ECHELON CENTRE
6/F, 575 WEST 8TH AVENUE
VANCOUVER, BRITISH COLUMBIA

ISSUED FOR TENDER

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1.0 DESCRIPTION OF THE WORK

.1 The work under this contract shall generally include all labour, materials, tools, equipment and supplies necessary to carry out the complete work of Tenant Improvement at 6/F, 575 West 8th Avenue, Vancouver as shown on the drawings and called for in the specifications to provide a complete and functional facility.

.2 Without limiting the foregoing, the work shall include:

.1 Execution of work within the Tenant Design and Construction manual by Cressey Properties Corporations.
.2 Acceptance of the site prior to the commencement of Work.
.3 Connections to termination points of existing services.
.4 All architectural, mechanical, plumbing and electrical work.
.5 Commissioning.
.6 Preparation and submission of all project close out documentation.

.3 The Contractor shall be responsible for keeping his areas of work in a tidy and safe condition, and fully comply with the Tenant Work Rules and Regulations as in appendix 2 of the specifications.

.4 Obtain necessary permits and inspections from authorities having jurisdiction with the exception of the building permit which, will be supplied by the Owner.

2.0 DOCUMENTS

.1 This section of the specifications forms part of the Contract Documents and is to be read, interpreted and coordinated with all other parts.

.2 The specifications have been divided into approximate trade sections. However, the division into sections shall not operate to define or limit the responsibility of an Subcontractor.

3.0 DOCUMENTS REQUIRED

.1 Maintain at job site, one copy each of following:

.1 Contract Drawings
.2 Specifications
.3 Addenda
.4 Reviewed shop drawings
.5 Change orders
.6 Other modifications to Contract
.7 Field test reports
.8 Copies of approved and updated work schedules
.9 Manufacturers' installation and application instructions
.10 Project meeting minutes
.11 Site instructions
.12 Vancouver Building Bylaw (current edition)
.13 Record set for as built drawings
.14 Safety meeting minutes

4.0 COMPLETION TIME

.1 Refer to invitation to Tender part C-Form of Tender item 1.0.

5.0 CONTRACTOR'S USE OF SITE

.1 Comply with the Tenant Work Regulations and rules as per Appendix 2 of this specification.

.2 Do not unreasonably encumber the site with materials an equipment.

.3 Move stored products or equipment that may interfere with the base building operations as directed by the Owner or Consultant.

6.0 SETTING OUT OF WORK

.1 The Contractor shall be responsible for all field engineering and layout unless noted otherwise.

.2 Assume full responsibility for and execute complete layout of work to locations, lines and elevations indicated.

.3 Provide devices needed to lay out and construct work.

7.0 LOCATION OF EQUIPMENT AND FIXTURES

.1 Location of equipment, fixtures and outlets indicated or specified are to be considered as approximate.

.2 Locate equipment, fixtures and distribution systems to provide minimum interference and maximum useable space and in accordance with manufacturer's recommendations for safety, access and maintenance.

.3 Inform the Consultant of impending installation and obtain his approval for actual location.

.4 Submit field drawings to indicate relative position of various services and equipment when required by the Consultant.

8.0 ALTERATIONS, ADDITIONS OR REPAIRS TO EXISTING BUILDINGS

.1 Execute work with the least possible inference or disturbance to occupants, public and normal use of premises. Arrange with Owner to facilitate execution of work. Provide temporary controls as required.

9.0 ADDITIONAL DRAWINGS

.1 The Consultant 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.

10.0 ASBESTOS DISCOVERY

.1 Demolition of spray or trowel-applied asbestos can be hazardous to health. Should material resembling spray or trowel-applied asbestos be encountered in the course of demolition work, stop work and notify the Owner and Consultant immediately. Do not proceed until written instructions have been received from the Owner and Consultant.

.2 Asbestos containing gypsum wall board ceiling around the perimeter of the building core will be removed by the Building Owner.

11.0 REMOVED MATERIAL

.1 Unless expressly stated otherwise in writing by the Consultant, materials indicated for removal become the Contractor's property and shall be removed from the site.

.2 Do not dispose of volatile or corrosive materials in drains.

12.0 BUILDING SMOKING ENVIRONMENT

.1 No smoking is allowed within the whole building.

13.0 COORDINATION AND COOPERATION

.1 The Contractor shall coordinate the work with his Subcontractors with efficient and continuous supervision and be fully aware of the Work requirements including, without limitation, those of the specifications and drawings.

.2 The responsibility as to which Subcontractor provides required work to be built-in or supplied rests entirely with the Contractor. Differences in interpretation of the specifications or drawings as to which Subcontractor shall provide certain work shall not be grounds for claims for extras.

.3 The Contractor shall coordinate the use of the construction plant and equipment and access, with the work of the various Subcontractors. The cost of such use by the various Subcontractors are subject to whatever arrangement exists between the Contractor and the various Subcontractors.

14.0 DAILY RECORD

.1 From the day of commencement of the Work, the Contractor shall maintain an accurate daily record of the progress of the Work on his standard record form, with applicable trades listed. This record shall be open to the Consultant's and the Owner's inspections at all reasonable times. A copy of the record shall be turned over to the Consultant at weekly intervals.

.2 Contractor's diary shall record all pertinent data such as:
- .1 Commencements, progress and completion of various portions of the Work.
- .2 Dates of all Site meetings.
- .3 Dates of visits or inspections by government authorities, inspectors, and any other visitors to the Site.
- .4 Record of work force employed.
- .5 Man power on site by trade supplier each day.

15.0 PERMITS AND FEES

.1 The Owner will apply and pay for the Building Permits. The Contractor shall obtain and pay for all other trades permits and licenses required for the Work.

.2 The Contractor shall conform to the codes, ordinances, regulations and orders of all authorities having jurisdiction over the performance of the Work. Should conflicts arise, the Contractor shall forthwith request clarification from the Consultant.

16.0 HOURS OF WORK

.1 Refer to Appendix 2 Tenant Work Rules and Regulations

17.0 SIGNS

.1 Signs or advertising shall not be placed on the Site without the written approval of the Owner. The Contractor shall be responsible for regulating all signage on the site in accordance with the requirements of the Owner.

18.0 PUBLICITY

.1 All publicity relating to this Project and the Work is subject to the prior approval of the Owner, and no mention of the Project in advertising or articles in any publication will be permitted unless previously approved by the Owner. Publicity or advertising implying endorsement of a product by the Owner will not be permitted.

19.0 WORK AREA

.1 The Site upon which the Work is to be conducted is shown on the drawings. The Work and the, storage of equipment, materials and/or supplies must be contained within the Site area.

20.0 CONSTRUCTION SAFETY

.1 The Contractor shall comply with the Workers' Compensation Accident Prevention Regulations of British Columbia (latest edition in force) and provide all necessary safety requirements as prescribed by such regulations. Also refer to Appendix G Brookfield GIS WSI Contractor Health, Safety and Environmental Policy Handbook under the Stipulated Price Bid Document.

21.0 SECURITY

.1 The Contractor shall be responsible for security of the Work.

.2 The Contractor and his Subcontractors shall make their own arrangements to ensure the security of their own equipment and materials.

.3 The Owner will not be liable for any loss or damage to materials, equipment or other property of the Contractor.

22.0 NOISE ABATEMENT

.1 The Contractor shall comply with the requirements of the Tenant Work Rules and Regulations as per Appendix 4 regarding noise abatement and take all necessary steps to ensure the generation and transmission of noise and vibration due to the Work are kept to a minimum as required.

.2 Any noise or vibration which is found to be objectionable shall be corrected, at no additional cost to the Owner and to the satisfaction of the City and/or the Owner and the Consultant.

23.0 PRECONSTRUCTION MEETING

.1 The Contractor shall attend a meeting with the Consultant, other consultants, Subcontractors, field inspectors, supervisors and the Owner to discuss and resolve administrative procedures and responsibilities, and scheduling prior to commencing the Work.

.2 Items to be discussed at such meeting shall include, but shall not necessarily be limited to the following:

.1 Confirmation of authorized representatives of the Owner, Consultant, other consultants and the Contractor and the name of the Contractor's Construction Safety Officer.
.2 Site orientation.
.3 Brookfield Safety Requirements
.4 Schedules of submissions of shop drawings, data samples and mock-ups
.5 Schedule of Work.
.6 Site security.
.7 Construction safety program.
.8 Hazards and Mitigation measures.
.9 Contemplated change notices, change orders, procedures, approvals required, and administrative requirements.
.10 Takeover procedures, and acceptance.
.11 Monthly progress claims, administrative procedures and holdbacks.
.12 Record drawings, maintenance manuals.
.13 Appointment of inspection agencies or firms

24.0 PROGRESS MEETINGS

.1 The Contractor shall hold bi-weekly meetings on the Site throughout the duration of the Work to discuss progress, safety issues, required information, schedule and other project issues.

.2 The Consultant, other consultants, Contractor, and major Subcontractors where appropriate involved in the Work, are to be in attendance.

.3 The Contractor will record minutes of meetings and circulate same to everyone in the distribution list within three (3) days of meeting.

.4 Agenda may include the following:

.1 Review, approval of minutes of previous meeting.
.2 Review of Work progress since previous meeting.
.3 Field observations, problems, conflicts.
.4 Problems which impede construction schedule.
.5 Review of off-site fabrication delivery schedules
.6 Corrective measures and procedures to regain projected schedule.
.7 Revision to construction schedule.

.8 Progress schedule, during succeeding work period.
.9 Review submittal schedules: expedite as required.
.10 Maintenance of quality standards.
.11 Review proposed changes for affect on construction schedule and on completion date.
.12 Other business.

25.0 PROJECT TURNOVER DATE

.1 The date of Substantial Performance declared for the project will not be acknowledged as the official project turnover date at which time the Owner takes occupancy of the project.

26.0 SYSTEMS DEMONSTRATION

.1 Prior to the application for substantial performance final inspection, the Contractor shall demonstrate operation of each system to the Owner and shall instruct personnel in operation, adjustment, and maintenance of equipment and systems, using data provided by operation and maintenance manuals as the basis for instruction.

27.0 RECORDS

.1 For at least one year after issuance of certificate of Substantial Performance, the Contractor shall keep all records, accounts, statements and other documents relating to the performance of the Work, and shall permit representatives of the Owner to inspect and audit them at all reasonable times.

28.0 PROTECTION

.1 The Contractor shall take all necessary precautions to fully protect the existing buildings' surfaces against damage during selective demolition, renovations and/or installation of new work.

.2 The Contractor shall make good, at no expense to the Owner, any damage or disruption caused to the existing buildings and to utilities and services not called for as part of the Work of this contract. All repair work shall only be done after consultation with the Consultant, Owner, and/or appropriate parties and authorities and to standards and codes of the authorities having jurisdiction.

.3 Damage of any nature done to existing buildings except where required to accommodate new construction and renovations, shall be made good to the satisfaction of the Consultant and Owner and at no additional cost.

.4 Making good shall mean restoration to at least the original condition in terms of strengths, safety, workmanship and appearance.

.5 The Contractor shall provide air tight dust screens with plywood boarding painted one side and take all necessary precautions to fully protect existing finishes, including carpeting, resilient flooring, furniture and other existing items when carrying out renovation work within the existing premises.

29.0 RENOVATION WORK

.1 The Contractor shall plan renovations to a cut-off point giving the limits of any refinishing work which will allow a normal blending in or new to existing.

.2 Cutting and patching existing work shall be carried out in a similar manner throughout the project, with refinishing blended into existing.

.3 The Contractor shall make good existing work as necessary due to the connection and installation of new work to existing. Contractor shall make good surfaces, patch up holes in existing walls, and floors and restore existing exterior surfaces to match existing.

.4 In the sections of the specifications which follow this section, no concerted attempt has been made to describe each of the various existing products that must be used to patch, match, extend or replace existing work. Obtain all such products in time to complete the work on schedule. Such products shall be provided in quality which is in no way inferior to the existing products.

