tape to ensure a continuous seal. If any voids exist add butyl caulking and reseat the closure.

.3 Place a continuous layer of butyl tape on top of the metal ridge closure trims for the length of the building.

.4 Fasten the exterior ridge trim to the metal ridge closure trims, per manufacturer's recommendations, on center with 1/4 inch by 7/8 inch low profile vibration resistant stitch fasteners.

3.4 CLEANING

.1 Do cleaning in accordance with Section 01 74 11 - Cleaning.

.2 Progress Cleaning:

.1 Remove dirt and marks caused by installation.

.3 Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment.

.4 Waste Management: separate waste materials for recycling.

.1 Remove recycling containers and bins from site and dispose of materials at appropriate facility.

END OF SECTION

Part 1 General

1.1 RELATED SECTIONS

.1 Section 08 11 00 - Metal Doors and Frames

.2 Section 08 53 13 – Vinyl Windows

1.2 REFERENCES

.1 American Society for Testing and Materials International (ASTM)

.1 ASTM A240/A240M-07e1, Standard Specification for Chromium and Chromium-Nickel Stainless Steel Plate, Sheet, and Strip for Pressure Vessels and for General Applications.

.2 ASTM A653/A653M-07, Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.

.3 ASTM B32-04, Standard Specification for Solder Metal.

.4 ASTM D523-89(1999), Standard Test Method for Specular Gloss.

.5 ASTM D822-01(2006), Standard Practice for Filtered Open-Flame Carbon-Arc Exposures of Paint and Related Coatings.

.6 ASTM C920-08, Standard Specification for Elastomeric Joint Sealants.

.2 Aluminum Association (AA)

.1 AA DAF 45-03(R2009), Designation System for Aluminum Finishes.

.3 American Architectural Manufacturers Association (AAMA)

.1 AAMA 611-98, Voluntary Specifications for Anodized Finishes Architectural Aluminum.

.4 NBC, National Building Code of Canada (issue date listed in Section 01 41 00 Regulatory Requirements)

.5 Health Canada/Workplace Hazardous Materials Information System (WHMIS)

.1 Material Safety Data Sheets (MSDS).

1.3 SUBMITTALS

.1 Provide submittals in accordance with Section 01 33 00 - Submittal Procedures.

.2 Product Data:

.1 Submit manufacturer's printed product literature for sheet metal flashing systems materials, specifications and datasheet and include product characteristics, performance criteria, physical size, finish and limitations.

.3 Samples:

.1 Submit duplicate samples of each type of sheet metal material, finishes and colours for Departmental Representative color selection.

1.4 PERFORMANCE REQUIREMENTS

.1 Provide metal flashings that will withstand wind uplift conditions listed in NBC for building location, unless more stringent values are identified on drawings.

1.5 DELIVERY, STORAGE AND HANDLING

.1 Deliver, store and handle materials in accordance with manufacturers recommendations.

.2 Protect pre finished materials from scratching

.3 Stack pre-formed materials in manner to prevent twisting, bending and rubbing.

1.6 WASTE MANAGEMENT AND DISPOSAL:

.1 Separate waste materials for recycling in accordance with Section 01 74 19 - Construction/Demolition Waste Management and Disposal.

Part 2 Products

2.1 MATERIALS

.1 Zinc coated sheet steel: to ASTM A653/A653M, commercial quality, Grade 33, with not less than Z275 designation zinc coating, pre-finished.

.1 Pre-finish: coil stock finished with polyvinylidene fluoride gloss paint on epoxy primer prior to profile fabrication, with colour coat containing not less than 70% pvdf resin. Include permanent-type treatment to reverse side of coil stock to prevent corrosion of backside surfaces.

.1 Specular gloss: 30 units +/- in accordance with ASTM D523.

.2 Coating thickness: not less than 22 micrometres

.3 Resistance to accelerated weathering for chalk rating of 8, colour fade 5units or less and erosion rate less than 20% to ASTM D822 as follows:

.1 Outdoor exposure period 2500 hou

.2 Humidity resistance exposure period 5000 hours

.4 Colours: As selected by Departmental Representative.

.2 Sheet steel to be produced by North American mills to ensure compliance with above-referenced standards. Submit evidence of North American mill source upon Departmental Representative request.

.2 Touch-up paint: type compatible with and matching pre-finish paint/colour.

.3 Flashing fasteners: #8-18x19mm, self-tapping screws

.4 Sealants: non-sag polyurethane, one part formulation, to ASTM C 920 Type S, Grade NS, Class 35, Use NT, M, A and O; colours selected by DCC Representative where exposed to view.

.5 Self-adhesive SBS membrane: minimum 1 mm thick self-adhering composite sheet membrane comprised of 0.8 mm thick rubberized asphalt integrally bonded to 0.1 mm thick film of polyethylene, bottom surface protected with silicone release sheet.

2.2 FABRICATION OF FLASHING

.1 Fabricate in accordance with detail drawings.

.2 Fabricate typical flashings using not less than 0.61 mm thick pre-finished zinc coated sheet steel, unless detailed/indicated otherwise. Use greater metal thickness at locations of wider span to prevent "oil-canning" and deformation of flashings.

.3 Fabricate flashings accurately with true crisp lines and quality metalwork joinery suitable for exposed installation.

.4 Pre-fabricate corners with mitred joints. Form watertight lock-seams set in sealant for all mitred corner joints.

.5 Maintain 1:6 minimum slope on horizontal surfaces.

.6 Hem exposed edges. Fold under minimum 10 mm.

.7 Form sections square, true and accurate to size, free from distortion and other defects detrimental to appearance or performance.

.8 Refer to drawings for self-adhesive SBS membrane locations under metal flashings.

.9 Fabricate specialized flashings including but not limited to hot pipe flashings, storm collars, pressure rings and flue caps using not less than 0.38 mm (AISI 28 gauge) metal thickness stainless steel sheet. Use greater metal thickness at locations of wider span to prevent "oil-canning" and deformation of flashings.

.1 Colour match welding material to parent metal in stainless steel fabrications.

.2 Use welding material with same corrosion resistance properties as parent metal.

.3 Grind and polish welds to match parent metal.

2.3 FABRICATION OF WINDOW FLASHINGS

.1 Fabricate in straight sections as indicated.

2.4 GUTTERS

.1 .1 Material: ASTM B209M utility sheet aluminum, shop pre-coated with high molecular weight polyester (hmp) gloss paint on epoxy primer prior to profile fabrication, colours selected by Departmental Representative.

.2 Components:

.1 Gutters: 125 mm size rectangular profile, not less than 0.80 mm metal thickness.

.2 Downspouts: 75 mm o.d. round profile, not less than 0.48 mm metal thickness.

.3 End caps, downspout outlets, straps, support brackets, downspout strainers: profiled to suit gutters and downspouts.

.3 Accessories:

.1 Anchorage devices: stainless steel alloy screws and washers.

.2 Gutter supports: designed to fit into, engage and support gutters; non-corroding plated finish stamped metal or aluminum alloy casting fabrications.

.3 Downspout supports: straps.

.4 Downspout adapters: ABS plastic units sized to downspouts and to drain pipes, offset and straight designs, colours selected by Departmental Representative.

.4 Fabrication:

.1 Form gutters and downspouts of profiles and sizes detailed/indicated.

.2 Form sections square, true and accurate in size, in maximum possible lengths and free of distortion or defects detrimental to appearance or performance.

Part 3 Execution

3.1 INSTALLATION

.1 Metal Flashings

.1 Install in accordance with detail drawings.

.2 Fit flashings together so that one end of each section is free to move in joint.

.3 Fit flashings secure in place. Make corners square, surfaces true and straight in all planes, and all lines accurate to profiles.

.2 Gutters and downspouts

.1 Install in accordance with detail drawings.

3.2 CLEANING

.1 Do cleaning in accordance with Section 01 74 11 - Cleaning.

.2 Clean flashings to remove handling marks and smudges.

.3 Progress cleaning: leave Work area clean at end of each day.

.4 Final cleaning: on completion and verification of performance of installation, remove surplus materials, excess materials, rubbish, tools, equipment and barriers.

END OF SECTION

Part 1 General

1.1 RELATED REQUIREMENTS

.1 Section 07 41 16 - Pre-Fabricated Wall and Roof Panels

.2 Section 07 44 56 - Mineral Fiber Reinforced Cementitious Panels

.3 Section 07 62 00 Sheet Metal Flashing and Trim

.4 Section 09 91 00 Painting

1.2 REFERENCES

.1 ASTM International

.1 ASTM C919-08, Standard Practice for Use of Sealants in Acoustical Applications.

.2 Canadian General Standards Board (CGSB)

.1 CGSB 19-GP-5M-1984, Sealing Compound, One Component, Acrylic Base, Solvent Curing (Issue of 1976 reaffirmed, incorporating Amendment No. 1).

.2 CAN/CGSB-19.13- M87, Sealing Compound, One-component, Elastomeric, Chemical Curing.

.3 CAN/CGSB-19.17-M90, One-Component Acrylic Emulsion Base Sealing Compound.

.4 CAN/CGSB-19.24-M90, Multi-component, Chemical Curing Sealing Compound.

.3 General Services Administration (GSA) - Federal Specifications (FS)

.1 FS-SS-S-200-E(2)1993, Sealants, Joint, Two-Component, Jet-Blast-Resistant, Cold Applied, for Portland Cement Concrete Pavement.

.4 AAMA 809 Voluntary Specifications and Test Methods for Sealants.

.5 Health Canada/Workplace Hazardous Materials Information System (WHMIS)

.1 Material Safety Data Sheets (MSDS).

.6 Green Seal Environmental Standards

.1 Standard GS-36-00, Commercial Adhesives

.7 South Coast Air Quality Management District (SCAQMD), California State, Regulation XI. Source Specific Standards

.1 SCAQMD Rule 1168-A2005, Adhesives and Sealants Applications.

1.3 SUBMITTALS

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

.2 Product Data:

.1 Submit manufacturer's instructions, printed product literature and data sheets for joint sealants and include product characteristics, performance criteria, physical size, finish and limitations.

.2 Manufacturer's product to describe:

.1 Caulking compound.

.2 Primers.

.3 Sealing compound, each type, including compatibility when different sealants are in contact with each other.

.3 Samples:

.1 Submit samples of each type of material and colour.

.2 Cured samples of exposed sealants for each colour where required to match adjacent material.

.4 Manufacturer's Instructions:

.1 Submit instructions to include installation instructions for each product used.

1.4 DELIVERY, STORAGE AND HANDLING

.1 Deliver, store and handle materials in accordance with manufacturers recommendations.

.2 Delivery and Acceptance Requirements: deliver materials to site in original factory packaging, labelled with manufacturer's name and address.

.3 Storage and Handling Requirements:

.1 Store materials accordance with manufacturer's recommendations in clean, dry, well-ventilated area.

1.5 WHMIS

.1 Submit copies of Workplace Hazardous Materials Information System (WHMIS) Material Safety Data Sheets (MSDS) in accordance with Section 01 33 00 - Submittal Procedures. Indicate VOCs during application.

1.6 WASTE MANAGEMENT AND DISPOSAL

.1 Separate and recycle waste materials in accordance with Section 01 74 19 - Construction/Demolition Waste Management and Disposal.

1.7 SITE CONDITIONS

.1 Environmental Conditions:

.1 Proceed with installation of joint sealants only when:

.1 Ambient and substrate temperature conditions are within limits permitted by joint sealant manufacturer or are above 4.4 degrees C.

.2 Joint substrates are dry.

.3 Conform to manufacturer's recommended temperatures, relative humidity, and substrate moisture content for application and curing of sealants including special conditions governing use.

.2 Joint-Width Conditions:

.1 Proceed with installation of joint sealants only where joint widths are more than those allowed by joint sealant manufacturer for applications indicated.