.5 Where new work abuts or finishes flush with existing work, make the transition as smooth and workmanlike as possible. Patched work shall match existing adjacent work in texture and appearance so as to make the patch or transition invisible to the eye at a distance of 900 mm.

30.0 EXISTING UTILITIES AND SERVICES

.1 The Contractor shall verify location of and limitations imposed by existing mechanical, electrical, telephone and similar services, and protect them from damage. If necessary, he shall relocate active services to ensure that they function continuously in safety and with risk of damage.

31.0 ADDITIONAL REQUIREMENTS

.1 Contractors shall refrain from using vulgar or obscene language on site.

.2 Appropriate dress is required for all Contractors and Subcontractors.

.3 No flammable materials storage (with the exception of paint and coatings forming part of the Work) is permitted on the premises or in any buildings.

32.0 OWNER'S EQUIPMENT

.1 Prepare the Works to receive Owner's equipment, fixtures and devices. Preparation shall include review of Owner's equipment information and review of equipment when delivered and all necessary roughing-in, conduit, piping, depressions, trimming, openings, inserts, etc as indicated on Owner's equipment information or on equipment when delivered. Items shall be supplied and installed under this Contract as noted.

.2 Incorporate scheduling of Owner supplied equipment into the construction schedule to be prepared by the Contractor.

33.0 FINAL CLEANING

.1 The Contractor shall:

.1 Remove waste products and debris other than that caused by the Owner, other contractors or their employees, and leave the Work immaculately clean and suitable for occupancy.

.2 Remove surplus products, tools, construction machinery and equipment. Remove waste products and debris other than that caused by the Owner or other Contractors.

.3 Make arrangements with and obtain permits from authorities having jurisdiction for disposal of waste and debris during construction and at Substantial Performance.

.4 Clean and polish glass, mirrors, hardware, floor tile, wall tile, stainless steel, chrome, baked enamel, plastic laminate, mechanical and electrical fixtures.

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

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

.7 Clean, vacuum or seal, or prepare floor finishes, as recommended by the manufacturer and as specified.

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

.9 Clean equipment and fixtures to a sanitary condition, clean or replace filters of mechanical equipment

.10 Clean off all marks and dirt from aluminum and clean and polish all glass.

.11 Clean and polish finish hardware.

.12 Vacuum and damp sponge clean all architectural millwork inside and out.

.13 Remove all marks, stains and fingerprints from painted, decorated and stained Work.

.14 Clean ductwork and replace filters used during construction.

34.0 PROJECT COMMISSIONING

.1 The Contractor shall:

.1 expedite and complete deficiencies and defects identified by the Consultant.

.2 review maintenance manual contents (operation, maintenance instructions, as-built drawings, spare parts, materials) for completeness.

.3 submit required documentation such as statutory declarations, Workers' Compensation certificates, warranties, certificates of approval or acceptance from regulating bodies.

.4 attend “end-of-work” testing and break-in or start-up demonstrations.

.5 review inspection and testing reports to verify that the findings conform to the intent of the documents and that changes, repairs or replacements have been completed.

.6 review condition of equipment that has been used in the course of the Work to ensure turning over at completion in “as new condition” with warranties, dated and certified from time of Substantial Performance of the Work.

.7 arrange and coordinate instruction of Owner's staff in care, maintenance and operation of building systems and finishes by suppliers or Subcontractors.

.8 when partial occupancy of uncompleted Project is required by the Owner, coordinate Owner's uses, requirements and access with Contractor's requirements to complete Project.

.9 provide ongoing review, inspection and attendance to building call back, and maintenance, and repair problems during the warranty periods.

35.0 SERVICES PENETRATION

.1 Base building is constructed of post tension floor slabs. All floor penetrations must be located to avoid conflict with post tension cable, conduit, etc, within floor slab. X-rays are required at all proposed floor penetration to reduce the possibility of conflict or damage.

36.0 COST BREAKDOWN

.1 Before submitting first progress claim submit breakdown of the Contract price in detail as directed by the Consultant and aggregating the Contract Price. After approval by the Consultant and Owner cost breakdown will be used as basis for progress payment.

37.0 LIST OF PRE-APPROVED SUB-CONTRACTORS

.1 Refer to Appendix 2 of this specification for landlord's list of sub-contractors.

END OF SECTION 01 10 00

1.0 GENERAL

1.1 INTENT

.1 This section provides requirements related to the Bid and Contract Documents for this Project, all in keeping with the Freedom of Information and Protection of Privacy Act. Bidders may wish to seek their own legal advice on specific aspects of these obligations.

.2 All responses to this Tender will be subject to the British Columbia Freedom of Information and Protection of Privacy Act (FOIPPA).

.3 Bidders may obtain more information from the Office of the Information & Privacy Commissioner for British Columbia website www.oipc.bc.ca.

1.2 BID DOCUMENTS

.1 All Records submitted by a bidder to the Owner, are in the Custody of the Owner and, as such, may be subject to the access and privacy provisions of the FOIPP ACT. This act will apply to the Owner, and will give any person a right of access to the Records in the Custody or Control of the Owner, subject to limited and specific exceptions.

.2 A bidder shall identify all information provided in bid submission documents that he considers confidential and shall disclose the basis for such confidentiality, including those parts of the bid submission that relate to:

- .1 Trade secrets,
- .2 Commercial, financial, labour relations, scientific or technical information,
- .3 Personal information regarding persons who would provide services related to this invitation to bid, including their names, qualifications, experience, and employment history.
  - .1 The purpose of collecting personal information is to enable the Owner to evaluate the bidder's submission in response to the invitation to bid.

.3 It is recommended that bidders advise persons whose personal information is being provided to the Owner as a response to this invitation to bid that their personal information may be subject to disclosure to members of the public under the FOIPP ACT.

.4 The Owner will endeavor to use the FOIPP ACT to protect information identified by bidders as confidential, however under these and other sections of the Act, the information may have to be disclosed to members of the public who request access to Records in the Owner's Custody.

.5 The Owner will not disclose, to the extent permitted by law, the evaluation of any or all bids. However, a bidder may request general information in regard to the evaluation of their own bid.

END OF SECTION 01 14 00

1.0 GENERAL

1.1 REFERENCES

.1 All references to Codes, Standards and standard Specifications referred to in these Specifications or used on drawings shall mean and intend to be the currently adopted edition, amendment and revision of such reference standards in effect at the time of Bid closing.

.2 Referenced Standards and Code requirements shall be considered minimum requirements.

.3 Applicable portions of Standards used that are not in conflict with the Contract Documents are hereby made a part of the Specifications.

.4 Modifications or exceptions to Standards shall be considered as amendments, and unmodified portions shall remain in full effect.

.5 In cases of discrepancies between the Specifications and Standards, the requirements of the Specification shall govern.

.6 In cases of discrepancies between Codes and the Specifications, the Code requirements shall govern.

.7 Where references to Codes or Standards are used in these Specifications, the Contractor must familiarize himself with the applicable portions and shall be governed by them.

.8 If requested, the Contractor shall furnish an affidavit from manufacturers certifying that materials or products delivered to the project meet the requirements specified. However, such certifications shall not relieve the Contractor from the responsibility of complying with any added requirements specified in the Contract Documents.

1.2 DESIGNATION EXPLANATION

.1 National Standard of Canada designation (CAN)
The number following the CAN designation represents the agency under whose auspices the standard is issued.
CAN1 designates CGA
CAN2 designates CGSB
CAN3 designates CSA and
CAN4 designates ULC

1.3 ABBREVIATIONS

.1 References to a Technical Society, Association, or Code is made in these Specifications in accordance with the following abbreviations:

Acoustical Materials Association	AMA
Air Movement & Control Association	AMCA
American Concrete Institute	ACI
American Iron & Steel Institute	AISI
American National Standards Institute	ANSI
American Society for Testing & Materials	ASTM
American Society of Heating, Refrigerating & Airconditioning Engineers	ASHRAE
American Society of Mechanical Engineers	ASME
American Standards Association	ASA
American Welding Society	AMS
American Wood Preservers' Association	AWPA

Architectural Woodwork Manufacturers Association of Canada	AWMAC
Association of Wall & Ceiling Contractors of B.C.	AWCC
British Columbia Building Code	BCBC
Canadian Gas Association	CGA
Canadian General Standards Board	CGSB
Canadian Institute of Steel Construction	CISC
Canadian Institute of Timber Construction	CITC
Canadian Roofing Contractors Association	CRCA
Canadian Sheet Steel Building Institute	CSSBI
Canadian Standards Association	CSA
Canadian Steel Door and Frame Manufacturing Association	CSDFMA
Canadian Welding Bureau	CWB
Canadian Wood Council	CWC
Construction Materials Board	CMB
Construction Specifications Canada	CSC
Corregated Steel Pipe Institute	CSPI
Electrical and Electronic Manufacturers Association of Canada	EEMAC
Factory Mutual	FM
Fire Commission of Canada	FCC
Hydronics Institute	HI
Heating, Refrigeratinga and Air-Conditioning Institute of Canada	HRAI
Insulated Glass Manufacturers Association of Canada	IGMAC
Industrial Fabric Association International	IFAI
Master Painters Institute	MPI
National Association of Architectural Metal Manufacturers	NAAMM
National Building Code	NBC
National Electrical Manufacturers Association	NEMA
National Fire Protection Association	NFPA
National Hardwood Lumber Association	NHLA
National Lumber Grades Authority	NLGA
National Research Council	NRC
Roofing Contractors Association of BC	RCABC
Standards Council of Canada	SCC
Steel Structural Painting Council	SSPC
Terrazzo, Tile & Marble Association of Canada	TTMAC
Underwriters Laboratories Inc	UL
Underwriters Laboratories of Canada	ULC
Warnock Hersey	WH
Workmans Compensation Board	WCB

END OF SECTION 01 14 22

1.0 GENERAL

1.1 SUMMARY

.1 This section includes administrative and procedural requirements for quality assurance and quality control.

.2 Testing and inspecting services are required to verify compliance with requirements specified or indicated. These services do not relieve Contractor of responsibility for compliance with the Contract Document requirements:

.1 Specific quality control requirements for individual construction activities are specified in the sections that specify those activities. Requirements in those sections may also cover production of standard products.

.2 Specified tests, inspections, and related actions do not limit Contractor's quality control procedures that facilitate compliance with the Contract Document requirements.

.3 Requirements for Contractor to provide quality control services required by Consultant, Owner, or authorities having jurisdiction are not limited by provisions of this section.

.3 This section specifies general requirements and procedures for Contractor construction of Mock-Ups required for Quality Assurance and confirmation of assembly techniques. Additional specific requirements for submissions are specified in individual.

1.2 RELATED SECTIONS

.1 Section 01 32 00 – Project Schedule: Develop a schedule of required tests and inspections, and construction of required mock-ups.

.2 Section 01 73 29 – Cutting and Patching: Repair and restoration of construction disturbed by testing and inspecting activities.

.3 Divisions 2 through 49 sections and drawings for specific test and inspection requirements.

1.3 REFERENCE STANDARDS

.1 Within the text of the Project Manual, reference may be made to the standards referenced in Section 00 14 22- Reference Standards-BC. The testing of materials may be requested by the Owner, to prove conformance with these standards.

.2 The referenced standard and any amendments or updates that may be in force on the day of receipt of Bids shall be applicable to the work during the duration of the Contract.

1.4 DEFINITIONS

.1 Quality Assurance Services: Activities, actions, and procedures performed before and during execution of the Work by the Contractor to guard against defects and deficiencies and ensure that proposed construction complies with requirements.

2 Quality Control Services: Tests, inspections, procedures, and related actions during and after execution of the Work by a third party testing agency to evaluate that completed construction complies with requirements. Services do not include contract enforcement activities performed by Consultant.

.3 Mock-Ups: Full size, physical example assemblies to illustrate finishes and materials. Mock-ups are used to verify selections made under sample submittals, to demonstrate aesthetic effects and, where indicated, qualities of materials and execution, and to review construction, coordination, testing, or operation; they are not samples. Mock-ups establish the standard by which the Work will be judged.

.4 Testing Agency: An entity engaged to perform specific tests, inspections, or both. Testing laboratory shall mean the same as testing agency.

1.5 DELEGATED DESIGN

.1 Provide letters of commitment and compliance where design services or certifications by a design a Professional Engineer are specifically required of Contractor by the Contract Documents.

1.6 SUBMITTALS

.1 Qualification Data: For testing agencies specified in 1.7 below to demonstrate their capabilities and experience. Include proof of qualifications in the form of a recent report on the inspection of the testing agency by a recognized authority.

.2 Delegated Design Submittal: In addition to Shop Drawings, Product Data, and other required submittals, submit a statement, signed and sealed by the responsible design professional, for each product and system specifically assigned to Contractor to be designed or certified by a design professional, indicating that the products and systems are in compliance with performance and design criteria indicated:

.1 Include list of codes, loads, and other factors used in performing these services.
.2 Include Letter of Commitment and Letter of Compliance when directed by technical specification section.

.3 Schedule of Tests and Inspections: Prepare in tabular form and include the following:

.1 Specification section number and title.
.2 Description of test and inspection.
.3 Identification of applicable standards.
.4 Identification of test and inspection methods.
.5 Number of tests and inspections required.
.6 Time schedule or time span for tests and inspections.
.7 Entity responsible for performing tests and inspections.
.8 Requirements for obtaining samples.
.9 Unique characteristics of each quality control service.

.4 Reports: Prepare and submit certified written reports that include the following:

.1 Date of issue.
.2 Project title and number.
.3 Name, address, and telephone number of testing agency.
.4 Dates and locations of samples and tests or inspections.
.5 Names of individuals making tests and inspections.
.6 Description of the Work and test and inspection method.
.7 Identification of product and Specification section.
.8 Complete test or inspection data.
.9 Test and inspection results and an interpretation of test results.
.10 Ambient conditions at time of sample taking and testing and inspecting.
.11 Comments or professional opinion on whether tested or inspected Work complies with the Contract Document requirements.
.12 Name and signature of laboratory inspector.
.13 Recommendations on re-testing and re-inspecting.

.5 Permits, Licenses, and Certificates: For Owner's records, submit copies of permits, licenses, certifications, inspection reports, releases, jurisdictional settlements, notices, receipts for fee payments, judgments, correspondence, records, and similar documents, established for compliance with standards and regulations bearing on performance of the Work.

1.7 QUALITY ASSURANCE

.1 Fabricator Qualifications: A firm experienced in producing products similar to those indicated for this Project and with a record of successful in service performance, as well as sufficient production capacity to produce required units.

.2 Factory Authorized Service Representative Qualifications: An authorized representative of manufacturer who is trained and approved by manufacturer to inspect installation of manufacturer's products that are similar in material, design, and extent to those indicated for this Project.

.3 Installer Qualifications: A firm or individual experienced in installing, erecting, or assembling work similar in material, design, and extent to that indicated for this Project, whose work has resulted in construction with a record of successful in service performance.

.4 Manufacturer Qualifications: A firm experienced in manufacturing products or systems similar to those indicated for this Project and with a record of successful in service performance.

.5 Professional Engineer Qualifications: A professional engineer who is legally qualified to practice in jurisdiction where Project is located and who is experienced in providing engineering services of the kind indicated. Engineering services are defined as those performed for installations of the system, assembly, or product that are similar to those indicated for this Project in material, design, and extent.

.6 Testing Agency Qualifications: An agency with the experience and capability to conduct testing and inspecting indicated, and that specializes in types of tests and inspections to be performed.

1.8 MOCK-UPS

.1 Before installing portions of the Work requiring mock-ups, build mock-ups for each form of construction and finish required to comply with the requirements of this section, and any additional requirements listed in the technical sections, using materials indicated for the completed Work.

.2 Build mock-ups in location and of size indicated or, if not indicated, as directed by Consultant.

.3 Notify Consultant seven (7) days in advance of dates and times when Mock-ups will be constructed:

.1 Failure to prepare mock-up in ample time is not considered sufficient reason for an extension of Contract Time and no claim for extension by reason of such default will be allowed.

.2 If requested, the Consultant will assist in preparing a schedule fixing the dates for preparation or mock-ups.

.4 Demonstrate the proposed range of aesthetic effects and workmanship.

.5 Obtain Consultant's acceptance of mock-ups prior to starting work, fabrication, or construction; unacceptable mock-ups shall be modified or replaced as directed by the Consultant as required to obtain acceptance.

.6 Maintain Mock-ups during construction in an undisturbed condition as a standard for judging the completed Work.

.7 Demolish and remove mock-ups from Project site when directed by the Consultant; acceptable mock-ups in an undisturbed condition at the time of Substantial Performance may become part of the completed Work where they form a part of the completed Work.

1.9 QUALITY CONTROL

.1 Owner Responsibilities: Where quality control services are indicated as Owner's responsibility, Owner will engage a qualified testing agency to perform these services:

.1 Owner will furnish Contractor with names, addresses, and telephone numbers of testing agencies engaged and a description of the types of testing and inspecting they are engaged to perform.

.2 Costs for re-testing and re-inspecting construction that replaces or is necessitated by work that failed to comply with the Contract Documents will be charged to Contractor.

.3 The following types of testing and inspection will be paid for by the Owner:

.1 Additional tests and inspections may be required by the Owner where tests are determined to be necessary.

.2 All other testing and inspection required by Specifications or by authorities having jurisdiction shall be paid for by the Contractor. Include costs in Bid.

.2 Contractor's Responsibilities: Unless otherwise indicated, provide quality control services specified and required by authorities having jurisdiction:

.1 Where services are indicated as Contractor's responsibility, engage a qualified testing agency to perform these quality control services. Contractor shall not employ the same entity engaged by Owner, unless agreed to in writing by Owner.

.2 Contractor to include in the work the following testing inspections and as indicated in the Specifications.

.1 AWMAC – Reference Section 06 40 00

.2 MPDA – Reference Section 09 91 00

.3 Where services are indicated as the Owner's responsibility, the Contractor shall contact Consultant and arrange with the Owner's testing and inspection personnel to perform their Work at proper times.

.4 Notify testing agencies at least three (3) working days in advance of time when Work that requires testing or inspecting will be performed.

.5 Where quality control services are indicated as Contractor's responsibility, submit a certified written report, in duplicate, of each quality control service.

.6 Testing and inspecting requested by Contractor and not required by the Contract Documents are Contractor's responsibility.

.7 Submit additional copies of each written report directly to authorities having jurisdiction, when they so direct.

.8 Submit four (4) copies of inspection and test reports to the Consultant.

.3 Contractor's Project Control: Ensure that only specified or approved materials are used. Provide and maintain an effective quality control program and perform sufficient inspections and tests of all items of Work, including those of Subcontractor, to ensure compliance with Contract Documents:

.1 Ensure that installation is in accordance with the Specifications and to manufacturer's directions, or to methods that have been submitted and approved in writing by the Consultant prior to proceeding with the Work.

.2 The project Superintendent shall communicate these requirements to the trade foremen immediately before the Work of their trade commences at the site.

.4 Subcontractor's Responsibility: The Contractor will coordinate and assign testing requirements to individual Subcontractors. Tests required by Subcontractors shall be paid for by Subcontractors, unless tests are specifically noted as being paid for by the Owner or Contractor.

.5 Manufacturer's Field Services: Where indicated, engage a factory authorized service representative to inspect field assembled components and equipment installation, including service connections. Report results in writing.

.6 Testing Agency Responsibilities: Cooperate with Consultant and Contractor in performance of duties. Provide qualified personnel to perform required tests and inspections:

.1 Notify Consultant and Contractor promptly of irregularities or deficiencies observed in the Work during performance of its services.
.2 Interpret tests and inspections and state in each report whether tested and inspected work complies with or deviates from requirements.
.3 Submit a certified written report, in duplicate, of each test, inspection, and similar quality control service through Contractor when tests are paid for by Contractor, or to the Owner when paid for by the Owner.
.4 Do not release, revoke, alter, or increase requirements of the Contract Documents or approve or accept any portion of the Work.
.5 Do not perform any duties of Contractor.

.7 Associated Services: Cooperate with agencies performing required tests, inspections, and similar quality control services, and provide reasonable auxiliary services as requested. Notify agency sufficiently in advance of operations to permit assignment of personnel. Provide the following:
.1 Access to the Work.
.2 Incidental labour and facilities necessary to facilitate tests and inspections.
.3 Adequate quantities of representative samples of materials that require testing and inspecting. Assist agency in obtaining samples.
.4 Facilities for storage and field curing of test samples.
.5 Preliminary design mix proposed for use for material mixes that require control by testing agency.
.6 Security and protection for samples and for testing and inspecting equipment at Project site.

.8 Coordination: Coordinate sequence of activities to accommodate required quality assurance and quality control services with a minimum of delay and to avoid necessity of removing and replacing construction to accommodate testing and inspecting:
.1 Schedule times for tests, inspections, obtaining samples, and similar activities.
.2 Distribution: Distribute schedule to Owner, Consultant, testing agencies, and each party involved in performance of portions of the Work where tests and inspections are required.

1.10 RE-TESTING/RE-INSPECTIONS

.1 Re-testing/Re-inspecting: Regardless of whether original tests or inspections were Contractor's responsibility, provide quality control services, including re-testing and re-inspecting, for construction that revised or replaced Work that failed to comply with requirements established by the Contract Documents.

.2 Costs for re-testing and re-inspections shall be paid for by Contractor or as otherwise assigned to responsible Subcontractor by the Contractor.

1.11 REJECTED WORK

.1 Remove defective Work, whether the result of poor workmanship, use of defective products or damage and whether incorporated in the Work or not, which has been rejected by the Consultant as failing to conform to the Contract Documents. Replace or re-execute in accordance with the Contracts Documents.
.2 Make good other Contractor's work damaged by such removals or replacements promptly.
.3 Where corrective work is not expedient to repair rejected Work, or Work is not performed in accordance with the Contract Documents, the Owner may deduct from the Contract Price the difference in value between the Work performed and that called for by the Contract Documents, the amount of which shall be determined by the Consultant.

1.12 COORDINATION OF TESTING BY CONTRACTOR

.1 Contractor will coordinate all testing required by Owner and individual requirements of the specifications.

.2 Subcontractor shall furnish to Contractor, upon request, test results from testing performed by Subcontractor and as required by technical specifications.

2.0 PRODUCTS

2.1 MOCK-UPS

.1 Erect mock-ups on-site, at locations acceptable to Consultant.

.2 Reviewed and accepted mock-ups will become standards of workmanship and material against which installed work will be assessed.

.3 Required mock-ups are listed in the Technical Specification Sections (Divisions 02 through 40). Some mock-ups require several sections of work to cooperate and construct a complete assembly. Coordinate the activities of these sections to ensure that required mock-ups are completed.

.4 In addition to the Mock-Ups specified in the Technical Specification Sections, the Consultant will require the following:

.1 Provide list of mock-ups required from technical sections.

.5 Mock-ups that are found acceptable by the Consultant may form a part of the permanent work of the Project. Where modifications are required, they shall be completed and form the standard of acceptance for the remainder of the Project. Where mock-ups are found not acceptable, mock-up shall be repaired or replaced as directed. Specification sections identify whether the mock-up may remain as part of the Work or must be removed.

3.0 EXECUTION

3.1 REPAIR AND PROTECTION

.1 General: On completion of testing, inspecting, sample taking, and similar services, repair damaged construction and restore substrates and finishes:

.1 Comply with the Contract Document requirements for Section 01 73 29 – Cutting and Patching.

.2 Protect construction exposed by, or for quality control service activities.