.3 Joint-Substrate Conditions:

.1 Proceed with installation of joint sealants only after contaminants capable of

.4 Where sealants are qualified with primers use only these primers.

Part 2 Products

2.1 SEALANT MATERIALS

.1 Sealant materials to conform to the requirements of :

.1 Green Seal Environmental Standards

.1 Standard GS-36-00, Commercial Adhesives

.2 South Coast Air Quality Management District (SCAQMD), California State

.1 SCAQMD Rule 1168-A2005, Adhesives and Sealants Applications.

.2 VOC limit maximum 250 g/L for sealers used within the building envelope.

.3 Where sealants are qualified with primers, use only these primers

2.2 SEALANT MATERIAL DESIGNATIONS

.1 Polyurethanes: colours selected by Departmental Representative.

.1 Non-sag formulation: 1-part, to CAN/CGSB-19.13, Type 2, MCG-2-25, MCG-2-40.

.2 Self-levelling formulation:

.3 1-part: to CAN/CGSB-19.13, Type 1.

.4 2-part: to CAN/CGSB-19.24, Type 1, Class B.

.2 Non-drying butyl sealant to AAMA 809

.3 Silicones one part: to CAN/CGSB-19.13.

.4 Structural silicones to CAN/CSGB 19.13 M87

.5 Acrylics one part: to CGSB 19-GP-5M.

.6 Acrylic latex: one part, non sag siliconized acrylic polymer to CAN/CGSB-19.17.

.7 Preformed compressible and non-compressible back-up materials:

.1 Polyethylene, urethane, neoprene or vinyl foam:

.1 Extruded closed cell foam backer rod.

.2 Sized as required.

.2 Neoprene or butyl rubber:

.1 Round solid rod, Shore A hardness 70.

.3 High density foam:

.1 Extruded closed cell polyvinyl chloride (PVC), extruded polyethylene, closed cell, Shore A hardness 20, tensile strength 140 to 200 kPa,

extruded polyolefin foam, 32 kg/m^3 density, or neoprene foam backer, size as recommended by manufacturer.

.4 Bond breaker tape:

.1 Polyethylene bond breaker tape which will not bond to sealant.

2.3 SEALANT SELECTION

.1 Roof and wall panel connections

.1 Non -drying, self-healing, butyl rubber sealant.

.2 Flashings applied at wall and roof junctions.

.1 High performance single component neutral cure structural silicone to CAN/CSGB 19.13 M87, Clear colour

.3 Junctions between subfloor floor edges and exterior wall panels to produce permanent sealed vapour-resistant joints.

.1 Polyurethane, self-levelling.

.4 Penetrations in exterior walls to fill joints watertight including but not limited to exterior perimeters of door frames, window frames, curtain wall frames; exterior perimeters of wall vents; exterior perimeters of all other wall penetrations.

.1 Polyurethane, non-sag.

.5 Interior perimeters of door frames and trims, window and curtain wall frames to make junctions filled, smooth and invisible suitable for subsequent "painting out" with interior wall finishes.

.1 Acrylic latex.

.6 Gypsum board control joints: to make joints suitable for subsequent "painting out" with interior wall finishes.

.1 Acrylic latex.

.7 Junctions between counter tops and walls to produce permanent sanitary and watertight seal; junctions between plumbing fixtures and walls, floors and counter tops/vanities to produce permanent sanitary and watertight seal. Co-ordinate with plumbing trade to avoid omission/duplication.

.1 Mildew-resistant silicone.

2.4 JOINT CLEANER

.1 Non-corrosive and non-staining type, compatible with joint forming materials and sealant in accordance with sealant manufacturer's written recommendations.

.2 Primer: in accordance with sealant manufacturer's written recommendations.

Part 3 Execution

3.1 SURFACE PREPARATION

.1 Examine joint sizes and conditions to establish correct depth to width relationship for installation of backup materials and sealants.

.2 Clean bonding joint surfaces of harmful matter substances including dust, rust, oil grease, and other matter which may impair Work.

.3 Do not apply sealants to joint surfaces treated with sealer, curing compound, water repellent, or other coatings unless tests have been performed to ensure compatibility of materials. Remove coatings as required.

.4 Ensure joint surfaces are dry and frost free.

.5 Prepare surfaces in accordance with manufacturer's directions.

3.2 PRIMING

.1 Where necessary to prevent staining, mask adjacent surfaces prior to priming and caulking.

.2 Prime sides of joints in accordance with sealant manufacturer's instructions immediately prior to caulking.

3.3 BACKUP MATERIAL

.1 Apply bond breaker tape where required to manufacturer's instructions.

.2 Install joint filler to achieve correct joint depth and shape, with approximately 30% compression.

3.4 MIXING

.1 Mix materials in strict accordance with sealant manufacturer's instructions.

3.5 APPLICATION

.1 Sealant:

.1 Apply sealant in accordance with manufacturer's written instructions.

.2 Mask edges of joint where irregular surface or sensitive joint border exists to provide neat joint.

.3 Apply sealant in continuous beads.

.4 Apply sealant using gun with proper size nozzle.

.5 Use sufficient pressure to fill voids and joints solid.

.6 Form surface of sealant with full bead, smooth, free from ridges, wrinkles, sags, air pockets, embedded impurities.

.7 Tool exposed surfaces before skinning begins to give slightly concave shape.

.8 Remove excess compound promptly as work progresses and upon completion.

.2 Curing:

.1 Cure sealants in accordance with sealant manufacturer's instructions.

.2 Do not cover up sealants until proper curing has taken place.

3.6 CLEANING

.1 Clean in accordance with Section 01 74 11 - Cleaning.

END OF SECTION

PART 1 GENERAL

1.1 SECTION INCLUDES

.1 Non-rated, fire rated and thermally insulated steel frames.

.2 Non rated metal window and sidelight frames

.3 Non-rated, fire rated and thermally insulated steel doors.

.4 Cooler door: thermally insulated, steel door and frame.

1.2 RELATED SECTIONS

.1 Section 08 71 00 - Door Hardware: Hardware, silencers, and weather-stripping.

.2 Section 09 91 23 - Painting: Field painting of frames.

1.3 REFERENCES

.1 ASTM A653/A653M - Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.

.2 CSDFMA (Canadian Steel Door and Frame Manufacturers Association).

.3 DHI - Door Hardware Institute: The Installation of Commercial Steel Doors and Steel Frames, Insulated Steel Doors in Wood Frames and Builder's Hardware.

.4 NFPA 80 - Fire Doors and Windows.

.5 NFPA 252 - Fire Tests for Door Assemblies.

.6 UL 10B - Fire Tests of Door Assemblies.

.7 SDI-100 - Standard Steel Doors and Frames.

.8 ASHRAE 90.1 2013- Energy Standard for Buildings Except Low Rise Residential Buildings

1.4 SUBMITTALS

.1 Section 01 33 00: Submission procedures.

.2 Product Data: Indicate frame configuration and finishes. Indicate door configurations, location of cut-outs for hardware reinforcement.

.3 Shop Drawings: Indicate frame elevations, reinforcement, anchor types and spacings, location of cut-outs for hardware, and finish. Indicate door elevations, internal reinforcement, closure method, and cut-outs for glazing, louvers, and finishes.

1.5 QUALITY ASSURANCE

.1 Conform to requirements of CSDFMA SDI-100.

1.6 REGULATORY REQUIREMENTS

.1 Fire Rated Frame Construction: Conform to UL 10B.

.2 Installed Door and Frame Assembly: Conform to NFPA 80 for fire rated class as scheduled.

1.7 PROJECT CONDITIONS

.1 Coordinate the work with frame opening construction, door, and hardware installation.

PART 2 PRODUCTS

2.1 DOORS

.1 Exterior doors: Air infiltration to comply with ASHRAE Standard 90.1 2010 & 2013 requirements of less than .4 CFM/FT^2

.2 Insulated Core Doors:

.1 Door faces, top and bottom end channels: minimum 1.2 mm.

.2 Cores: Polyurethane to CAN/ULC-S701 Rigid, modified polyisocyanurate, closed cell board. Density 32kg/m3.

.3 Interior honeycomb core doors: minimum ,1.2 mm surface sheets and top and bottom end channels; cores filled with honeycomb material laminated under pressure to surface sheets.

.4 Fire Rated Doors: Minimum , 1.2 mm surface sheets and, top and bottom end channels, of ULC label requirements indicated on drawings.

.5 Reinforcement for hardware:

.1 Locks: minimum 1.52 mm steel.

.2 Butts: minimum 3.42 mm steel.

.3 Flush Bolts: minimum 3.42 mm steel.

.4 Door Closures: minimum 1.9 mm steel.

.6 Glazing Stops: 0.9 mm rolled steel channel shape, butted corners; 16 mm high profile; prepared for countersink screws.

.7 Cooler door: pre-painted, 26 gauge embossed steel pans front and back with reinforcement for hardware attachment. 100mm non-CFC polyurethane insulation core. Integral frame and hardware. Frame; metal clad pre-painted, 26 gauge embossed steel with insulation to match door. Hardware: self rising hinges, interior safety release, latching exterior handle. Gasket to sides and head of door, sweep type sill gasket. Door, frame, hardware and all components to be complete package from single manufacturer.

2.2 FABRICATION DOOR FRAMES

.1 Frame material not less than 1.6 mm metal thickness for openings to 1220 mm in unsupported width; not less than 2.0 mm metal thickness for openings exceeding 1220 mm in unsupported width.

.2 Fabricate frames in accordance with CSDMA specifications and following requirements

.3 Fabricate frames with hardware reinforcement plates welded in place.

.4 Reinforce frames wider than 1 200 mm with roll formed steel channels fitted tightly into frame head, flush with top.

.5 Prepare frames for silencers. Provide three single silencers for single doors and mullions of double doors on strike side. Provide two single silencers on frame head at double doors without mullions.

.6 Prepare frames for Doors 100 and 116 for installation of electric strikes.

.7 Attach fire rated label to each fire rated door unit.

.8 Glazing Stops: 0.9 mm rolled steel channel shape, butted corners; 16 mm high profile; prepared for countersink screws.

.9 Provide drywall returns on all frames.

.10 Attach channel spreaders at bottom of frames for shipping.

2.3 FRAME ANCHORAGE

.1 Provide appropriate anchorage to floor and wall construction.

.2 Locate each wall anchor immediately above or below each hinge reinforcement on hinge jamb and directly opposite on strike jamb.

.3 Provide 2 anchors for rebate opening heights up to 1520 mm and 1 additional anchor for each additional 760 mm of height or fraction thereof

2.4 FRAMES: KNOCKED-DOWN TYPE

.1 Ship knocked-down type frames unassembled.

.2 Provide frames with mechanical joints which inter-lock securely and provide functionally satisfactory performance when assembled and installed in accordance with CSDMA Recommended Installation Guide for Steel Doors and Frames.

.3 Securely attach floor anchors to inside of each jamb profile.

2.5 FABRICATION - DOORS

.1 Fabricate hollow metal doors and panels in accordance with requirements of "Canadian Manufacturing Standards for Steel Doors and Frames" produced by the Canadian Steel Door and Frame Manufacturer's Association and as indicated on Drawings. Fabricate doors with hardware reinforcement welded in place.

.2 Fabricate fire rated hollow metal doors in accordance with requirements of Underwriters Laboratories of Canada (ULC). Place ULC labels where visible when in installed position.

.3 Longitudinal seams: Mechanically interlocked, continuously welded, filled and sanded with no visible edge seams. Top and bottom of doors closed with end channels recessed and spot welded in place.

.4 Reinforce and prepare doors to receive hardware. Refer to Section 08 71 00 for hardware requirements.