.3 Repair and protection are Contractor's responsibility, regardless of the assignment of responsibility for quality control services.

END OF SECTION01 14 50

1.0 GENERAL

1.1 SUMMARY

.1 This Section includes requirements for temporary facilities and controls, including temporary utilities, support facilities, and security and protection facilities.

.2 Temporary utilities may include, but are not limited to, the following:

.1 Sanitary facilities, including toilets, wash facilities, and drinking water facilities

.2 Telephone and Internet service

.3 Support facilities include, but are not limited to, the following:

.1 Temporary signs
.2 Field offices
.3 Storage and fabrication areas
.4 Lifts and hoists
.5 Temporary elevator usage
.6 Construction aids and miscellaneous services and facilities

.4 Security and protection facilities include, but are not limited to, the following:

.1 Security enclosure and lockup.
.2 Barricades, warning signs, and lights.
.3 Fire protection.

1.2 RELATED SECTIONS

.1 Section 01 10 00 – Schedules: Indicate installation of critical temporary facilities, and installation and removal of temporary utilities.

.2 Divisions 2 through 49 for temporary heat, ventilation, and humidity requirements for installation environment for products in technical sections.

1.3 AVAILABILITY OF UTILITIES

.1 It is the intention of the Owner to supply temporary services such as water, electricity, washrooms, etc., however, in the event of any unforeseen occurrence, the Owner may discontinue such temporary service, without notice, and without acceptance of any liability, for damage or delay, caused by such withdrawal of temporary services.

.2 Supply of temporary services by the Owner is subject to the requirements of the Owner and the level of availability of existing services.

.3 Contractor shall bear costs of all temporary services required for the project in excess of those, available from existing services, supplied by the Owner.

1.4 SUBMITTALS

.1 Temporary Utility Reports: Submit reports of tests, inspections, meter readings, and similar procedures performed on temporary utilities.

1.5 QUALITY ASSURANCE

.1 Arrange for authorities having jurisdiction to test and inspect each temporary utility before use.

.2 Obtain required certifications and permits.

1.6 PROJECT CONDITIONS

.1 Installer of each permanent service shall assume responsibility for operation, maintenance, and protection of each permanent service during its use as a construction facility before Owner's acceptance, regardless of previously assigned responsibilities.

.2 Keep temporary services and facilities clean and neat.

.3 Relocate temporary services and facilities as required by progress of the Work.

2.0 PRODUCTS

2.1 MATERIALS

.1 Provide new materials; undamaged, previously used materials in serviceable condition may be used if approved by Consultant. Provide materials suitable for use intended.

.2 Lumber and Plywood: In accordance with requirements in Section 06 10 00 – Rough Carpentry.

.3 Gypsum Board: Minimum 16 mm (5/8”) thickness x 1220 mm (48”) wide by maximum available lengths; regular type panels with tapered edges, as specified in Section 09 29 00 – Gypsum Board Systems.

.4 Insulation: Unfaced mineral fibre blanket, manufactured from glass, slag wool, or rock wool; with maximum flame spread and smoke developed classification of 25/50, as specified in Section 07 21 00 – Thermal Insulation.

.5 Paint: In accordance with requirements in Section 09 91 00 Painting.

.6 Tarpaulins: Fire resistive labelled with flame spread rating of 15 or less.

.7 Water: Potable.

2.2 FIRE PROTECTION

.1 Provide hand carried, portable, ULC rated fire extinguishers in class and extinguishing agent as indicated or a combination of extinguishers of NFPA recommended classes for exposures encountered on the work site.

.2 Fire extinguishers will in accordance with NFPA 10 and NFPA 241 for classification, extinguishing agent, and size required by location and class of fire exposure.

.3 During full time of construction, while existing buildings remain occupied, maintain free unobstructed access to all sides of existing buildings for fire department vehicles. Confirm access with fire department.

2.3 EQUIPMENT

.1 Provide equipment suitable for use intended.

.2 Provide containerized, tap dispenser, bottled water drinking water units, including paper cup supply.

.3 Provide properly configured, NEMA polarized outlets to prevent insertion of 110 V plugs into higher voltage outlets; equipped with ground fault circuit interrupters, reset button, and pilot light.

.4 Provide power distribution system circuits, and overhead and exposed for surveillance, wiring circuits, not exceeding 125 VAC, 20 A rating, and lighting circuits may be non-metallic sheathed cable in accordance with the requirements of the authorities having jurisdiction.

2.4 HOARDING

.1 Provide sound proof and dust tight hoarding or partitions to localize noise and dust-generating activities between the 2 floors at the interconnected stair location, and for the protection of workers, finished areas of the Work and the public.

.2 Maintain and relocate protection until work for whole floor is completed.

.3 Hoarding to be 16mm thick gypsum wall board, taped and mud on 2 x4 wood frame or equivalent steel stud framing filled with acoustic batt insulation wall to be constructed to the under side of structural slab.

2.5 PROTECTION OF BUILDING FINISHES AND EQUIPMENT

.1 Provide protection for finished and partially finished building finishes and equipment during performance of the Work.

.2 Be responsible for damage incurred due to lack or improper protection.

2.6 ELEVATORS

.1 Existing base building elevators may be used by construction personnel and for transporting of materials. Coordinate use with Consultant.

.2 Provide protective coverings for finish surfaces of cabs and entrances.

.3 Make good any damage to permanent installation resulting from use.

2.7 SECURITY

.1 The Contractor shall adequately protect their work and adjoining work at all stages of construction until the work has been accepted by the Consultant and Owner.

2.8 FIRST AID

.1 Provide first aid resources and facilities for workers in accordance with WCB requirements and local authorities.

3.0 EXECUTION

3.1 INSTALLATION, GENERAL

.1 Locate facilities where they will serve Project adequately and result in minimum interference with performance of the Work. Relocate and modify facilities as required.

.2 Provide each facility ready for use when needed to avoid delay. Maintain and modify as required. Do not remove until facilities are no longer needed or are replaced by authorized use of completed permanent facilities.

3.2 TEMPORARY TELEPHONE INSTALLATION/ COMPUTER AND INTERNET

.1 Install a dedicated telephone line for each facsimile: machine and photocopier/ scanner and computer with in the field office.

.2 Install a telephone.

.3 Post a list of important telephone numbers at each telephone location including, but not limited to, the following:

.1 Police and fire departments
.2 Ambulance service
.3 Contractor's home office
.4 Consultant's office

.5 Subconsultant' offices
.6 Owner's office
.7 Principal subcontractors' field and home offices

.4 Provide an answering machine, voice mail service, or messaging service on superintendent's telephone.

.5 Furnish superintendent with cell phone for use when away from field office.

.6 Furnish superintendent with a computer and internet access.

3.3 WASTE DISPOSAL FACILITIES

.1 Provide waste collection containers in sizes adequate to handle waste from construction operations.

.2 Containerize and clearly label hazardous, dangerous, or unsanitary waste materials separately from other waste.

.3 Provide separate containers, clearly labelled, for each type of waste material to be deposited, if required by authorities having jurisdiction, and as per requirements of Section 01 74 19 Waste Management.

3.4 SECURITY AND PROTECTION FACILITIES INSTALLATION

.1 Secure project site against illegal entry at end of each workday.

.2 Provide protection, operate temporary facilities, and conduct construction in ways and by methods that in accordance with environmental regulations and that minimize possible air, waterway, and subsoil contamination or pollution or other undesirable effects.

.3 Avoid using tools and equipment that produce harmful noise:
.1 Restrict use of noisemaking tools and equipment to hours that will minimize complaints from neighbouring persons or businesses near Project site.
.2 Restrict use of noisemaking tools and equipment to in accordance with local bylaws and the authorities having jurisdiction.
.3 Refer to Tenant Work Rules in Appendix 3 of specification.

3.5 TEMPORARY FIRE PROTECTION

.1 Install and maintain temporary fire protection facilities of types needed to protect against reasonably predictable and controllable fire losses until permanent facilities are complete and operational.
.1 In accordance with requirements of authorities having jurisdiction and NFPA 241, Standard for Safeguarding Construction, Alteration, and Demolition Operations.
.2 Provide fire extinguishers, installed on walls on mounting brackets, visible and accessible from space being served, with sign mounted above.
.1 Class ABC dry chemical extinguishers or a combination of extinguishers of NFPA recommended classes for exposures.
.2 Locate fire extinguishers where convenient and effective for their intended purpose; provide not less than one extinguisher on each floor at or near each usable stairwell.

.2 Store combustible materials in containers in fire safe locations.

.3 Maintain unobstructed access to fire extinguishers, fire hydrants, temporary fire protection facilities, stairways, and other access routes for firefighting. Prohibit smoking in hazardous fire exposure areas.

.4 Supervise welding operations, combustion type temporary heating units, and similar sources of fire ignition.

.5 Develop and supervise an overall fire prevention and first aid fire protection program for personnel at Project site. Review needs with local fire department and establish procedures to be followed. Instruct personnel in methods and procedures. Post warnings and information.

3.6 OPERATION, TERMINATION, AND REMOVAL

.1 Enforce strict discipline in use of temporary facilities to minimize waste and abuse, limit availability of temporary facilities to essential and intended uses.

.2 Maintain facilities in good operating condition until removal. Protect from damage caused by freezing temperatures and similar elements:

.3 Except for using permanent fire protection as soon as available, do not change over from using temporary security and protection facilities to permanent facilities until Declaration of Substantial Performance.

3.7 TERMINATION AND REMOVAL

.1 Remove each temporary facility when need for its service has ended, when it has been replaced by authorized use of a permanent facility, or no later than Substantial Performance.

.2 Complete or, if necessary, restore permanent construction that may have been delayed because of interference with temporary facility. Repair damaged Work, clean exposed surfaces, and replace construction that cannot be satisfactorily repaired.

.3 Materials and facilities that constitute temporary facilities are the property of Contractor.

.4 Clean and renovate permanent facilities used during construction period. In accordance with final cleaning requirements in Section 01 74 11 – Cleaning.

END OF SECTION 01 15 00

1.0 GENERAL

1.1 SUMMARY

.1 This Section includes administrative provisions for coordinating construction operations on Project including, but not limited to, the following:
- .1 General project coordination procedures.
- .2 Conservation.
- .3 Coordination of Drawings.
- .4 Administrative and supervisory personnel.

.2 Each Subcontractor shall participate in coordination requirements. Certain areas of responsibility will be assigned to specific Subcontractors by the Contractor.

1.2 RELATED SECTIONS

.1 Section 01 10 00 – Summary

.2 Section 01 77 00 – Contract Closeout Procedures

1.3 COORDINATION

.1 Contractor shall coordinate construction operations included in various Sections of the Specifications to ensure efficient and orderly installation of each part of the Work.

.2 Contractor shall coordinate construction operations, included in different Sections, that depend on each other for proper installation, connection, and operation with the Subcontractors as follows:
- .1 Scheduling construction operations in sequence required to obtain the best results where installation of one part of the Work depends on installation of other components, before or after its own installation.
- .2 Coordinating installation of different components with Subcontractors to ensure maximum accessibility for required maintenance, service, and repair.
- .3 Making adequate provisions to accommodate items scheduled for later installation.

.3 Contractor will prepare memoranda if necessary, for distribution to each party involved, outlining special procedures required for coordination. Include such items as required notices, reports, and list of attendees at meetings:
- .1 Prepare similar memoranda for Owner if coordination of Owner installed Work is required.

.4 Subcontractor will coordinate scheduling and timing of required administrative procedures with other construction activities, and activities of other contractors if any, to avoid conflicts and to ensure orderly progress of the Work. Administrative activities include, but are not limited to, the following:
- .1 Preparation of Contractor's Construction Schedule.
- .2 Preparation of the Schedule of Values.
- .3 Installation and removal of temporary facilities and controls.
- .4 Delivery and processing of submittals.
- .5 Progress meetings.
- .6 Preinstallation conferences.
- .7 Project closeout activities.

1.4 SUBMITTALS

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

.2 Coordination Drawings: Prepare Coordination Drawings if limited space availability necessitates maximum utilization of space for efficient installation of different components or if coordination is required for installation of products and materials fabricated by separate entities.
- .1 Indicate relationship of components shown on separate Shop Drawings.

.2 Indicate required installation sequences.

.3 Staff Names: Within 5 days of starting construction operations, submit a list of principal staff assignments, including superintendent and other personnel in attendance at Project site:
- .1 Identify individuals and their duties and responsibilities;
- .2 List addresses and telephone numbers, including home and office telephone numbers;
- .3 Provide names, addresses, and telephone numbers of individuals assigned as standbys in the absence of individuals assigned to Project.

.4 Post copies of list in Project meeting room, in temporary field office, and by each temporary telephone.

2.0 PRODUCTS

2.1 NOT USED

3.0 EXECUTION

3.1 NOT USED

END OF SECTION 01 31 00

PROJECT SCHEDULE

1.1 DEFINITIONS

.1 Master Schedule – The schedule, as prepared by the Consultant and Owner, which outlines the schedule for the complete project.

.2 Construction Schedule – The schedule prepared by the Contractor, which outlines the timing of the construction activities, that when agreed to by the Consultant, will form the schedule for the contractor as called for in the contract. Construction Schedule shall include shop drawing, material and equipment procurement, record drawing and commissioning activities.

.3 2-Week Forward Planning Schedule – The schedule prepared by the Contractor, which details the construction activities to be executed within the forthcoming two (2) weeks. This schedule shall be updated weekly.

.4 Milestones – The timeframes or points in the Master Schedule, which are pertinent to the overall completion of the project.

1.2 COOPERATION AND COORDINATION WITH OTHER TRADES

.1 The Owner may employ other contractor to complete furniture and IT services installation within the project area.

.2 The Contractor shall coordinate his work and cooperate with other contractors working on the project. No additional costs to or delay will be accepted for failure to do so.

END OF SECTION 01 32 00

1.0 DOCUMENTS

.1 This section of the specification forms part of the contract Documents and is to be read, interpreted and coordinated with all other parts of the specification.

.2 Submittals are shop drawings, diagrams, illustrations, schedules, performance charts, brochures, products and other data, which the Contractor provides to illustrate details of a portion of the Work.

2.0 ADMINISTRATIVE

.1 Provide submittals listed in specification sections for review. Submit in orderly sequence so as to not cause delay in the work. Failure to submit samples in time is not considered sufficient reason for an extension of Contract time and no claim for extension by reason of such default will be permitted.

.2 Work affected by the submittal will not proceed until review by the Consultant is complete.

.3 Review submittals prior to submission to the Consultant. This review by the Contractor indicates that necessary requirements have been determined with requirements of the Work and Contract Documents. Submittals not reviewed, dated stamped and signed by the Contractor will be returned without being examined and shall be resubmitted when completed.

.4 Verify that field measurements and affected adjacent work are coordinated.

.5 The Contractor's responsibility for errors and omissions in submissions is not relieved by the Consultant's review of submittals.

.6 The Contractor's responsibility for deviations in submission from requirements of Contract Documents is not relieved by the Consultant's review of submittals unless a deviation on the submittal is noted as such in writing and has been approved by the Consultant.

3.0 SHOP DRAWINGS

.1 Within fourteen (14) calendar days of award of Contract submit a detailed list of all shop drawings, which will be submitted for approval. This list will reflect each individual item, the date of shop drawings submittal and the date that approval will be required in order to comply with the Construction Schedule.

.2 The Contractor is responsible for submitting and instructing Subcontractors and suppliers to submit through its office to the Consultant all shop and setting drawings or diagrams in pdf format.

.3 The Contractor is responsible for submitting and instructing Subcontractors and suppliers to submit product data in pdf format for requirements requested in the specification and as the Consultant may reasonably request where shop drawings will not be prepared due to standardized manufacture of product.

.4 Indicate materials, construction methods and attachment or anchorage, erections diagrams, connections, explanatory notes and other information necessary for completion of the work. Where articles or equipment attach or connect to other articles or equipment, indicate that they have been coordinated regardless of what section adjacent equipment will be supplied and installed. Indicate cross-references to design drawings and specifications.

.5 Make review comments, adjustments or revisions to be brought to the Contractor's or supplier's attention by the Consultant or applicable engineering consultant and returned to the Contractor for printing and distribution. Resubmission of shop tracing may be at the Consultants' discretion. Shop drawings which require extensive correction will be sent back for revisions and resubmission as noted.

.6 The Contractor and each Subcontractor or supplier shall conform to review comments, adjustments and stamped instructions of each shop drawing reviewed.

.7 If, after Consultant review, only minor corrections are to be made, shop drawings will be returned and fabrication and installation of the Work may proceed. Only drawings rejected or noted for revisions and resubmission need be resubmitted through the same review procedure. Include revisions required by previous reviews before resubmission.

.8 No Work which is dependent on shop drawing information will proceed until final review has been completed by the Consultant. The contractor is responsible for Work performed prior to receipt of final reviewed shop drawings. No review comments and adjustments made on shop drawings by the Consultant shall be construed as authorization for changes in the Work or the Contact Price. If adjustment affects the value of the Work, advise the Consultant in writing prior to proceeding with the Work.

.9 Fabricate Work exactly as shown on final reviewed shop drawings and, if shop practice dictates revisions, request approval by revising shop drawings and resubmitting to the Consultant.

.10 File one (1) copy of each final reviewed shop drawing on site for construction, reference and viewing by the Consultant.

.11 The Contractor and each Subcontractor or supplier shall consider the foregoing paragraphs as the minimum requirements. Further instructions contained in a particular specification section govern that section of the Work.

.12 Prepare shop drawings to the same measurement system (i.e.: metric or imperial units) as the Contract Documents.

.13 Contractor to submit all shop drawings in PDF format. Electronic submissions will only be reviewed and returned electronically. No hardcopies will be returned to contractor.

4.0 SAMPLES

.1 Where required by a particular specification section by the Consultant, submit samples in triplicate for approval and required testing. Samples to be the materials specified or of the pre-approved alternatives. No deviation permitted after approval of samples.

.2 The Contractor or applicable Subcontractor or supplier to prepare the following:

- .1 Submit samples in sizes and quantities as required in respective section.
- .2 Label samples as to origin and intended use, project, name, contractor, and date.
- .3 Deliver samples prepaid to the Consultant's business address unless otherwise directed.
- .4 Notify the Consultant in writing at time of submission of deviations in samples from the requirements of the Contract Documents.
- .5 Make changes in samples, which the Consultant may require, consistent with the Contract Documents.
- .6 Submit full range of colour chart when degree of pattern or color cannot be represented by a single sample.
- .7 Include cost of delivery and handling, assembly and return of samples to supplier where applicable.

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

.4 If samples are not approved, all samples will be returned for further sample submission by the Contractor. If samples are approved, one (1) sample for the Contractor's record and one (1) sample for the Subcontractor's or supplier's record will be returned marked "reviewed and accepted as noted."

.5 When samples are too large and impractical for delivery or assembly to the Consultant's office, deliver to the site or to another location agreed to by the Contractor and Subcontractor or supplier, but only with prior notification and approval by the Consultant.

.6 Approved samples will become the standard of workmanship and material against which installed Work will be checked.

.7 Each product incorporated in the Work to be precisely the same in all details as the "final reviewed and accepted sample'.

5.0 PHOTOGRAPHS

.1 Provide digital photographs in a format acceptable to the Owner showing standard progress of the work at monthly intervals during the work.

.2 Photographs shall show a minimum of six (6) different views of the work.

6.0 EXTENDED WARRANTIES

.1 Submit to the Consultant all extended certificates or written warranties as specified in each application selection of the specifications.

.2 Where Work is performed by Contractor's Subcontractors and when written warranties are required, secure such warranties from the Subcontractor and provide to the Consultant on or before Substantial Performance or Total Performance of the project.

7.0 DOCUMENTATION SUBMITTALS

.1 The following is a consolidated checklist provided for convenience only and shall not limit in any manner whatsoever the requirements of the General Conditions and amendments thereto under the Supplementary Conditions.

.2 The following shall be submitted within five (5) days of award of contract:
- .1 A complete Construction schedule.
- .2 The Construction schedule shall show project milestones such as shop drawings, demolition, installation, labeling, testing dates, substantial completion, training, manuals, as-built drawings and project closeout for individual systems in various work areas.

.3 The following shall be submitted within ten (10) days after award of contract:
- .1 A proposed format for commissioning and verification reporting of each mechanical and electrical system.

.4 The following documentation shall be submitted by the Contractor with the application for first payment under the Contract:
- .1 Workers' Compensation Board letter stating that the Contractor and all Subcontractors are in good standing.
- .2 Copies of all permits.
- .3 Sample of proposed statutory declaration forms and list of corporate signing officers.
- .4 Predicted cash flow requirement for the various certificate of payment stages.
- .5 Samples submittal schedule.
- .6 Shop drawings submittal schedule.
- .7 Statement regarding outstanding claims.

.5 The following shall be submitted by the Contractor with each subsequent payment under the contract.
- .1 CCDC 9A Statutory and Declaration.
- .2 Updated Construction Schedule.
- .3 Photographs of the work.

.6 During progress of the Work, the following documentation shall be provided by the Contractor:
- .1 Copies of test reports
- .2 Copies of inspection reports.
- .3 Records of the progress of the Work.
- .4 Revised construction progress schedule as part of each month-end report.
- .5 Copies of all permits, licenses, and certificates.
- .6 Daily record (at weekly intervals).
- .7 Updated Construction Schedules.
- .8 Photographs of work.

.7 The following documentation shall be provided by the Contractor prior to certification of Substantial Performance of the Work.
- .1 Reconciliation of all change orders.
- .2 Workers' Compensation Board letter stating the Contractor and all Subcontractors are in good standing.
- .3 Manufacturers' guarantees and warranties, manufacturers' or associations' maintenance recommendations, maintenance manuals and operating instructions, as specified.
- .4 All reserve, maintenance and replacement materials as required under the various sections of the specifications.
- .5 Mechanical testing, balancing and checking of equipment and systems as specified.
- .6 Plumbing testing and checking of equipment and systems as specified.
- .7 Certificate from local authority approving the plumbing and sprinkler systems installations.
- .8 Fire Alarm Verification Certificate
- .9 Certificates for cleaning duct systems, chemical cleaning and treatment of piping systems.
- .10 Certificate from the authority approving electrical installation.
- .11 Certificate from provincial authority approving the installation of boilers and pressure vessels, if applicable.
- .12 Confirmation by Contractor all exit signs and emergency lights and manual pull stations are operational.
- .13 Occupancy permits from the local authority for completed areas of the Project.
- .14 Operating Maintenance Manuals and Product Maintenance Manuals.
- .15 Red-lined As-Built drawings.

.8 The following documentation shall be provided by the Contractor prior to Total performance of the Work being certified by the consultant:
- .1 Letter from Workers' Compensation Board stating that Contractor and all Subcontractors are in good standing.
- .2 Verification that no liens are registered against the Site.
- .3 Certification, acceptable to the Owner, stating that all taxes, Employment Insurance payments, Canada Pension Plan contributions, duties, royalties and all other monies required to be paid by law or statute have been paid in full by the Contractor and Subcontractors and other parties as applicable.
- .4 Establish methods and procedures of work and control necessary to provide the effective application of planning to progress of the Work.
- .5 Final Statement Regarding outstanding Claims.

END OF SECTION 01 33 00

1.1 GENERAL

.1 The Contractor shall be responsible for the safety of all persons and property on or about the Work and for ensuring that the Work is performed in accordance with all applicable safety requirements.