2.6 COOLER DOOR & FRAME

.1 Cooler door: pre-painted, 26 gauge embossed steel pans front and back with reinforcement for hardware attachment. 100mm non-CFC polyurethane insulation core. Integral frame and hardware. Frame; metal clad pre-painted, 26 gauge embossed steel with insulation to match door. Hardware: self rising hinges, interior safety release, latching exterior handle. Gasket to sides and head of door, sweep type sill gasket. Door, frame, hardware and all components to be complete package from single manufacturer.

.2 Product specifications based on Jamison Plyfoam II cooler door.

PART 3 EXECUTION

3.1 EXAMINATION

.1 Verify existing conditions before starting work.

.2 Verify that opening sizes and tolerances are acceptable.

3.2 INSTALLATION

.1 Install frames in accordance with CSDFMA.

.2 Coordinate with gypsum board wall construction for anchor placement.

.3 Coordinate installation of glass and glazing.

.4 Coordinate installation of doors and frames with installation of hardware specified in Section 08 71 00

.5 Install roll formed steel reinforcement channels between two abutting frames. Anchor to structure and floor.

.6 After installation, touch up all scratched or damaged surface and prime.

.7 Insulate all frames exposed to the exterior.

.8 Install door louvers, plumb and level.

3.3 ERECTION TOLERANCES

.1 Maximum Diagonal Distortion: 1.5 mm measured with straight edges, crossed corner to corner.

.2 Clearance on steel doors at head and jambs shall be: 3 mm maximum, maximum between pairs of doors

3.4 ADJUSTING

.1 Adjust door for smooth and balanced door movement.

3.5 CLEANING

.1 Do cleaning in accordance with Section 01 74 11 - Cleaning.

END OF SECTION

1.0 GENERAL

1.1 WORK INCLUDED

.1 Window frames and sashes consisting of extrusions of polyvinyl chloride (PVC).

.2 Windows as pre-assembled units, including factory installation of glass and glazing.

.3 Furnish all labour, materials, equipment and services required for the design, fabrication, supply and installation of windows as shown on the drawings and as specified. Furnishment to include, but not be limited to the following:

- .1 Fully glazed vinyl window assemblies including vinyl shapes and glass.
- .2 All glazing accessories for window assemblies including gaskets, setting blocks, and sealants as required to meet the air and water tightness requirements of the section.
- .3 All necessary reinforcing members, brackets, anchors, fasteners and other accessories as required to meet the structural requirements of the installation and specifications in this section.
- .4 Shop applied galvanizing and electrolytic barrier painting of all steel parts.
- .5 All perimeter closures, membranes, sealants, flashings, and trim required to integrate the window assemblies with other cladding and finishing materials.
- .6 Assessment of the alignment of the existing façade elements as required to allow design and layout of the work in this section.
- .7 All fastening of the window assemblies to the rough openings

.4 Include also the following:

- .1 Checking of building lines and levels as required for the proper layout and installation of all work included in this section.
- .2 Shop painting of all steel shapes and ferrous metal used in attachment or reinforcing of window and field painting after steel shapes are installed.

.5 Window systems of the following types:

- .1 Single fixed lites.
- .2 Composite, with fixed lites and operable casement lites.

1.2 REFERENCE STANDARDS (Most recent version unless noted otherwise.)

.1 AAMA/WDMA/CSA101/I.S.2/A440-08-NAFS- North American Fenestration Standard/ Specification for windows, doors, and skylights

.2 CSA A440S1 – 09 “Canadian Supplement to AAMA/WDMA/CSA101/I.S.2/A440-08 – NAFS – North American Fenestration Standard/Specification for windows, doors, and skylights”

.3 British Columbia Energy Efficiency Act – Energy Efficiency Standards Regulation (BCEEA)

.4 CAN/CSA-A440-Windows; A440.1 User Selection Guide to A440; A440.2 Energy Performance Evaluation; A440.3 User Guide to A440.2; A440.4 Window and Door Installation.

.5 CAN/CSA-G164-Hot-Dip Galvanizing of Irregularly Shaped Articles

.6 CAN/CGSB-1.40-Primer, Structural Steel, Oil Alkyd Type.

.7 ASTM D4216, Standard Specification for Rigid Polyvinyl Chloride (PVC) and Related PVC and Chlorinated Polyvinyl Chloride (CPVC) Building Products Compounds.

.8 ASTM D4726, Standard Specification for Rigid Polyvinyl Chloride (PVC) Exterior-Profile Extrusions Used for Assembled Windows and Doors

.9 Glazing Contractor's Association of B.C. (GCABC) publication: Glazing Systems Specifications Manual

.10 IGMA Glazing Recommendations for Sealed Insulating Glass Units.

1.3 DEFINITIONS

.1 Single Unit Window: a window consisting of one fixed or one operable lite.

.2 Composite Window: a window consisting of a maximum of three lites in one main frame. Composite windows may consist of fixed or operable windows, or a combination of both.

1.4 DESIGN CRITERIA

.1 Materials, fabrications, attachments, accessories, assembly and performance, other that thermal performance, shall meet or exceed applicable requirements of CSA-A440, Windows, including appendices. The more stringent of CSA-A440 or this specification shall apply.

.2 Thermal performance shall be determined in conformance with CSA-A440.2, Thermal Performance Evaluation of Windows and Sliding Glass Doors, and Appendix A – Overview of the Procedure for Determining the U-Value by Computer Simulation.

.3 Design windows to be glazed from the interior.

.4 Design windows to equalize both positive and negative pressure between outside air and:
- .1 cavities surrounding insulating glass units, and
- .2 cavities surrounding operable sash.

.5 Design windows to provide drainage from spaces around operable sash and around insulating glass units to exterior.

.6 Design windows to provide for the continuity of the air seal from the inside face of the sealed unit to the surrounding frame.

.7 Design window anchorage to withstand wind load equal to or greater than calculated loads as per CSA A440S1-09 in accordance to the Performance Class specified herein or to Part 4 of the BC Building Code.

.8 Design vinyl components to accommodate thermally induced movement and to prevent creep deflection. Limit of creep deflection 3mm per meter in any member or assembly.

.9 Design assembly to accommodate structure movements due to wind, seismic, creep and live loads where applicable and/or as noted.

1.5 PERFORMANCE REQUIREMENTS

.1 This is a performance specification issued in conjunction with the drawings for the work. The drawings show the general arrangement of the finished work and these specifications described the minimum requirements of the finished system. The Contractor is responsible for designing and furnishing a window system that will fulfill the requirements of the specifications and drawings including items which may not be shown or specified but are required for performance of the system.

.2 The window shall be designed, fabricated and installed to meet or exceed the criteria in this subsection.

.3 Structural

- .1 Wind Load Resistance to NAFS in conjunction with CSA A440.09.
- .2 The window assembly and fasteners shall be designed to withstand negative and positive wind loads in accordance to BCBC using an annual probability factor of **1/50 years** for the reference wind velocity, and 8 per 1000 glass failure rate under this load.
- .3 The glass and window frames shall be designed to withstand guard loads at locations required by the BCBC.
- .4 The glass shall be designed to withstand thermal stresses imposed in service. In calculation, assume the use of blinds located not less than 50 mm from the inside surface of the glass.
- .5 The window system shall be designed to limit deflection orthogonal to the plane of the glass under wind or guard loads to **L/175** in all clear span dimensions of glass and framing members.
- .6 Anchors and fasteners shown on the drawings do not represent the required location or types required for installation of the new widow. Any attachment points must be shown on shop drawings for review by the Consultant.
- .7 All fastenings and attachments shall be concealed.
- .8 Movement and Tolerances
  - .1 The window installation shall accommodate a building structure live load deflection of 9 mm at midspan of longest project window header/lintel without transferring load to the window.
  - .2 The window shall accommodate expansion and contraction of component materials over an exterior air temperature range of -18ºC to 35ºC and a possible solar heating range to 70ºC, and an interior temperature range of 0ºC to 30ºC without causing:
    - .1 failure of joint seals necessary for air and water tightness of the system,
    - .2 failure of perimeter seals at interfaces to adjacent wall systems,
    - .3 overstressing of fasteners,
    - .4 pinching or distortion or breakage of glass,
    - .5 distortion of aluminum members,

.6 or other harmful effects.

.4 The window shall be fabricated and installed square, level and plumb as follows:
- .1 Plumb to within 3 mm of vertical over the height of each unit.
- .2 Within 3.0 mm of level relative to a datum established for frames at the same floor.
- .3 Within 1.5 mm of level relative to an adjacent frame.
- .4 Each frame shall be within 3.0 mm of square when measured across the diagonals.
- .5 Clearances required for installation should be considered and indicated on the shop drawings.
- .6 All movements of the window system shall be noiseless.

.5 Weather Tightness
- .1 Water Tightness to NAFS in conjunction with CSA A440.09 .
- .2 The glazing system shall be installed so that it forms a continuous unbroken air seal on the room side of the assembly. The air seal shall extend from the glazing assembly to adjoining wall components at all interfaces. Airtightness of the window and interfaces shall restrict infiltration and exfiltration of air through the system in accordance to NAFS.
- .3 The window system shall be designed in accordance with rainscreen principles, incorporating venting and drainage mechanisms and separate air and water barriers, effective so that any water entering the system past exterior seals drains harmlessly to the exterior via pressure equalized drainage cavities.
- .4 Vent and drain holes shall be present in inconspicuously locations and shall not contribute to staining or marking of glass, mullions, or spandrels.

.6 Durability
- .1 The window frames and integral seals shall be designed to have an expected service life of 30 years. All seals, gaskets, corrosion protection, coatings and attachments are expected to be serviceable at the end of this service period.

- .2 The glazing shall have a guaranteed service life of five years. Any glazing failing to meet this service life shall be removed and replaced at no cost to the Owner under guarantee by the Contractor. Failure of any glazing shall be deemed to occur if any of the following are noted:
  - .1 Chipping, cracking, or breakage of glass panes occurring due to manufacturing defects or under specified service conditions.

- .3 Seals between unitized components of the glazing system shall be formed with clamped rubber gaskets. Seals between frame units made with field applied sealants alone will not be accepted.

1.6 RESPONSIBILITY FOR MEETING PERFORMANCE REQUIREMENTS

.1 Meeting the performance requirements of this section during the design fabrications and installation of the work shall be the complete responsibility of the Contractor.

.2 The details shown on associated drawings show dimensions and profiles similar to those expected to be required to meet the specifications of this section. The Contractor may submit design proposals with minor changes to the details shown on the drawings in order to meet or exceed the performance requirements of this section by using proprietary technology. Every effort has been made to show on the drawings and in the specification items of the design that may not be altered or altered only to limited extents.

.3 The structural and energy use requirements of this section shall be certified by an Engineer employed by the Contractor using standards recognized by the local authority having jurisdiction, the product manufacturer and current trade associations.

.4 The design of the product and the responsibility of the Contractor's Engineer shall extend to accommodate all temporary conditions associated with fabrication, transport, storage, lifting, installation and temporary closure of the building without detrimental effect on the performance requirements of these contract documents.

.5 The Consultant's review of the Contractor's submittals and the work is of the benefit only of the Owner. The Contractor shall remain responsible for the design, fabrication, installation and performance of the product.

1.7 SUBMITTALS

.1 Submittals to be made in accordance with Section 01 33 00 - Submittals.

.2 Product Data: Submit catalogue details for each type of window and framing system illustrating profiles, dimensions and methods of assembly, installation procedures, recommendations and data that products have been tested and comply with performance requirements.

.3 Submit test reports form an independent testing agency acceptable to the Consultant, indicating windows to be supplied for the project meet specified requirements, including compliance with AAMA/WDMA/CSA101/I.S.2/A440-08- NAFS. Testing conducted by manufacturer to follow all required product test and sequence tests as described under Clause 5 in AAMA/WDMA/CSA101/I.S.2/A440-08- NAFS in conjunction with CSA A440S1-09.