Without in any way limiting the generality of the foregoing, the Contractor shall comply fully with the following provisions

.1 Observe and enforce construction safety measures of the National Building Code of Canada, the Workers' Compensation Act, The Workplace Safety and Health Act, The Department of Labour, Municipal Statues, Bylaws and any other authorities applicable to this project. The Contractor is responsible for compliance with these standards for all workers engaged in the work of this Contract.

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

.3 Provide at least seventy-two (72) hours written notice to all utility companies and property owners in the immediate vicinity of his operations prior to the commencement of construction and shall, if requested, cooperate with such parties in the protection, removal or relocation of their installations and property.

.4 Develop, maintain and supervise for the duration of the work a comprehensive safety program that will effectively incorporate and implement all required safety precautions. The program shall, as a minimum, respond fully to the requirements of all applicable laws, ordinances, rules, regulations and orders and general construction practices for the safety rules and regulations of the Owner and any Workers' Compensation of Occupational Health and Safety legislation or regulations that may be applicable (e.g. WHMIS)

.5 Supply and maintain, at his own expense, at his site office or other well known place at the job site, safety equipment necessary to protect the workers and general public against accident or injury as prescribed by the governing authorities.

.6 Hold regular safety meetings. Such meetings shall occur not less than once per week. The Contractor will record the minutes of such meetings and maintain a complete file for review for review by the appropriate authorities.

.7 Designate a safety officer who shall be qualified and authorized to supervise and enfore compliance with the safety program.

.8 Report in writing to the Owner and the Consultant all accidents of any sort arising out of or in connection with the performance of the Work whether on or adjacent to the job site, giving full details and statements of witnesses. If death or serious injuries or damages are caused, the accident shall be promptly reported by the Contractor to the Owner and the Consultant by telephone or messenger in addition to any reporting required under provincial laws and regulations.

.9 If a claim is made by anyone against the Contractor or any subcontractor on account of any accident, the Contractor shall promptly report the facts in writing to the Owner and the Consultant, giving full details of the claim.

.10 Night work will be performed by the Contractor only if permission is given beforehand by the appropriate authorities. When work is carried out at night, the Contractor shall supply a sufficient number of electric or other approved lights to enable the work to be done in a safe and satisfactory manner.

.11 Perform all work in a fire-safe manner and comply with all applicable governmental legislation and, without limiting the generality of the foregoing, shall supply and maintain at the job site adequate and proper fire fighting equipment.

1.2 WORK IN HAZARDOUS AREAS

.1 Before commencing the day's work and while working in areas, which may contain an explosive, toxic or oxygen deficient atmosphere, the Contractor shall test for explosive or toxic gases or oxygen deficiency. If a hazardous condition is found, the Contractor shall make the work area safe before commencing or continuing the work.

.2 Use non-sparking tools in areas where an explosive atmosphere may exist.

.3 Provide, mount and maintain signs warning all of the hazards and of the proper procedures required for working in the hazardous areas.

1.3 OVERLOADING

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

1.4 GENERAL SAFETY REQUIREMENTS

.1 Promote and manage accident prevention programs, and provide safety and job instruction training. Provide written safety regulations to all workers.

.2 The Owner expects excellence in health and safety performance through the support and active participation of all Contractors, Subcontractors, and workers providing services on the project. All levels of management are responsible and accountable for providing a safe work environment with proper equipment, procedures, training and programs, and all workers must accept their responsibility in complying with health and safety legislation, rules and procedures, and to work in a manner which safeguards themselves and co-workers on the project.

.3 All tools and equipment must comply with standards and regulations having jurisdiction at the work site. The Contractor assumes all risks for the use of same. This applies for the duration of the project.

.4 All openings must be guarded with proper barricades or appropriate covers with warning identification.

.5 Guy wires erected by the Contractor must be identified with attached warning signs.

.6 All temporary heaters, lights and power cables, etc. must comply with the requirements of the Canadian Electrical Code and applicable regulations.

.7 Use proper entrances and routes in proceeding directly to the work under this contract, and avoid passing through other operating locations on the project.

.8 Wear appropriate protective clothing suitable for the task to cover and protect the body.

.9 Safety glasses with face shields or other suitable eye protection must be worn when engaged in work where they will be subjected to flying objects, injurious light or heat rays, or any materials liable to injure or irritate the eyes.

.10 All persons on the job site must wear CSA approved Industrial Headwater and CSA approved Protective Footwear.

.11 Safety harness must be used where work platforms or staging complete with guardrails is impractical.

.12 Scaffolding, swing stages or other temporary work platforms must be constructed and maintained, and used in compliance with Safety Regulations.

.13 Approved containers used to store drinking water must be clearly marked and must not be used for any other purpose.

.14 Provide for the use of the Owner or the Consultant safety equipment such as ropes, safety belts, and combustible/ hazardous gas and oxygen depletion meter. Provide casual labour to the Owner or Consultant's staff when entry is required to manholes or other areas, which may be hazardous. The Owner or Consultant is not allowed to enter such areas alone.

.15 Instruct all workers in the emergency procedures established for the work site and their required regulations.

.16 Only authorized workers are permitted to operate, adjust and repair equipment. No unattended equipment should be left running.

.17 Alcohol and unauthorized drugs are prohibited on the property of the work site. Personnel using a medically prescribed drug may impair performance or judgment and must inform their supervisor in order that tasks may be assigned to ensure worker safety is considered.

.18 A standby worker must be located immediately outside of a confined space area to render assistance in the event of an unsafe or emergency condition, and all workers inside a confined space must wear a safety lifeline where a harmful atmosphere exists or may develop. An appropriate communication system must also be maintained between the standby worker and the inside worker(s).

END OF SECTION 01 35 23

1.0 GENERAL

1.1 DEFINITIONS

.1 Regulatory requirements means laws, by-laws, ordinances, rules, regulations, codes, orders of authorities having jurisdiction, and other legally enforceable requirements applicable to the Work and which are or become in force during the performance of the Work.

1.2 REGULATORY REQUIREMENTS

.1 Except as otherwise specified, Contractor shall apply for, obtain, and pay all fees associated with, permits, licenses, certificates, and approvals required by regulatory requirements and the Contract Documents, based on General Conditions of Contract and the following:

.1 Regulatory requirements and fees in force on date of Bid submission, and,

.2 Any change in regulatory requirements or fees scheduled to become effective after date of tender submission and of which public notice has been given before date of tender submission.

.2 Owner will obtain permanent easements and rights of servitude that may be required for performance of the work.

.3 Contractor shall give all notices required by regulatory requirements.

2.0 PRODUCTS

2.1 CONTRACT DOCUMENTS

.1 Contractor shall not be responsible for verifying that Contract Documents comply with regulatory requirements.

.2 If Contract Documents are at variance therewith, or changes that require modification to Contract Documents are made to regulatory requirements, by authorities having jurisdiction, subsequent to date of bid closing, Contractor shall notify Consultant in writing, requesting direction, immediately such variance or change becomes known to him.

.3 Owner may make changes required to Contract Documents, and any resulting change in Contract Price or Contract Time will be made in accordance with the General Conditions of Contract.

.4 If Contractor fails to notify Consultant in writing and obtain Owner's direction as required in paragraph 2.1.2 above and performs work knowing it to be contrary to regulatory requirements, Contractor shall be responsible for and shall correct violations thereof and shall bear costs, expenses and damages attributable to his failure to comply with provisions of such regulatory requirements.

2.2 BUILDING CODE

.1 Conform to and perform work in accordance with the Vancouver Building Bylaw 2014, except as otherwise indicated in Contract Documents.

2.3 PERMITS

.1 Building Permit:

.1 Owner has applied and paid for building permit. Contractor is responsible for obtaining or coordinating all other permits required for the Work and its various parts.

.1 Contractor will require that specific Subcontractors obtain and pay for permits required by the authorities having jurisdiction, where their work is affected by work requiring permits.

.2 Contractor will display the building permit and such other permits in a conspicuous location at the Place of the Work.

.2 Occupancy Permits:

.1 Where required by authority having jurisdiction, Contractor shall apply for, obtain, and pay for occupancy permits, including partial occupancy permits.

.2 Where Contract Document deficiencies are required to be corrected in order to obtain occupancy permits, including partial occupancy permits, Consultant will issue appropriate instructions to the Contractor for correction to the Work.

.3 Contractor shall correct deficiencies in accordance with Consultant's instructions. Where deficiency is not corrected, the Owner reserves the right to make the correction and charge the Contractor for costs incurred.

.3 Contractor will turn occupancy permits over to Owner after all Subcontractors have completed their portions of the Work.

END OF SECTION 01 41 10

1.0 GENERAL

1.1 RELATED SECTIONS

.1 Section 00 20 00 – Instructions to Bidders: Requests for substitutions during bidding period.

1.2 PRODUCT OPTIONS

.1 For products specified only by referenced standards and performance criteria, select any product that meets or exceeds the standard.

.2 For products specified by naming “Acceptable Materials”, select any product named.

.1 The term “Acceptable Materials” is used to specify products by trade name, manufacturer, catalogue number, model number, or similar reference.

.2 The term “Acceptable Materials” shall be deemed to establish the standard of acceptance that the Consultant will consider appropriate for the Work.

.3 Where a list of “Acceptable Materials” exists in the technical specification sections, any one of the specified products may be used to establish the Bid Price.

.3 Where the specification provides for selection of an option that is not consistent with the drawings and schedules (as in the case of a piece of equipment which differs from the equipment detailed in dimensions, service requirements, loads imposed on structures, etc.), and the Contractor elects to use that option, they then agree to coordinate the installation of the selected option into the Work, making such changes in the Work as may be required to accommodate the option and will bear costs and waive claims for additional compensation for costs that subsequently become apparent arising out of the option, including costs of the Consultant’s re-design, and preparation of drawings and details.

.4 For use of products other than those specified, refer to 1.3 below.

1.3 SUBSTITUTIONS

.1 Submit proposals for substitution only in writing in accordance with the Instructions to Bidders.

.2 Contractor will assemble requests for Substitutions requested by Subcontractors and submit to the Consultant for review.

.3 Consultant will review the substitute products with the Owner for acceptability within five (5) days after receipt of Proposed Substitutions.

.4 Consultant is not obliged to accept any Proposed Substitution offered by the Subcontractor. The Consultant reserves the right to dismiss any item with no further explanation.

.5 Accepted Proposed Substitutions will be provided in an addendum prior to tender closing.

.6 Completed list of substitutions must include statements of respective costs of items originally specified and proposed substitutions.

.7 Consultant may consider proposal if:

.1 Products selected by Contractor from those specified are not reading available.

.2 Delivery date of products selected from those specified would unduly delay completion of Contract.

.3 Different products or construction methods to those specified that are considered by the Contractor as performing in a manner similar to, or superior to those specified.

.4 Verification that the substitute products can be obtained, meet the performance required for the project, and meet requirements of the Vancouver Building Bylaw 2014, and area acceptable to the Owner and are part of it’s standards.

.8 Include with Proposed Substitutions:
- .1 Complete data substantiating compliance of the proposed substitute with contract requirements.
- .2 Substitute Products, provide the following:
  - .1 Product identification, including manufacturer's name and address;
  - .2 Manufacturer's literature, including product description, performance and test data, reference standards, and limitations
  - .3 Comparison of properties to specified products;
  - .4 Samples if appearance is relevant;
  - .5 Names and addresses of similar projects where the product has been used.
- .3 Substitute Construction Methods, provide the following:
  - .1 Detailed description of the proposed method, and drawings illustrating it.
  - .2 Itemized comparison of proposed substitution with product or method specified.
  - .3 Data relating to changes in schedule.
  - .4 Detailed description of modifications required by proposed substitution to adjacent materials and configurations (if any).
- .4 Verification that product complies with the Vancouver Building Bylaw 2014.

.9 Should Proposed Substitution be found acceptable by the Consultant and the Owner, in part or in whole, the Contractor shall:
- .1 Assume full responsibility and costs when substitution affects any other Work,
- .2 Ensure that drawings incorporating and coordinating aspects of affected Work bear the seal and signature of an Architect or Engineer registered in Province of the Work.

.10 In making a proposal for substitution the Contractor represents:
- .1 That it has personally investigated the proposal and (unless the proposal explicitly states otherwise) determined that it performs in a similar way or is superior to the product or method specified;
- .2 That the same guaranty will be furnished as for the originally specified product or construction method;
- .3 That it will coordinate installation of the accepted substitute into the Work, making such changes in the Work as may be required to accommodate the change;
- .4 That it will bear costs and waives claims for additional compensation for costs that subsequently become apparent arising out of the substitution;
- .5 That the quotation is complete and includes related costs.

.11 The Consultant reserves the right to disregard any requests for substitutions submitted after the tender closes and that are not presented in with the information requested in 1.3.8 above.

.12 Substitutions will not be considered that are implicit in submitted shop drawings and samples rather than formally presented proposals as described above.

.13 Substitutions will not be considered which require substantial changes in the Contract Documents.

.14 No substitutions will be permitted without Consultant's written acceptance and issued as an addendum. Where substitutions are found in the Work that have not been formally accepted by the Consultant, the Contractor will be required to remove such products and replace with specified materials or provide a credit to the value of the contract at the Consultant's discretion.

.15 Substitutions will not be considered that arise from negligence in ordering specified product in proper advance time considering place of origin of product, normal method of delivery and manufacturers ordering requirement. In the case of the preceding, Consultant will either select a substitute product or recommend that extraordinary delivery methods be utilized to deliver specified product at no additional cost to the Owner.

END OF SECTION 01 62 00

1.0 GENERAL

1.1 COORDINATION

.1 Contractor shall coordinate Owner supplied products and services which includes but not limited to appliance furniture an IT services with the Construction Schedule for delivery dates.

.2 Contractor shall coordinate with the Owner for installation of Owner installed items, blocking and servicing requirements and confirm dimensional requirements for items being built-in or attached to Contractor work.

.3 Contractor shall coordinate Owner supplied products, installed by Contractor for installation requirements, blocking and servicing requirements and confirm dimensional requirements for items being built-in or attached to Contractor's work.

2.0 PRODUCTS

2.1 OWNER'S WORK

.1 Owner's work will include supply and installation of appliance as indicated on drawings, supply and installation of furniture, and provision of IT services from 3/F server room to 6/F IT closet.

3.0 EXECUTION

3.1 PREPARATION

.1 Contractor shall provide all necessary framing, support and blocking to receive Owner's Work, all services roughing-in, in accordance with reviewed shop drawings, which will be later, supplied by the Owner, at no additional cost to the Contract.

END OF SECTION 01 65 00

1.0 GENERAL

1.1 SUMMARY

.1 This Section includes procedural requirements for cutting and patching.

1.2 RELATED SECTIONS

.1 Section 07 80 00 – Firestopping and Smokeseals: Through penetration firestop systems for patching fire rated construction.

.2 Requirements in this Section apply to all other divisions of work, mechanical and electrical installations. Refer to mechanical and electrical drawings for other requirements and limitations applicable to cutting and patching mechanical and electrical installations.

1.3 DEFINITIONS

.1 **Cutting:** Removal of existing construction necessary to permit installation or performance of other Work.

.2 **Patching:** Fitting and repair work required to restore surfaces to original conditions after installation of other Work.

1.4 SUBMITTALS

.1 Cutting and Patching Proposal: Submit a proposal describing procedures at least 10 days before the time cutting and patching will be performed, requesting approval to proceed.

.2 Include the following information on the request:

- .1 Extent: Describe cutting and patching, show how they will be performed, and indicate why they cannot be avoided.
- .2 Changes to Existing Construction: Describe anticipated results. Include changes to structural elements and operating components as well as changes in the work's appearance and other significant visual elements.
- .3 Products: List products to be used and firms or entities that will perform the Work.
- .4 Dates: Indicate when cutting and patching will be performed.
- .5 Utilities: List utilities that cutting and patching procedures will disturb or affect. List utilities that will be relocated and those that will be temporarily out of service. Indicate how long service will be disrupted.
- .6 Consultant's Acceptance: Obtain acceptance of cutting and patching proposal before cutting and patching. Review and acceptance of cutting and patching proposal does not waive right to later require removal and replacement of unsatisfactory work.

1.5 QUALITY ASSURANCE

.1 Structural Elements: Do not cut and patch structural elements in a manner that could change their load carrying capacity or load deflection ratio.

.2 Operational Elements: Do not cut and patch operating elements and related components in a manner that results in reducing their capacity to perform as intended or that results in increased maintenance or decreased operational life or safety, including but not limited to the following:

- .1 Primary operational systems and equipment
- .2 Air or smoke barriers.
- .3 Fire protection systems.
- .4 Control systems.
- .5 Communication systems.
- .6 Electrical wiring systems.

.3 Miscellaneous Elements: Do not cut and patch the following elements or related components in a manner that could change their load carrying capacity, that results in reducing their capacity to perform as intended, or that results in increased maintenance or decreased operational life or safety, including but not limited to the following:
- .1 Equipment supports
- .2 Piping, ductwork and equipment
- .3 Noise and vibration control elements and systems

.4 Visual Requirements: Do not cut and patch construction in a manner that results in visual evidence of cutting and patching. Do not cut and patch construction exposed on the exterior or in occupied spaces in a manner that would, in Consultant's opinion, reduce the building's aesthetic qualities. Remove and replace construction that has been cut and patched in a visually unsatisfactory manner. If possible, retain original Installer or fabricator to cut and patch exposed Work listed below. If it is impossible to engage original Installer or fabricator, engage another recognized, experienced, and specialized firm, including but not limited to the following:
- .1 Ornamental metal
- .2 Matched veneer woodwork
- .3 Firestopping and smokeseals
- .4 Finished flooring
- .5 Finished coatings
- .6 Wall covering
- .7 HVAC enclosures, cabinets, or covers

.5 Cutting and Patching Conference: Before proceeding, meet at Project site with parties involved in cutting and patching, including mechanical and electrical trades. Review areas of potential interference and conflict. Coordinate procedures and resolve potential conflicts before proceeding.

1.6 WARRANTY

.1 Existing Warranties: Remove, replace, patch, and repair materials and surfaces cut or damaged during cutting and patching operations, by methods and with materials so as not to void existing warranties.

2.0 PRODUCTS

2.1 MATERIALS

.1 General: Comply with requirements specified in other Sections of these Specifications.

.2 Existing Materials: Use materials identical to existing materials. For exposed surfaces, use materials that visually match existing adjacent surfaces to the fullest extent possible:
- .1 If identical materials are unavailable or cannot be used, use materials that, when installed, will match the visual and functional performance of existing materials.

3.0 EXECUTION

3.1 EXAMINATION

.1 Examine surfaces to be cut and patched and conditions under which cutting and patching are to be performed:
- .1 Compatibility: Before patching, verify compatibility with and suitability of substrates, including compatibility with existing finishes or primers.
- .2 Proceed with installation only after unsafe or unsatisfactory conditions have been corrected.

3.2 PREPARATION

.1 Temporary Support: Provide temporary support of Work to be cut in accordance with Section 01 15 00 – Temporary Facilities.

.2 Protection: Protect existing construction during cutting and patching to prevent damage. Provide protection from adverse weather conditions for portions of Project that might be exposed during cutting and patching operations.

.3 Adjoining Areas: Avoid interference with use of adjoining areas or interruption of free passage to adjoining areas.

.4 Existing Services: Where existing services are required to be removed, relocated, or abandoned, bypass such services before cutting to minimize interruption of services to occupied areas.

3.3 PERFORMANCE

.1 General: Employ skilled workers to perform cutting and patching. Proceed with cutting and patching at the earliest feasible time, and complete without delay:

.1 Cut existing construction to provide for installation of other components or performance of other construction, and subsequently patch as required to restore surfaces to their original condition.

.2 Cutting: Cut existing construction by sawing, drilling, breaking, chipping, grinding, and similar operations, including excavation, using methods least likely to damage elements retained or adjoining construction. If possible, review proposed procedures with original Installer; comply with original Installer's written recommendations:

.1 In general, use hand or small power tools designed for sawing and grinding, not hammering and chopping. Cut holes and slots as small as possible, neatly to size required, and with minimum disturbance of adjacent surfaces. Temporarily cover openings when not in use.

.2 Existing Finished Surfaces: Cut or drill from the exposed or finished side into concealed surfaces.

.3 Concrete or Masonry: Cut using a cutting machine, such as an abrasive saw or a diamond core drill.

.4 Mechanical and Electrical Services: Cut off pipe or conduit in walls or partitions to be removed. Cap, valve, or plug and seal remaining portion of pipe or conduit to prevent entrance of moisture or other foreign matter after cutting.

.5 Proceed with patching after construction operations requiring cutting are complete.

.3 Patching: Patch construction by filling, repairing, refinishing, closing up, and similar operations following performance of other Work. Patch with durable seams that are as invisible as possible. Provide materials and comply with installation requirements specified in other Sections of these Specifications:

.1 Inspection: Where feasible, test and inspect patched areas after completion to demonstrate integrity of installation.

.2 Exposed Finishes: Restore exposed finishes of patched areas and extend finish restoration into retained adjoining construction in a manner that will eliminate evidence of patching and refinishing.

.3 Floors and Walls: Where walls or partitions that are removed extend from one finished area into another, patch and repair floor and wall surfaces in the new space. Provide an even surface of uniform finish, colour, texture, and appearance. Remove existing floor and wall coverings and replace with new materials, if necessary, to achieve uniform colour and appearance:

.1 Where patching occurs in a painted surface, apply primer and intermediate paint coats over the patch and apply final paint coat over entire unbroken surface containing the patch. Provide additional coats until patch blends with adjacent surfaces.

.4 Ceilings: Patch, repair, or re-hang existing ceilings as necessary to provide an even plane surface of uniform appearance.

END OF SECTION 01 73 29

1.0 GENERAL

1.1 PROJECT CLEANLINESS

.1 Maintain Work in tidy condition, free from accumulation of waste products and debris, including that caused by Project Owner or other Contractors.

.2 Remove waste materials from site at daily regularly scheduled times or dispose of as directed by Project Owner. Do not burn waste materials on site, unless approved by Project Owner.

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

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

.5 Provide on-site containers for collection of waste materials and debris.

.6 Provide and use marked separate bins for recycling. Refer to Section 01 74 19 - Waste Management.

.7 Dispose of waste materials and debris off site.

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

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

.10 Provide adequate ventilation during use of volatile or noxious substances. Use of building ventilation systems is not permitted for this purpose.

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

1.2 FINAL CLEANING

.1 When Work is Substantially Performed 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 Remove waste products and debris including that caused by Project Owner or other Contractors.

.5 Remove waste materials from site at regularly scheduled times or dispose of as directed by Project Owner. Do not burn waste materials on site, unless approved by Project Owner.

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

.7 Clean and polish glass, mirrors, hardware, wall tile, stainless steel, chrome, plastic laminate, and

mechanical and electrical fixtures. Replace broken, scratched or disfigured glass.

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

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

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

.11 Wax, seal, shampoo or prepare floor finishes, as recommended by manufacturer.

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

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

.14 Clean tenant side of existing windows and glass.

END OF SECTION 01 74 11

1.0 GENERAL

1.1 WASTE MANAGEMENT GOALS FOR THE PROJECT

.1 The Owner has established that this Project shall generate the least amount of waste possible and that processes shall be employed that ensure the generation of as little waste as possible including prevention of damage due to mishandling, improper storage, contamination, inadequate protection or other factors as well as minimizing over packaging and poor quantity estimating.

.2 Of the inevitable waste that is generated, the waste materials designated in this specification shall be salvaged for reuse and or recycling. Waste disposal in landfills or incinerators shall be minimized. On new construction projects this means careful recycling of job site waste, on demolition projects this also means careful removal for salvage.