.4 Energy Conformance: Supply documentation sufficient to confirm conformance of project window sizes and configurations with the British Columbia Energy Efficiency Act, using one of the following testing agencies or persons.
- .1 A person or organization accredited by the Standards Council of Canada
- .2 National Fenestration Rating Council accredited Inspection Agency
- .3 Architect or Professional Engineer, authorized to practice in British Columbia.

.5 Shop Drawings:
- .1 Submit shop drawings of windows prepared under the supervision and bearing the seal of a Professional Engineer of the Province of BC. Submit completed BC Building Code Letters of Assurance (Schedules B1 and B2) together with the initial shop drawing submission. Upon request, provide structural calculations per conformance to Building Codes, By-Laws and CAN/CGSB 12.20.
- .2 Clearly indicate each type of window, hardware and locations, framing system,

extrusion profiles, methods of assembly, section and hardware reinforcement, anchorages and location of exposed fasteners, isolation coatings, finishes, glazing components, insect screens, and location of manufacturer's name plates (if applicable).

.3 Provide scaled elevations, sections, plans, dimensions and quantity of units. Indicate rough opening requirements and tolerances of adjacent construction.

.4 Provide full size details for head, sill and jamb conditions, junctions between combination units (coupling mullions), and interior and exterior trim. Clearly indicate method and location of connection and continuity of the envelope air, vapour and water seals. Clearly indicate drainage and ventilation paths within the window assembly and at the interface to the building envelope. Confirm compatibility of materials that form the air/vapour/water barrier of the integrated system.

.5 Provide manufacturer's assembly instructions for operable units if they will be supplied demounted from main frame.

.6 Shop drawings are submitted to allow the Departmental Representative to review conformance of the proposed system. Review of the shop drawings by the Departmental Representative shall not relieve the Contractor of any responsibilities to perform under the terms of this specification. Notify the Departmental Representative of any sequencing of submittals and reviews that will expedite the Contractor's delivery of the project

.7 No materials shall be purchased or units fabricated until final review of shop drawings is completed by the Departmental Representative.

.6 Samples: If requested, make the following samples available for Departmental Representative review at least one week prior to shop drawing preparation:

.1 150 mm long corner sections of head, jamb, sill, mullions, and coupling mullions to indicate profile.

.2 One (1), 4'x 4' with 2' operable section, representative model of each type of window.

.7 Letters of Assurance: The Registered Professional Engineer who signed and sealed the shop drawings shall perform sufficient field reviews in order to provide a letter of professional assurance after completion of the Work, giving assurance that the Work has been fabricated and installed in general conformance with the sealed shop drawings. Approved forms are BC Building Code Letters of Assurance (Schedule C). Written inspection reports of field reviews shall be submitted to the Architect promptly as the field reviews are made.

.8 Maintenance Data: Provide in accordance with Section 01 78 10 – Maintenance and Renewal Manual, the following data for incorporation into specified maintenance manual:

.1 A recommended inspection procedure and schedule and component replacement schedule.

.2 Data for cleaning and maintenance of framing finishes, glazing and hardware.

.9 Warranties:

.1 Provide a written warranty signed and issued in the name of the Owner stating:

.1 All windows will be free from defects in material and workmanship for a period of two (2) years from the date of substantial Performance of the Work.

.2 All windows will continue to provide satisfactory resistance to water penetration for a period of five (5) years from the date of Substantial Performance of the Work.

.3 All insulating sealed double glazing units shall be covered for a period of ten (10) years from the date of Substantial Performance of the Work, against material obstruction of vision as a result of hermetic seal failure and dust or film formation on inner glass surfaces.

.2 If a 3rd party warranty is provided then the warranty requirements are to be the most stringent of the 3rd party warranty or the requirements listed above or the requirements in Section 01 78 36 Warranties and Bonds.

.3 Satisfactory performance means compliance with the performance criteria and the testing and construction standards of this specification, and with the reviewed shop drawings. This includes the performance of finishes, hardware glass and glazing materials, structural attachment, sealants and flashings.

.4 Correct all deficiencies that appear during the warranty period at no cost to the Owner.

1.8 QUALITY ASSURANCE

.1 Sealed insulation unit manufacturer to be a member in good standing of the Insulating Glass Manufacturers Alliance (IGMA).

.2 Glass and glazing work under this section to conform to IGMA standards.

.3 Window manufacturer and installation contractor to be a member in good standing of the Glazing Contractors Association of BC (GCABC) and have a minimum of 5 years uninterrupted experience in successfully carrying out projects of similar size. Contractor to document past experience on request.

2.0 PRODUCTS

2.1 WINDOWS

.1 Description: sash comprised of purpose-made vinyl extrusions, thermally broken, rain screen design with pvc sub sill, exterior flange mount, fitted with insulated glass unit glazing and rigid extruded vinyl snap-in glazing stop, in sizes and arrangements detailed/indicated.

2.3 SINGLE UNIT WINDOWS

.1 Meet or exceed requirements of selected Performance Class and Performance Grade as

per AAMA/WDMA/CSA101/I.S.2/A440-08- NAFS- North American Fenestration Standard/Specification for windows, doors, and skylights and CSA A440S1- 09 – Canadian Supplement to NAFS and the secondary performance requirements:

.1 All windows shall conform to:
  .1 Class **CW – PG30 (metric)** - Fixed
  .2 Class **CW – PG30 (metric)** – Casement and Awning
.2 Water Penetration: Water penetration test pressures shall be **400 Pa.**
.3 Air Tightness Rating, Fixed Windows: Fixed Level.
.4 Air Tightness Rating, Operable Windows: A3 Level
.5 Operation Force for: Casement window - Normal Use (Clause 5.3.1.1, Table 6)
.6 Energy Performance: Overall Window U-Value averaged over all fenestration products within the scope of work to be no more than **1.8 W/m2•K**.
.7 All windows are to be labeled with the AAMA, CSA or WDMA label and have sash, leaf and size shown on the drawings.

2.4 COMBINATION WINDOWS

.1 Meet or exceed requirements of selected Performance Class and Performance Grade as per AAMA/WDMA/CSA101/I.S.2/A440-08- NAFS- North American Fenestration Standard/Specification for windows, doors, and skylights and CSA A440S1- 09 - Canadian Supplement to NAFS, and the secondary performance requirements. Refer to Clause 2.1.1 for Window Performance Grades and Energy Performance.

.2 Air and water tightness of joints along frames mulled together, and at mullions where lites within one main frame join, shall meet or exceed performance ratings specified for the higher rated adjacent single unit windows.

.3 Lateral deflection of mulled frames shall not exceed **L/175** of span when subjected to loading equivalent to wind load resistance of the adjacent single unit windows.

2.5 WINDOW TYPES

.1 Fixed: with removable double-glazed insulated sealed units. Minimum performance standard to meet AAMA/WDMA/CSA 101/I.S.2/A440-08 – NAFS Class CW-PG30.
.2 Casement (Outswing sash): with removable double-glazed insulated sealed units. Minimum performance standard to meet AAMA/WDMA/CSA 101/I.S.2/A440-08 – NAFS Class CW-PG30.
.3 Casement (Outswing sash): with removable triple-glazed insulated sealed units. Minimum performance standard to meet AAMA/WDMA/CSA 101/I.S.2/A440-08 – NAFS Class CW-PG30.
.4 Screens: provide on ventilating portions of windows.

2.6 FRAME AND SASH REQUIREMENTS

.1 Frame and sash profiles and glazing detailed on drawings are not intended to restrict product types conforming to these specifications.

.2 Provide PVC frame and sash conforming to the following standards:
- .1 ASTM D4726, Standard Specification for Rigid Poly Vinyl Chloride (PVC) Exterior-Profile Extrusions Used for Assembled Windows and Doors.
- .2 ASTM D4216, class 1 32021 42 4040 or equivalent standard for weathering and mechanical properties.
- .3 Can/CGSB 41-GP-19MA, Rigid Vinyl Extrusions for Windows and Doors. The material shall show no reduction in surface gloss or colour after 10,000 hours in a UV arc weather-o-meter.
- .4 Minimum external wall thickness of extrusions: 2.5 mm nominal, exceeding requirements of CSA-A440 for vinyl (PVC) window wall types A, B, and C.

.3 Seal sash perimeter continuously at three locations minimum, with primary seal located between operator and interior seal.

.4 Secure hardware and attachments using screws into H-ports or penetrating minimum of two walls of framing or internal steel reinforcement.

.5 Join single units to form combination units with joints at combination unit frame perimeter finished with sealant and steel plate, 75 mm x 75% of depth of framing. Plate shall be screw fastened with a minimum of four screws through plastic into steel reinforcing.

.6 Anchor using metal retaining clips at head, nailing flanges at jambs and continuous back angle at sill.

2.7 GLASS AND GLAZING MATERIAL

.1 Insulating Glass Units: meet or exceed requirements as described in AAMA/WDMA/CSA101/I.S.2/A440-08- NAFS and CSA A440S1- 09 - Canadian Supplement to NAFS . Units shall be certified by the Insulating Glass Manufacturers Alliance (IGMA). Overall unit thickness shall be a minimum of 20 mm using a minimum of 4 mm glass thickness. Triple pane units overall unit thickness shall be a minimum of 36 mm using a minimum of 4 mm glass thickness. In combination and composite units use the greater glass thickness throughout. Use two-stage seal method of manufacture, as follows:
- .1 Primary Seal: polyisobutylene or hot-melt butyl.
- .2 Secondary Seal: polyisobutylene, silicone or polysulphide based sealant, filling gap between the two lites of glass at the edge up to the spacer/separator and primary seal.
- .3 Spacer/separator: non-conductive, as required to suit performance requirements.

.3 Insulated glass unit assembly to provide following minimum performance requirements. Following is based on 6 mm thick Low E glass in 25 mm thick insulating unit with 13 mm thick Argon gas filled space and 6 mm thick clear inner glass.

.1 Transmittance:

Ultra-violet (UV) light: 19%
Visible daylight: 70%
Total solar energy: 33%

.2 Reflectance:

Visible light: 11%

Total solar energy: 30%

.3 U-values (Imperial):
Winter night time: 0.29
Summer day time: 0.28

.4 Shading coefficient factor: 0.44

.5 Solar heat gain coefficient: 0.38
.6 Light-to-solar gain (LSG): 1.84

.2 Clear Float Glass: to CAN/CGSB-12.3, glazing quality, for inner and outer lite.

.4 Glazing Gaskets for PVC Sections: neoprene, thermoplastic rubber or EPDM, flexible at minimum design temperature, and as follows:
.1 Profiles with a minimum of two (2) fins to contact glazing at interior and exterior of glass units
.2 Designed to maintain pressure contact against glass units through design temperature range.
.3 Co-extruded gaskets are not acceptable on the main frame or sash.
.4 Foam or butyl glazing tapes are not acceptable.

.5 Other Glazing Accessories: setting blocks to AAMA/WDMA/CSA101/I.S.2/A440-08-NAFS.

2.8 HARDWARE

.1 Exposed Hardware Components: cast metal, in finish selected by Consultant from hardware manufacturer's standard range.

.2 Hardware exposed to exterior environment with sash in closed and open positions shall be corrosion-resistant stainless steel or bi-chromated steel composites.

.3 Secure hardware and attachments using screws into H-ports or penetrating a minimum of two walls of framing. Wherever possible provide metal reinforcement embedded in vinyl frames at screw attachment locations.

.4 Equip operable windows with hardware as follows:
.1 Casement: concealed dual arm operator and stainless steel tracks, with under screen roto operator assembly. Provide multi-point locking with single handle operation.
.2 Hardware to be adjustable to accommodate compression set of weather and air seals.

.5 Provide ADA approved handles for roto operators.

.6 Force to operate locking devices shall not exceed 20 N.

.7 Provide pole operated hardware where window latching devices are located in excess of 1900 mm above floor level:

2.9 ACCESSORIES

.1 Weatherstripping for operable sash: neoprene, thermoplastic rubber or EPDM, flexible at minimum design temperature, and as follows:
- .1 Profiled to mechanically key into window and sash framing members, at interior and exterior of sash.
- .2 Removable without special tools and without dismantling of frames.
- .3 Designed to maintain pressure contact against frame through design temperature range.
- .4 Provide a minimum of one weather seal gasket to the exterior and one air seal gasket to the interior of drained and vented cavities.

.2 Steel Reinforcement: sheet steel to ASTM A653M, hot dip galvanized, minimum Z275 coating designation.

.3 Transition membrane: minimum1.6 mm thick SBS membrane sheet reinforced with non-woven polyester or glass fleece. Stripping to be a minimum 150mm wide. Approved products are:
- .1 Soprema – Sopraseal 60 F/F or Sopralene Flam Stick
- .2 Protectowrap Jiffyseal 140/60.
- .3 Bakor Blueskin TG.

.4 Joint Sealants: as specified in Section 07 92 10, as recommended for substrates.

.5 Foam Backer Rod: extruded closed cell backer rod, oversize 30 to 50%.

.6 Screens: To CAN/CGSB-79.1.
- .1 Insect screening mesh: count 18 x 16.
- .2 Fasteners: tamper proof.
- .3 Screen frames: vinyl or aluminum, colour to match window frames.

2.10 FRAME AND SASH FINISHES

.1 Vinyl: as selected by the Consultant from the manufacturer's colour range.

2.10 AIR/VAPOUR RETARDER

.1 Ensure continuity of air/vapour retarder and seal from walls to window frame.

3.0 EXECUTION

3.1 FABRICATION

.1 Fabricate window units square and true with maximum tolerance of plus or minus 1.5 mm for units with a diagonal measurement over 1800 mm.

.2 Mitre and heat weld full length of vinyl frame and sash joints at corners. All welding flash to be neatly removed.

.3 Fasten steel reinforcement to extruded vinyl mullions with concealed stainless steel fasteners at maximum 300 mm o/c.

.4 Continuously and uniformly compress length of gaskets during installation, to compensate for linear shrinkage.

3.2 GLAZING

.1 Clean sealing surfaces at perimeter of glass and sealing surfaces of rabbets and stop beads before applying tape, splines or gaskets. Use solvents and cleaning agents recommended by manufacturer of sealing materials.

.2 Install glazing gaskets uniformly with accurately formed corners and bevels. Ensure that proper contact is made with glass and rabbet interfaces.

.3 Support both lites of glass thermal units on levelled setting blocks, 4 or 6 mm minimum, spaced as recommended by glass manufacturer. Provide at least one setting block at quarter points from each corner. For casement windows, locate setting blocks closer to corners as recommended by manufacturer.

.4 Centre glass thermal units in glazing rabbet to maintain 6 mm minimum clearance between edges of glazing and plastic framing at sill or 4 mm minimum clearance between edges of glazing and plastic framing at sill if glazing bite incorporates a drainage channel with depth of 3 mm minimum.

.5 Size glass thermal units to ensure exposed face of spacer is in line with glazing stops.

.6 Use spacers and shims in accordance with glass manufacturer’s recommendations.

.6 Immediately replace damaged or broken glass.

3.3 WINDOW INSTALLATION

.1 Install in accordance with CAN/CSA-A440 and reviewed shop drawings.

.2 Arrange components to prevent abrupt variation in colour.

.3 Erect and secure window units in prepared openings, plumb and square, free from warp, twist or superimposed loads.

.4 Secure work accurately to structure and in a manner not restricting thermal movement of materials.

.5 Transfer window dead load to wall construction by anchors alone or in combination with

plastic shims. Wood shims are not acceptable.

.6 Place shims under sill frame at exact setting block locations, and as marked on frames by window frame manufacturer.

.7 Conceal all anchors and fitments. Exposed heads of fasteners are not permitted.

.8 Maintain dimensional tolerances after installation. Maintain alignment with adjacent work.

.9 Provide seal around interior perimeter of window frame using foam joint sealant or foam backer rod, size as required to lightly compress between frame and rough opening, and sealant. Ensure continuity of air/vapour retarder and seal to window frame.

.10 Provide seal at head and jamb of exterior perimeter of window frame using foam joint sealant or foam backer rod, size as required to lightly compress between frame and rough opening, and sealant. Do not seal sill at exterior.

.11 Install jamb extensions, casings, brick moulds and trim as indicated on drawings.

.12 Install sealant, in accordance with Section 07 92 10, and related materials as indicated on drawings.

.13 Adjust operable sash and hardware to operate smoothly.

.14 Temporary installations of windows if needed are to meet all requirements for occupant and public safety, such as but not limited to, operable unit restrictors, fastening, sharp edges etc.

3.5 CAULKING

.1 Seal joints between windows and window sills with sealant. Bed sill expansion joint cover plates in bedding compound. Caulk butt joints in continuous sills.

.2 Apply sealant in accordance with Section 07 92 00 - Sealants. Conceal sealant within window units except where exposed use is permitted by the Consultant.

3.6 PROTECTION AND CLEANING

.1 Do cleaning in accordance with Section 01 74 11 - Cleaning.

.2 Protect windows/doors from damage/staining during and after installation.

.3 Clean interior and exterior surfaces as soon as adjacent contaminating activities are completed, to recommendations of window manufacturer.

3.7 ENERGY CERTIFICATE

.1 Site certificates to be supplied in accordance with the British Columbia Energy Efficiency Act.

.2 Certificates to include the following information:

.1 The whole-product U-value for each fenestration product provided on site (in W/m2K).
.2 The overall average U-value for the whole project, averaged over every fenestration product in the scope of work (in W/m2K).
.3 The name of the person or agency acting as verifier for the fenestration products.

.3 Certificates are to be posted in plain view at the project site for a period of at least 120 days after the last manufactured fenestration product is installed in the building.

END OF SECTION

Part 1 General

1.1 SECTION INCLUDES

.1 Hardware for hollow and insulated steel doors.

.2 Thresholds

.3 Weatherstripping, seals, and door gaskets.

1.2 RELATED SECTIONS

.1 Section 08 11 00 - Metal Doors and Frames.

1.3 REFERENCES

.1 American National Standards Institute (ANSI).

.1 ANSI/BHMA A156.1-2006, American National Standard for Butts and Hinges.
.2 ANSI/BHMA A156.2-2003, Bored and Preassembled Locks and Latches.
.3 ANSI/BHMA A156.4-2000, Door Controls - Closers.
.4 ANSI/BHMA A156.13-2002, Mortise Locks and Latches Series 1000.
.5 ANSI/BHMA A156.18-2006, Materials and Finishes.
.6 ANSI/BHMA A156.31- 2013, Electric Strikes and Frame Mounted Actuators

.2 Canadian Steel Door and Frame Manufacturers' Association (CSDFMA).

.1 CSDFMA Canadian Metric Guide for Steel Doors and Frames (Modular Construction): standard hardware location dimensions.

.3 NBC, National Building Code of Canada (issue date listed in Section 01 41 00 - Regulatory Requirements).

1.4 SUBMITTALS

.1 Submittals in accordance with Section 01 33 00: Submission procedures.

.2 Samples:

.1 Provide hardware samples requested by Departmental Representative.
.2 Identify each sample by label indicating applicable specification paragraph number, brand name and number, finish and hardware package number.

.3 Shop Drawings:

.1 Provide product data sheets to describe fully to Departmental Representative all products of this Section.
.2 Include descriptions of materials, composition, cautions, installation requirements.

□

1.5 SUBMITTALS AT PROJECT CLOSEOUT

.1 Submittals in accordance with Section 01 78 10: Submission procedures.

.2 Maintenance Data: Include data on operating hardware, lubrication requirements, and inspection procedures related to preventative maintenance.

.3 Special tools:

.1 Provide 2 sets of wrenches for each type of door closer and lock set installed, for project maintenance use.

.2 At completion of installations and adjustments turn over to Departmental Representative all tools supplied by hardware manufacturers with hardware items installed for later use in hardware maintenance. Seal tools together with respective hardware data/installation sheets supplied with hardware in clear plastic bags.

1.6 QUALITY ASSURANCE

.1 Manufacturer Qualifications: Company specializing in manufacturing the Products specified in this section with minimum 10 years documented experience.

.2 Regulatory Requirements:

.1 Hardware for doors in fire separations and exit doors certified by a Canadian Certification organization accredited by Standards Council of Canada.

1.7 DELIVERY, STORAGE, AND PROTECTION

.1 Deliver, store and handle materials in accordance with respective material manufacturer's requirements.

.2 Package each item of hardware including fastenings, separately or in like groups of hardware, label each package as to item definition and location.

.3 Store door hardware in locked, clean and dry area.

.4 Include hardware templates and full installation/adjustment information.

.5 Supply hardware complete with all factory supplied mounting fasteners required for installation.

.6 Replace defective or damaged materials with new.

1.8 WASTE DISPOSAL AND MANAGEMENT

.1 Separate and recycle waste materials in accordance with Section 01 74 19 - Construction Waste Management and Disposal.

1.9 WARRANTY

.1 For Work of this Section 08 71 00 - Door Hardware, 12 months warranty period is extended to:

.1 60 months for door closers of this Section will be free from manufacturing defects.

.2 Manufacturing defects will be deemed to occur if any of following conditions are noted.

.1 Defects of material and factory workmanship.

.2 Fluids leaks.

.2 Defective products to be corrected, replaced or maintained without cost to Canada as necessary to enable such products to perform as warranted.

.3 Start warranties at date of Final Certificate of Completion.

Part 2 Products

2.1 MANUFACTURERS

.1 Hardware items to be of the best grade, free from defect and of first line quality production suitable for this level of project.

.2 Use one hardware manufacturer product only for each similar hardware item.

.3 Acceptable manufacturers:

.1 Hinges: McKinney, Stanley, Ives.

.2 Locks: Schlage, Sargent, Corbin/Russwin.

.3 Closers: LCN, Sargent, Corbin/Russwin.

.4 Exit Device: Von Duprin, Sargent, Corbin/Russwin

.5 Door stops, Overhead: Glynn Johnson, Sargent, Corbin/Russwin.

.6 Other wall and floor stops: CBH, Gallery, Ives

.7 Thresholds and weatherstrip: Draft Seal, Pemko, National

.8 Pocket track: Kris Track, de Jong, K N Crowder

.9 Pocket Lock: KN Krowder, Baldwin, Emtek

.10 Electric strikes/power supply: Von Duprin, Sargent, RCI.

2.2 HARDWARE - GENERAL

.1 General: Refer to paragraph. **3.6 Hardware Schedule** for further description and finishes of following items.

.2 Locks and latches:

.1 Mortise locks and latches: to ANSI/BHMA A156.13, series 1000 mortise lock, grade 1, designed for functions scheduled and keyed as stated in Hardware Schedule.

.2 Lever handles, Plain design

.3 Escutcheons: round.

.4 Normal strikes: box type, lip projection not beyond jamb.

.5 Cylinders: keyed into keying system directed by Departmental Representative.

□

.6 Finishes: finished to 626

.3 Butts and hinges:

.1 Butts: to ANSI/BHMA A156.1, 5-knuckle, sizes x finishes scheduled, concealed bearing for scheduled doors, NRP for scheduled doors.

.4 Exit devices: to ANSI/BHMA A156.3 and as scheduled.

.5 Door closers and accessories:

.1 Door controls (closers): to ANSI/BHMA A156.4, designated by letter C, sizes as required by NBC and to provide following requirements.

.2 Maximum degree of opening required.

.3 Size to door.

.6 Architectural door trim: to ANSI/BHMA A156.6, designated by letter J and as scheduled.

.1 Door protection plates: Kick plate type1.27 mm thick stainless steel finish to 630

.2 Push plates: 1.27 mm thick finished to 630

.3 Pull units: stainless steel finished to 630

.7 Thresholds: 127 mm wide x full width of door opening, extruded aluminum mill finish, serrated surface.

.8 Weatherstripping:

.1 Head and Jamb seal:

.1 Extruded aluminum frame and solid closed cell nepoprene insert, clear anodized finish.

.2 Adhesive backed neoprene material

.2 Door bottom seal:

.1 Extruded aluminum frame with closed cell neoprene, vinyl sweep, clear anodized finish.

2.3 KEYING

.1 Obtain final keying from Departmental Representative before ordering.

.2 Prepare keying schedule in co-operation with Departmental Representative.

.3 Supply keys in duplicate for every lock in this contract.

.4 Supply 3 master keys for each master key or grand master key group.

.5 Stamp Keying code numbers on keys and cylinders.

.6 Supply construction cores

.7 Use a bonded locksmith for all keying work. Stamp all keys "Do Not Copy".

□

2.4 FINISHES

.1 Finishes: Stainless steel 630.

Part 3 Execution

3.1 EXAMINATION

.1 Verify that doors and frames are ready to receive work and dimensions are as indicated on shop drawings.

3.2 FASTENINGS

.1 Use only fasteners provided by manufacturer. Failure to comply may void warranties and applicable licensed labels.

.2 Supply screws, bolts, expansion shields and other fastening devices required for satisfactory installation and operation of hardware.

.3 Exposed fastening devices to match finish of hardware.

.4 Where pull is scheduled on one side of door and push plate on other side, supply fastening devices, and install so pull can be secured through door from reverse side. Install push plate to cover fasteners.

.5 Use fasteners compatible with material through which they pass.

3.3 INSTALLATION

.1 Install hardware in accordance with manufacturer's instructions.

.2 Install hardware to standard hardware location dimensions in accordance with Canadian Metric Guide for Steel Doors and Frames (Modular Construction) prepared by Canadian Steel Door and Frame Manufacturers' Association.

.3 Use templates provided by hardware item manufacturer.

.4 Use only manufacturer supplied fasteners. Failure to comply may void manufacturer warranties and applicable licensed labels. Use of "quick" type fasteners, unless specifically supplied by manufacturer, is unacceptable.

.5 Provide metal door and frame manufacturers with complete instructions and templates for preparation of their work to receive hardware.

.6 Remove construction locks when directed by the Departmental Representative.

.1 Install permanent cores and ensure locks operate correctly

3.4 ADJUSTING

.1 Adjust hardware for smooth operation.

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3.5 PROTECTION OF FINISHED WORK

.1 Do not permit adjacent work to damage hardware or finish.

3.6 CLEANING

.1 Do cleaning in accordance with Section 01 74 11 - Cleaning.

.2 Perform cleaning after installation to remove construction and accumulated environmental dirt.

.3 Clean hardware with damp rag and approved non-abrasive cleaner, and polish hardware in accordance with manufacturer instructions.

3.7 HARDWARE SCHEDULE

.1 Hinges

.1 A1–Hinge5Knuckle-.180gauge-114mmx101mmx NonRemovablePinx630

.2 A2 – Hinge 5 Knuckle-.134 gauge- 114mm x 101mm x Non Removable Pin x 652

.2 Locks, Deadbolts and Privacy

.1	B1 – Cylinder	Type x length x cam to suit	626
.2	B2 - Privacy set	ANSI F22 with indicator	626
.3	B3 - Lock set	ANSI F09	626
.4	B4- Lock set	ANSI F07	626
.5	B5- Passage set	ANSI F75	626
.6	B6-Classroom lock	ANSI F05	626
.7	B7- Electric strike	BHMA Grade 1	626
.8	B8- Deadbolt	cylinder only	626

.3 Closers

.1 C1 Institutional, non sized, compression spring buffer arm x delayed action 689.

.2 Include through bolts and grommet nut fasteners

.4 Auxilliary hardware

.1 D1-Kick Plate 1.27 mm thickness x 254mm height x width less 38mm X 630

.2 D2 - Wall stop Cast concealed mount, concave bumper with back plate x 626

.3 D3-Over Head stop Surface mount, single acting, non handed with slide track for medium traffic and weight doors

.4 D4- Push plates, push/pull units.

.5 Threshold , seals door bottoms, astragal:

.1 E1- Thresholds: as scheduled, one length per door opening without joins or splices.

.2 E2- Weatherstripping/Seals: Adjustable jamb type with silicone insert.

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.3 E3-Astragal: overlapping, extruded aluminum, neoprene weather seal, finished to match doors.

.4 E4 –Flush bolts

Hardware Set 01 for Exterior double doors 1

6 Hinges	A1
1 Ea. Passage set	B5
1 Deadbolt	B8

Cylinder on inside of active door, blank plate outside

1 Ea. Closer	C1
1 Ea. Kick Plate	D1
1 Threshold	E1
1 Ea. Weatherstripping	E2
1 Astrigal	E3
2 Flush bolts	E4

Hardware Set 02 for cooler door 2

Door hardware by door manufacturer to include:
1 Latching exterior handle
1 Interior safety release

Hardware Set 03 for Exterior single door 3

3 Hinges	A1
1 Ea. Lock set	B3
1 Ea. cylinder	B1
1 Ea. Closer	C1
1 Ea. Kick Plate	D1
1 Ea. Threshold	E1
1 Ea. Weatherstripping	E2
1 Ea. Deadbolt	B8

Hardware Set 04 Corridor doors 4

3 Hinges	A2
1 Ea. Closer	C1
2 Ea. Kick plate	D1
1 Ea. Passage set	B5

Hardware set 05 Door 5

3 Hinges	A2
1 Ea. Kick plate	D1
1 Ea. Door stop	D2
1 Ea. Passage set	B5

END OF SECTION

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PART 1 GENERAL

1.1 SECTION INCLUDES

.1 Gypsum board and joint treatment.

.2 Metal stud wall framing.

.3 Rubber Base

1.2 RELATED SECTIONS

.1 Section 09 90 00 - Painting and Coating.

1.3 REFERENCES

.1 ASTM C475/C475M-12 - Standard Specification for Joint Compound and Joint Tape for Finishing Gypsum Board.

.2 ASTM C645-11a - Standard Specification for Nonstructural Steel Framing Members.

.3 ASTM C754-11 - Standard Specification for Installation of Steel Framing Members to Receive Screw-Attached Gypsum Panel Products.

.4 ASTM C1002-07 - Standard Specification for Steel Self-Piercing Tapping Screws for the Application of Gypsum Panel Products or Metal Plaster Bases to Wood Studs or Steel Studs.

.5 ASTM C1396/C1396M-09a, Standard Specification for Gypsum Wallboard.

.6 Gypsum Association GA-214-10 - Recommended Levels of Gypsum Board Finish.

.7 ASTM E119 - Standard Test Methods for Fire Tests of Building Construction and Materials.

1.4 REGULATORY REQUIREMENTS

.1 Conform to applicable code for fire rated assemblies.

.1 Fire Rated Partitions: Listed assembly by ULC .

1.5

PART 2 PRODUCTS

2.1 FRAMING MATERIALS

.1 Studs and Tracks: ASTM C645; galvanized sheet steel, 0.91 mm thick, C shape, with knurled faces.

.2 Slip joint head track: 0.91 thick, galvanized sheet steel, 50 mm deep.

.3 Fasteners: ASTM C1002.

.4 Anchorage to Substrate: Tie wire, nails, screws, and other metal supports, of type and size to suit application; to rigidly secure materials in place.

2.2 GYPSUM BOARD MATERIALS

.1 Standard Gypsum Board: ASTM C1396; 16 mm thick, Type X, maximum available length in place; ends square cut, tapered edges.

.2 Fire rated gypsum board: to ASTM C1396/C1396M Type X, thicknesses detailed/indicated on drawings x widths to suit framing centres x maximum practical lengths, wrapped tapered edges, square cut ends, bearing ULC fire rating labels.

.1 Paper facing: no less than 75% recycled.

.2 Gypsum core: no less than 10% recycled content.

2.3 ACCESSORIES

.1 Corner Beads: 0.45 mm thick, galvanized sheet steel, paper faced; tapable

.2 Edge Trim: GA-201 and GA-216; Galvanized steel or rigid vinyl with 'J' type bead, tapable.

.3 Joint Materials: ASTM C475; reinforcing tape, joint compound, adhesive, and water.

.4 Fasteners: ASTM C1002

2.4 ACCESS PANELS

.1 Proprietary access panels consisting of a GWB face housed in an aluminum framework.

.1 Mounting frame bedded into GWB joint material.

.2 Concealed hardware (frame, latch and hinge).

.3 Removable door panel with safety cable.

.4 Sized as indicated in mechanical specification and drawings.

PART 3 EXECUTION

3.1 METAL STUD INSTALLATION

.1 Install studs in accordance with ASTM C754 Metal Stud Spacing: 400mm on center.

.2 Install slip joint head track where stud walls meet structure. Allow for 40 mm deflection.

.3 Coordinate installation of bucks, anchors, blocking, electrical and mechanical work placed in or behind partition framing.

3.2 GYPSUM BOARD INSTALLATION

.1 Install gypsum board in accordance with manufacturer's instructions.

.2 Erect single layer standard gypsum board horizontally with ends and edges occurring over firm bearing.

.3 Use screws when fastening gypsum board to metal furring or framing.

.4 Place corner beads at external corners. Use longest practical length. Place edge trim where gypsum board abuts dissimilar materials.

.1 Install edge trim in all areas where the GWB abuts the exterior wall and ceiling panels.

.2 Metal trims are supplied in areas where the interior walls abut structural posts.

.5 Install gypsum board to underside of the interior of the structure.

3.3 JOINT TREATMENT

.1 Tape, fill, and sand exposed joints, edges, and corners three coats minimum to produce smooth surface ready to receive finishes.

.2 Feather coats on to adjoining surfaces so that camber is maximum 0.8 mm.

3.4 ACCESS PANELS

.1 Install access panels where indicated

3.5 TOLERANCES

.1 Maximum Variation of Finished Gypsum Board Surface from True Flatness: 3 mm in 3 m in any direction.

3.6 CLEANING

.1 Do cleaning in accordance with Section 01 74 11 - Cleaning.

.2 Dispose of waste materials in accordance with Section 017419 - Const. Waste Management And Disposal.

.3 Dispose of excess GWB at the appropriate waste management facility

END OF SECTION

Part 1 General

1.1 REFERENCES

.1 ASTM E84-12c - Standard Test Method for Surface Burning Characteristics of Building Materials.

.2 ASTM F1861-08(2012)e1 - Standard Specification for Resilient Wall Base.

.3 ASTM F1860-14e1 - Standard Specification for Rubber Sheet Floor Covering With Backing.

.4 CAN/ULC-S102.2-10 - Standard Method of Test for Surface Burning Characteristics of Flooring, Floor Coverings and Miscellaneous Materials and Assemblies.

.5 Green Guard Environmental Institute

.1 Greenguard Certification

.6 South Coast Air Quality Management District (SCAQMD), California State

.1 SCAQMD Rule 1168-05, Adhesives and Sealants Applications.

1.2 SUBMITTALS FOR REVIEW

.1 Section 01 33 00: Submission procedures.

.2 Submit Workplace hazardous materials information system (WHIMS) Material Safety Data Sheets (MSDS)

.1 Indicate precautions for workers when handling flooring preparation and installation products.

.2 Indicate VOC content of flooring preparation and installation products.

.3 Product Data: Provide data on specified products, describing performance, physical characteristics, sizes, patterns and colours available.

.4 Shop Drawings: Indicate seaming plan.

.5 Samples:

.1 Submit two (2) samples of manufacturer's standard colour range, one (1) to Departmental Representative and one (1) to Consultant, for colour selection.

CLOSEOUT SUBMITTALS

.6 Section 01 78 00: Submission procedures.

.7 Operation and Maintenance Data: Include maintenance procedures, recommended maintenance materials, and suggested schedule for cleaning, stripping, and re-waxing.

1.3 MAINTENANCE MATERIAL SUBMITTALS

.1 Section 01 78 00: Maintenance and extra material requirements.

.2 Extra Stock Materials: Provide 5 sq.m of flooring, 15 lin m of base material specified.

1.4 QUALITY ASSURANCE

.1 Installer Qualifications: Company specializing in performing the work of this section with minimum three (3) years documented.

1.5 DELIVERY, STORAGE, AND PROTECTION

.1 Transport, handle, store, and protect products. In accordance with manufacturers specifications

.2 Protect roll materials from damage by storing on end.

1.6 ENVIRONMENTAL REQUIREMENTS

.1 Store materials for three (3) days prior to installation in area of installation to achieve temperature stability.

.2 Maintain ambient temperature required by adhesive manufacturer three (3) days prior to, during, and twenty-four (24) hours after installation of materials.

1.7 WARRANTY

.1 Provide flooring manufacturers 5 year written material warranty against excessive wear under normal usage.

.2 Warranties to start at date of substantial completion.

Part 2 Products

2.1 MATERIALS - SHEET FLOORING

.1 Rubber Flooring to ASTM F1860:

.1 Description: pre-fabricated rubber flooring; calendered and vulcanized with natural and synthetic rubber base, stabilizing agents and pigmentation, manufactured in 2 layers vulcanized together, shore hardness of top layer greater than that of bottom layer.

.2 Surface: smooth, permanent no-wax finish.

.3 Appearance: solid background colours with random marbleized pattern throughout wear layer.

.4 Thickness; Not less than 3 mm

.5 Colour: to be selected from manufacturers standard colour range.

.6 Flooring systems installed in the building interior shall meet the requirements of the following standards

.1 Green Guard Certification

.2 SCAQMD 1168

2.2 MATERIALS - BASE

.1 Base: ASTM F1861, Type TV thermoplastic rubber; coved profile; top set; premoulded end stops and external corners:

.1 Thickness: minimum 3 mm.

.2 Heights: 102 mm, unless noted otherwise.

.3 Lengths: roll.

.4 Colours: selected by Departmental Representative from standard colour range.

2.3 ACCESSORIES

.1 Subfloor Filler: White premix latex; type recommended by adhesive material manufacturer.

.2 Primers and Adhesives: Waterproof; types recommended by flooring manufacturer.

.1 Adhesives to SCAQMD Rule 1168-05, Adhesives and Sealants Applications.

.3 Edge Strips: Metal.

.4 Adhesives: solvent-free waterproof types recommended by respective flooring manufacturer to suit each flooring material and each application condition, with low emission and odour levels.

.5 Joint sealing/welding material: purpose-made welding thread (rod) of type recommended by respective flooring manufacturers to suit application, colours to match flooring.

Part 3 Execution

3.1 EXAMINATION

.1 Verify floor and lower wall surfaces are free of substances that may impair adhesion of new adhesive and finish materials.

3.2 PREPARATION

.1 Remove sub-floor ridges and bumps. Fill minor or local low spots, cracks, joints, holes, and other defects with sub-floor filler to achieve smooth, flat, hard surface.

.2 Prohibit traffic until filler is cured.

.3 Ensure wall to receive base is smooth, level, free from waves and other defects, and ready for base installation, refer to section 09 21 16 – Gypsum Board Assemblies.

.4 Vacuum clean substrate.

3.3 INSTALLATION - SHEET FLOORING

.1 Install sheet flooring to manufacturers written instructions.

.2 Spread only enough adhesive to permit installation of materials before initial set.

.3 Set flooring in place, press with heavy roller to attain full adhesion.

.4 Lay flooring with joints and seams to produce minimum number of seams.

.5 Install sheet flooring parallel to length of room. Provide minimum of one third (1/3) full roll width. Double cut sheet; provide butt joint.

.6 Seal joints of sheet flooring, including self-coved bases, using welding thread (rod). Form joints uniform in width, appearance and as inconspicuous as possible. Form joints flush, well adhered in place, watertight and free of peaking or projections.

.7 Terminate flooring at centreline of door openings where floor finish is dissimilar.

.8 Install edge strips at unprotected or exposed edges, and where flooring terminates.

.1 Secure metal strips after installation of flooring with stainless steel screws.

.9 Scribe flooring to walls, columns, cabinets, floor outlets, and other appurtenances to produce tight joints.

.10 Clean and seal in accordance with manufacturers recommendations when installation complete.

3.4 INSTALLATION - BASE

.1 Fit joints tight and vertical. Maintain minimum measurement of 450 mm between joints.

.2 Mitre internal corners. At external corners and exposed ends, use premoulded units.

.3 Install base in full bed of adhesive using full spread notched trowel. Cut and fit base neatly at corners, to tight fitting tolerances.

.4 Install base straight and level to maximum variation of 1:1000.

.5 Install base on toe kick of cabinets which occur in rooms and areas where resilient flooring is scheduled.

.6 Scribe and fit to door frames and other interruptions.

.7 Keep joints tight and well fitted.

3.5 CLEANING

.1 Do cleaning in accordance with Section 01 74 11 - Cleaning.

.2 Clean installed work.

.3 Remove access adhesive from floor, base, and wall surfaces without damage.

.4 Clean and seal floor in accordance with manufacturers written instructions.

3.6 PROTECTION OF FINISHED WORK

.1 Prohibit traffic on floor finish for forty-eight (48) hours after installation.

END OF SECTION

Part 1 General

1.1 RELATED SECTIONS

.1 Section 08 11 00- Metal Doors and Frames

.2 Section 09 21 18 – Gypsum Board Assemblies

1.2 REFERENCES

.1 Health Canada / Workplace Hazardous Materials Information System (WHMIS)

- .1 Material Safety Data Sheets (MSDS).

.2 Master Painters Institute (MPI)

- .1 MPI Architectural Painting Specifications Manual, 2004.

.3 National Fire Code of Canada – 1995

.4 Green Seal Environmental Standards

- .1 Standard GC-03-97, Anti-Corrosive Paints.
- .2 Standard GS-11-93, Architectural Paints.
- .3 Standard GS-36-00, Commercial Adhesives

.5 South Coast Air Quality Management District (SCAQMD), California State

- .1 SCAQMD Rule 1113-04, Architectural Coatings.
- .2 SCAQMD Rule 1168-05, Adhesives and Sealants Applications.

.6

1.3 SUBMITTALS

.1 Submittals in accordance with Section 01 33 00 - Submittal Procedures.

.2 Product Data:

- .1 Submit product data and instructions for each paint and coating product to be used.
- .2 Submit product data for the use and application of paint thinner.
- .3 Submit copies of Workplace Hazardous Materials Information System (WHMIS) Material Safety Data Sheets (MSDS) in accordance with Section 01 33 00 - Submittal Procedures. Indicate VOCs during application.

.3 Samples:

- .1 Submit duplicate 200 x 300 mm draw down samples of each scheduled paint colour with specified paint colours, gloss/sheen and textures required to MPI Architectural Painting Specification Manual standards.
- .2 Retain reviewed samples on-site to demonstrate acceptable standard of quality for appropriate on-site surface.
- .3 Manufacturer's Instructions:
  - .1 Submit manufacturer's installation application instructions.

.4 Closeout Submittals: submit maintenance data for incorporation into manual specified in Section 01 78 00 - Closeout Submittals include following:

.1 Product name, type and use.

.2 Manufacturer's product number.

.3 Colour numbers and information necessary for re ordering paint.

1.4 DELIVERY, STORAGE AND HANDLING

.1 Packing, Shipping, Handling and Unloading:

.1 Pack, ship, handle and unload materials in accordance with Section 01 61 00 - Common Product Requirements and manufacturer's written instructions.

.2 Acceptance at Site:

.1 Identify products and materials with labels indicating:

.1 Manufacturer's name and address.

.2 Type of paint or coating.

.3 Compliance with applicable standard.

.4 Colour number in accordance with established colour schedule.

.3 Remove damaged, opened and rejected materials from site.

.4 Storage and Protection:

.1 Provide and maintain dry, temperature controlled, secure storage.

.2 Store materials and supplies away from heat generating devices.

.3 Store materials and equipment in well ventilated area.

.5 Store temperature sensitive products above minimum temperature as recommended by manufacturer.

.6 Keep areas used for storage, cleaning and preparation clean and orderly. After completion of operations, return areas to clean condition.

.7 Remove paint materials from storage only in quantities required for same day use.

.8 Handle, store, use and dispose of flammable and combustible materials in accordance with National Fire Code of Canada requirements.

1.5 Waste Management and Disposal:

.1 Separate waste materials for recycling in accordance with Section 01 74 19 - Construction/Demolition Waste Management and Disposal.

.2 Remove from site and dispose of packaging materials at appropriate recycling facilities.

.3 Unused coating materials must be disposed of at official hazardous material collections site as approved by Departmental Representative.

1.6 SITE CONDITIONS

.1 Surface and Environmental Conditions:

.1 Apply paint finish in areas where dust is no longer being generated by related construction operations or when wind or ventilation conditions are such that airborne particles will not affect quality of finished surface.

.2 Apply paint to adequately prepared surfaces and to surfaces within moisture limits.

.3 Apply paint when previous coat of paint is dry or adequately cured.

.2 Additional interior application requirements:

.1 Apply paint finishes when temperature at location of installation can be satisfactorily maintained within manufacturer's recommendations.

Part 2 Products

2.1 MATERIALS

.1 Paint materials listed in the MPI Approved Products List (APL) are acceptable for use on this project.

.2 Provide paint materials for paint systems from single manufacturer.

.3 Conform to latest MPI requirements for interior and exterior painting work including preparation and priming.

.4 Materials (primers, paints, coatings, varnishes, stains, lacquers, fillers, thinners, solvents, etc.) in accordance with MPI Architectural Painting Specification Manual "Approved Product" listing.

.5 Linseed oil, shellac, and turpentine: highest quality product from approved manufacturer listed in MPI Architectural Painting Specification Manual, compatible with other coating materials as required

.6 Paint materials to conform to the requirements of :

.1 Green Seal Environmental Standards

.1 Standard GS-11-93, Architectural Paints.

.2 South Coast Air Quality Management District (SCAQMD), California State

.1 SCAQMD Rule 1113-04, Architectural Coatings.

2.2 COLOURS

.1 Departmental Representative to provide interior colour schedule after Contract award

.2 Selection of colours from manufacturers full range of colours.

.3 Where specific products are available in restricted range of colours, selection based on limited range.

2.3 GLOSS/SHEEN RATINGS

.1 Paint gloss is defined as sheen rating of applied paint, in accordance with following values:

	Gloss @ 60 degrees	Sheen @ 85 degrees
Gloss Level 1 - Matte Finish (flat)	Max. 5	Max. 10

Gloss Level 2 - Velvet-Like Finish	Max.10	10 to 35
Gloss Level 3 - Eggshell Finish	10 to 25	10 to 35
Gloss Level 4 - Satin-Like Finish	20 to 35	min. 35
Gloss Level 5 - Traditional Semi-Gloss Finish	35 to 70	
Gloss Level 6 - Traditional Gloss	70 to 85	
Gloss Level 7 - High Gloss Finish	More than 85	

2.4 PAINTING SYSTEMS

.1 Galvanized metal: Interior doors and frames

.1 INT 5.3M - High performance architectural latex G3 gloss level finish.

.2 Galvanized metal: Exterior doors and frames.

.1 EXT 5.3J- W.B.Light industrial coating: G5 gloss level finish

.3 Plaster and gypsum board: gypsum wallboard, drywall, "sheet rock type material", and textured finishes:

.1 INT 9.2M – Institutional low odor/low VOC; G3 gloss level finish (over latex sealer).

Part 3 Execution

3.1 MANUFACTURER'S INSTRUCTIONS

.1 Compliance: comply with manufacturer's written recommendations or specifications, including product technical bulletins, handling, storage and installation instructions, and data sheet.

3.2 GENERAL

.1 Perform preparation and operations for interior painting in accordance with MPI Architectural Painting Specifications Manual except where specified otherwise.

.2 Apply paint materials in accordance with paint manufacturer's written application instructions.

3.3 EXAMINATION

.1 Investigate existing substrates for problems related to proper and complete preparation of surfaces to be painted. Report to Departmental Representative damages, defects, unsatisfactory or unfavourable conditions before proceeding with work.

3.4 PREPARATION

.1 Protection:

.1 Protect existing building surfaces and adjacent structures from paint spatters, markings and other damage by suitable non-staining covers or masking. If damaged, clean and restore surfaces as directed by Departmental Representative

.2 Protect items that are permanently attached such as Fire Labels on doors and frames.

.3 Protect factory finished products and equipment.

.4 Protect building occupants and general public in and about the building.

.2 Surface preparation: clean and prepare surfaces in accordance with MPI Architectural Painting Specification Manual requirements. Refer to MPI Manual in regard to specific requirements

.3 Sand and dust between coats as required to provide adequate adhesion for next coat and to remove defects visible from a distance up to 1000 mm.

.4 Clean metal surfaces to be painted by removing rust, loose mill scale, welding slag, dirt, oil, grease and other foreign substances in accordance with MPI requirements. Touch up of shop primers with primer as specified.

3.5 APPLICATION

.1 Conform to manufacturer's application instructions unless specified otherwise.

.2 Brush and Roller Application:

.1 Apply paint in uniform layer using brush and/or roller type suitable for application.

.2 Work paint into cracks, crevices and corners.

.3 Paint surfaces and corners not accessible to brush using spray, daubers and/or sheepskins. Paint surfaces and corners not accessible to roller using brush, daubers or sheepskins.

.4 Brush and/or roll out runs and sags, and over-lap marks. Rolled surfaces free of roller tracking and heavy stipple.

.5 Remove runs, sags and brush marks from finished work and repaint.

.3 Spray application:

.1 Provide and maintain equipment that is suitable for intended purpose, capable of atomizing paint to be applied, and equipped with suitable pressure regulators and gauges.

.2 Keep paint ingredients properly mixed in containers during paint application either by continuous mechanical agitation or by intermittent agitation as frequently as necessary.

.3 Apply paint in uniform layer, with overlapping at edges of spray pattern. Back roll first coat application.

.4 Brush out immediately all runs and sags.

.5 Use brushes and rollers to work paint into cracks, crevices and places which are not adequately painted by spray.

.4 Use dipping, sheepskins or daubers only when no other method is practical in places of difficult access.

.5 Apply coats of paint continuous film of uniform thickness. Repaint thin spots or bare areas before next coat of paint is applied.

.6 Allow surfaces to dry and properly cure after cleaning and between subsequent coats for minimum time period as recommended by manufacturer.

.7 Sand and dust between coats to remove visible defects.

.8 Finish surfaces both above and below sight lines as specified for surrounding surfaces, including such surfaces as tops of interior cupboards and cabinets and projecting ledges.

3.6 SITE TOLERANCES

.1 Walls: no defects visible from a distance of 1000 mm at 90 degrees to surface.

.2 Ceilings: no defects visible from floor at 45 degrees to surface when viewed using final lighting source.

.3 Final coat to exhibit uniformity of colour and uniformity of sheen across full surface area.

3.7 CLEANING

.1 Do cleaning in accordance with Section 01 74 11 - Cleaning.

END OF SECTION

Part 1 General

1.1 REFERENCES

.1 Canadian Standards Association (CSA International)

.1 CSA-G40.20-04/G40.21-04, General Requirements for Rolled or Welded Structural Quality Steel/Structural Quality Steel.

.2 ASTM International

.1 ASTM B650 Standard Specification for Electrodeposited Engineering Chromium Coatings on Ferrous Substrates.

1.2 ACTION AND INFORMATIONAL SUBMITTALS

.1 Provide submittals in accordance with Section 01 33 00 - Submittal Procedures.

.2 Submit shop drawings:

.1 Indicate shelving layouts, number of bays, number of shelves.

.2 Submit manufacturers cut sheets for proposed shelving units.

.3 Submit manufacturer's installation instructions and installation sequence.

1.3 DELIVERY, STORAGE AND HANDLING

.1 Packing, shipping, handling and unloading:

.1 Deliver, store and handle materials in accordance with Section 01 61 00 - Common Product Requirements.

.2 Waste Management and Disposal:

.1 Separate waste materials for recycling in accordance with Section 01 74 19 – Construction Waste Management and Disposal.

1.4 EXTRA MATERIALS

.1 Provide any specialty tools for assembly and disassembly, as required by metal storage shelving manufacturer.

Part 2 Products

2.1 MATERIALS

.1 Chrome wire knock down, free standing, shelving consisting of wire shelves with wire truss front, side, and back rails to provide support.

.1 Shelves supported from four chrome plated steel corner posts.

.2 Shelves adjustable in 26mm increments.

.3 Minimum shelf capacity; 362kg

.4 Chrome plated to ASTM B60

.2 Shelving:

.1 Sizes:

.1 2 units width: 610 mm, length: 915 mm height: 2184mm.

.2 1 unit width: 610 mm, length:1829 mm height: 2184mm.

.3 1 unit width: 610 mm, length: 915 mm height: 2184mm.

.1 Designed to make a right angle unit in combination with 1829mm unit.

2.2 COMPONENTS

.1 Uprights:

.1 Chrome plated steel tubes, plastic floor protectors, plastic closures at top

.2 Size and thickness designed to support specified total load.

.2 Shelves:

.1 Chrome plated steel wire shelves designed to support specified load.

.2 Adjustable connection to uprights.

.3 Accessories:

.1 S hook hardware to connect shelving units together at a right angle, as detailed.

2.3 FINISH

.1 Finish: Chrome plated

Part 3 Execution

3.1 MANUFACTURER'S INSTRUCTIONS

.1 Compliance: comply with manufacturer's written recommendations or specifications, including product technical bulletins, handling, storage and installation instructions, and datasheets.

3.2 INSTALLATION

.1 Install metal storage shelving in accordance with reviewed layout.

3.3 CLEANING

.1 Proceed in accordance with Section 01 74 11 - Cleaning.

END OF SECTION

PART 1 - GENERAL

1.1 RELATED SECTIONS

.1 Section 06 10 00 - Rough Carpentry: wood blocking.

1.2 DESIGN REQUIREMENTS

.1 Design blinds to following requirements:
- .1 Be designed in manner that allows wear susceptible parts to be replaceable by either user or manufacturer.
- .2 Guarantee of at least 5 years of available replacement parts following discontinuation of product manufacture.
- .3 Be accompanied by instructions for replacing or repairing worn parts, including inventory numbers for parts and procedures for ordering replacement parts.
- .4 Program that allows for the refurbishing or return of used blinds.
- .5 Designed in manner that permits effective disassembly of components in order to permit recycling of materials for which recycling markets exist.

1.4 SUBMITTALS

.1 Submittals in accordance with Section 01 33 00 - Shop Drawings, Product Data and Samples.

.2 Product data:
- .1 Submit manufacturer printed product literature, specifications and data sheets.

.3 Shop drawings:
- .1 Indicate dimensions in relation to window jambs, operator details, head anchorage details, hardware and accessories details.

.4 Samples:
- .1 Submit one representative working sample of horizontal louvre blind, if requested by Departmental Representative.
- .2 Submit duplicate samples of manufacturer standard colours for selection by Departmental Representative.
- .3 Samples will be returned after approval.

.5 Manufacturer instructions:
- .1 Submit manufacturer installation instructions.

1.6 WASTE MANAGEMENT AND DISPOSAL

.1 Separate and recycle waste materials in accordance with Section 01 74 19 - Waste Management and Disposal.

1.7 CLOSEOUT SUBMITTALS

.1 Make submissions in accordance with Section 01 78 10 - Closeout Submittals.

.2 Provide following for inclusion in Project operating and maintenance manuals:
- .1 Full identification of each type of window blind installed (i.e., model and model/series number) for later use in obtaining service and replacement parts.
- .2 Name, address and telephone numbers of installer and of local service/repair agent.

PART 2 - PRODUCTS

2.1 MATERIALS AND FABRICATION

.1 Slats: 25 mm wide, with rounded corners and rough edges removed.
- .1 Aluminum alloy, corrosion resistant spring-tempered.
- .2 Colour and finish: selected by Departmental Representative.

.2 Ladders: braided polyester yarn designed for full tilting action while retaining the same level and position of each slat. Ladders spaced not more than 150 mm from end of slats and 550 mm o.c.

.3 Headrails: one piece aluminum/steel channel with rolled edges, formed to provide sufficient strength to support blind without sagging, twisting or distorting. Metal minimum 0.50 mm thick.

.4 Bottom rails: lock seam tubular steel section, 0.36 mm thick.

.5 Bottom rail end caps: soft moulded plastic fitted snugly over ends of rails, colour to match slats.

.6 Tilt rods: steel construction.

.7 Tassels: soft moulded plastic, colour to match slats.

.8 Pulleys: designed to permit ease of operation with minimum wear to cord.

.9 Tilters: fully enclosed and lubricated, with positively locked to drum to prevent

slippage and ensure accurate timing. Use anti-friction materials for worm and gear.

.10 Cord locks: designed to provide smooth operation with feature to prevent accidental dropping of blinds.

.11 Ladder caps: designed to provide sufficient retention when snapped onto bottom rail to hold ladders in proper position.

.12 Installation brackets: end and centre type complete with safety locking caps to secure headrail and valance.

.13 Lift cords: minimum 1.98 mm dia., minimum tensile strength 689 kPa, fitted with tassels.

.14 Tilter controls: transparent wand, minimum 8 mm dia.

PART 3 - EXECUTION

3.1 MANUFACTURER INSTRUCTIONS

.1 Compliance: comply with manufacturer written data, including product technical bulletins, product catalogue installation instructions, product carton installation instructions and data sheets.

3.2 INSTALLATION

.1 Install blinds at all windows, unless detailed/indicated otherwise.

.2 Use non-corroding metal fasteners for installation, concealed in final assembly.

.3 Include centre brackets where necessary to prevent headrail deflection.

.4 Install brackets to resist pulling away and loosening.
- .1 Fix in place using screws of sufficient length to hold secure through wall finish into stud framing/blocking.
- .2 Co-ordinate wall framing to include intermediate blocking as required for attachment of components.
- .3 Direct fastening to gypsum board alone not acceptable.

.5 Adjust to provide operation without binding.

.6 Leave blinds in up position.

3.3 CLEANING

.1 Do cleaning in accordance with Section 01 74 11 - Cleaning.

.2 Remove finger marks caused during installation.

.3 On completion and verification of performance of installation, remove surplus materials, excess materials, rubbish, tools and equipment.

END OF SECTION