1.2 SECTION INCLUDES

.1 Submission and implementation of a Project Waste Management Plan.

1.3 RELATED SECTIONS

.1 All Sections

1.4 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-modeling, 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 remanufactured into a new product for reuse by others.

.7 Recycle: To remove a waste material from the Project site to another site for remanufacture 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's): Chemical compounds common in and emitted by many building products over time through outgassing:

.17 Solvents in paints and other coatings;

.18 Wood preservatives; strippers and household cleaners;

.19 Adhesives in particleboard, fibreboard, and some plywood; and foam insulation.

.20 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.

.21 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.

.22 Waste Management Plan: A Project-related plan for the collection, transportation, and disposal of the waste generated at the construction site. The purpose of the plan is to ultimately reduce the amount of material being landfilled.

1.5 CODE OF PRACTICE

.1 In addition to other requirements specificed herein it is a requirement for the Work of this project that the Contractor comply with Metro Vancouver's "3Rs Code of Practice for the Building Industry". Refer also to "Construction Waste Management: A Guide for Builders and Developers" and "Demolition & Salvage: A Guide for Project Managers and Contractors." All documents are available from Metro Vancouver, Sustatinable Business Services Division, Telephone: 604-451-6575. Website address: www.metrovancouver.org/buildsmart.

1.6 REGULATORY REQUIREMENTS

.1 Conform to applicable codes and regulations for disposal and removal of common and hazardous waste. Handle and dispose of all hazardous and banned materials in accordance with the BC Waste Management's Act and Special Waste Regulation, and regional and municipal regulations. These hazardous and banned materials include but are not limited to asbestos, drywall (banned from disposal), underground storage tanks, Polychlorinated Biphenyl's (PCBs), abandoned chemicals (gasoline, pesticides, herbicides, flammable and combustible substances), freon from cooling equipment, lead-based paints, smoke detectors, and mercury containing switches.

.2 Licensed facilities: Only those brokerage, storage, transfer and disposal facilities which comply with the requirements of the "Greater Vancouver Sewerage and Drainage District Municipal Solid Waste and Recyclable Material Regulatory Bylaw No. 181, 1996 as amended by Bylaw 183, 1996" and those licensed by other jurisdictions shall be used by the Contractor for the recycling and disposal of waste materials generated at deconstruction and renovation projects. For a listing of licensed facilities, contact the Metro Vancouver Solid Waste Regulatory program at 604-436-6777.

.3 The following materials are banned from the Garbage within Metro Vancouver, effective January 1, 2008:
- .1 Corrugated cardboard.
- .2 Newsprint
- .3 Office paper
- .4 Electronic waste (including personal computers, printers & TVs)
- .5 Refundable beverage containers (excluding milk cartons)
- .6 Blue box recyclables (including glass, metal, and plastic Type 1, 2, 4 & 5 containers)
- .7 Product Stewardship (Take Back) Program materials include:
  - .1 Paint, solvent, flammable liquids, gasoline and pesticides.
  - .2 Oil, oil filters and empty containers
  - .3 Medications, pharmaceuticals
  - .4 Lead-add (car) batteries
  - .5 Tires
- .8 Yard and garden waste
- .9 Gypsum drywall

1.7 WASTE MANAGEMENT PLAN

.1 Waste Management Plan: Within 10 calendar days after receipt of Notice of Award of Contract, or prior to any waste removal, whichever occurs sooner, the Contractor shall submit to the Owner and Consultant a Waste Management Plan. Attached is a sample format together with sample waste generation rates to aid the Contractor in formulating the Plan. The Contractor may use this form or provide a custom form containing the same information. The Plan shall contain the following:
- .1 Analysis of the proposed job site waste to be generated, including the types of recyclable and waste materials generated (by volume or weight). In the case of demolition, a list of each item proposed to be salvaged during the course of the project should also be prepared. (Refer to www.metrovancouver.org/buildsmart for a directory of service providers. This list is not necessarily complete. The Contractor may use any of these or other service providers).
- .2 Alternatives to Landfilling: Contractor shall designate responsibility for preparing a list of each material proposed to be salvaged, reused, or recycled during the course of the Project.
- .3 List of compulsory materials to be recycled, shall include, at minimum, the following materials:
  - .1 Old corrugated cardboard
  - .2 Clean dimensional wood, palette wood
  - .3 Concrete/Brick/Concrete Block/Asphalt
  - .4 Scrap Metal
  - .5 Drywall
  - .6 Paint (return to Paint Depot)
- .4 List of additional optional materials to be recycled:
  - .1 Fluorescent Tubes
  - .2 Land clearing Debris
- .5 List of Materials to be Salvaged:
  - .1 Dimensioned Lumber and Heavy Timbers
  - .2 Wood siding

.3 Structural Steel
.4 Wood Paneling, molding, trim and Wainscoting
.5 Heritage architectural elements such as mantle pieces, columns, etc
.6 Cabinets and casework
.7 Insulation
.8 Brick and block
.9 Electrical Equipment and Light Fixtures
.10 Plumbing fixtures and brass
.11 Windows, doors and frames
.12 Hardwood flooring

.2 Meetings: Contractor shall conduct Project Waste Management meetings. Meeting shall include subcontractors affected by the Waste Management Plan. At a minimum, waste management goals and issues shall be discussed at the following meetings:
.1 Pre-bid meeting
.2 Pre-construction meeting
.3 Regular job-site meetings

.3 Materials Handling Procedures: prevent contamination of materials to be recycled and salvaged and handle materials consistent with requirements for acceptance by designated facilities. Where space permits, source separations recommended. Where materials must be co-mingled they must be taken to a processing facility for separation off site.

.4 Transportation: The Contractor may engage a hauling subcontractor or self haul or make each subcontractor responsible for their own waste. In any case compliance with these requirements is mandatory.

.5 If requested submit, to the Consultant and/or Owner waybills, invoices and other documentation confirming that all materials have been hauled to the required locations.

.6 Waste Management Plan Implementation:
.1 Manager: The Contractor shall designate an on-site party (or parties) responsible for Instructing workers and overseeing and documenting results of the Waste Management Plan to the Job Site Foreman, each Subcontractor, the Owner, and the Consultant.
.2 Distribution: The Contractor shall distribute copies of the Waste Management Plan to the Job Site Foreman, each Subcontractor, the Owner, and the Consultant.
.3 Instruction: The Contractor shall provide on-site instruction of appropriate separation, handling, and recycling to be used by <u>all</u> parties at the appropriate stages of the Project. On demolition projects the Contractor shall provide on-site instructions for salvage and requirements for reusing salvaged materials within the project, either in new construction or in a renovation.
.4 Separation Facilities: The Contractor shall lay out and label a specific area to facilitate separation of materials for recycling and salvage. Recycling and waste bin areas are to be kept neat and clean and clearly marked in order to avoid contamination of materials. The requirement for separation will only be waived if the Contractor can demonstrate to the Owner/Consultant that there is insufficient room to accommodate it. If this is the case the materials must be sent to a processing facility for separation off site.
.5 Application for Progress Payments: The Contractor shall submit with <u>each Application for Progress Payment</u> a summary of waste materials, recycled, salvaged and disposed of by the Project using the form appended to this specification or a form generated by the Contractor containing the same information. Failure to submit this information shall render the Application for Payment incomplete and shall delay Progress Payment. The Summary shall contain the following information:
For each material salvaged and recycled from the Project, include the amount (in cubic yards or tonnes or in the case of salvaged items state quantities by number, type and size

of items) and the destination (i.e. recycling facility, used building materials yard). For each material land filled or incinerated from the Project, include the amount (in cubic yards or tonnes) of material and the identity of the landfill, incinerator and/or transfer station.

2.0 PRODUCTS

.1 Not Applicable

3.0 EXECUTION

.1 Construction Projects – Waste Generation Rates

	Residential/Commercial High-rise Construction		**Institutional Low-rise Construction**		**Commercial Low-rise Construction**		**Residential Low-rise Construction**	
Material	**Cu.yd./ 1,000 sq.ft.**	**Tonnes/ 1,000 sq.ft.**	**Cu.yd/ 1,000 sq.ft.**	**Tonnes/ 1,000 sq.ft.**	**Cu.yd./ 1,000 sq.ft.**	**Tonnes/ 1,000 sq.ft.**	**Cu.yd./ 1,000 sq.ft.**	**Tonnes/ 1,000 sq.ft.**
Wood	3.3	0.40	7.0	0.86	5.6	0.68	6.0	0.73
Drywall	3.6	0.92	0.9	0.22	0.2	0.05	1.1	0.27
Metal	0.2	0.09	0.4	0.21	--	--	--	--
Concrete/ Asphalt	1.7	1.79	0.7	0.99	--	--	0.04	0.05
Corrugated Cardboard	--	--	--	--	7.1	0.14	2.4	0.05
Other	5.6	1.54	0.2	0.54	1.0	0.27	0.5	0.14
Total	**14.4**	**4.74**	**9.2**	**2.82**	**13.9**	**1.14**	**10.04**	**1.24**

Explanatory note:

Waste generation rates vary depending on project type and size, sub trade efficiency, accurate material estimation, on-site materials storage procedures and product packaging.

Estimate the volumes or quantities of materials generated on the site by multiplying the floor area of your project with the generation rates listed for the different materials.

END OF SECTION 01 74 19

1.0 GENERAL

1.1 RELATED SECTIONS

.1 Summary Section 01 10 00

.2 Submittals Section 01 33 00

.3 Equipment and Systems Demonstration and Training Section 01 79 00

1.2 SUMMARY

.1 This Section includes administrative and procedural requirements for contract closeout, which prior to the application for substantial performance or substantial completion/ completion will be conducted in accordance with a specific take-over process as follows:

.1 Preparation of deficiency list by Contractor.

.2 Preliminary review by Consultant and confirmation of deficiency list.

.3 Interim procedures:

.1 Submission of warranties,
.2 Submission of record drawings,
.3 Submission of operations and maintenance manuals
.4 Submission of maintenance materials and equipment,
.5 Submission of certificates required by Consultant,
.6 Instructions to Owner and Owners personnel,
.7 Completion of final cleaning
.8 Submission of final construction photographs.
.9 Submission of deficiency list indicating items completed, and items outstanding.
.10 Occupancy Permit.

.4 Declaration of Substantial Performance:

.1 Final review by Consultant
.2 Submittal of Declaration of Substantial Performance.
.3 Acceptance by Consultant of Contractor's declaration.
.4 Applications for Final Payment, and administration of Lien Holdback and other holdback amounts.

1.3 DEFICIENCY LIST

.1 Contractor and all Subcontractors shall conduct an inspection of the Work, identify deficiencies and defects and repair these as required to conform to the Contract Documents.

.2 Prepare a list of incomplete items and submit three (3) copies of list to Consultant prior to declaring Substantial Performance. Include name and identification of each space and area affected by construction operations for incomplete items and items needing correction including, if necessary, areas disturbed that are outside the limits of construction:

.1 Organize list of spaces in sequential order.
.2 Organize items applying to each space by major element, including categories for ceiling, individual walls, floors, equipment, and building systems.
.3 Include the following information at the top of each page:

.1 Project name.
.2 Date.
.3 Name of Owner.
.4 Name of Consultant.
.5 Name of Contractor.
.6 Page number.

.4 Include value of items on the list, and reasons why the item of work is incomplete or deficient.

.5 Include space for Consultant's verification check and any additional items that the Consultant may add during preliminary review.

.6 Include space for Contractor's Correction or Completion Date.

.7 A suggested format is as follows, prepared on Contractor's Letterhead:

Item Number	Room Number	Location (Area)	Description	Value ($)	Value ($) x 2	Correction / Completion Date	Consultant's Verification Check
1	W211	Room Name	Description of damage or deficiency. Cause of damage or deficiency. Recommended correction or completion procedure.	Accurate value of repair or rectification		Filled in when completed	Consultant will check during final review

.8 The accurate value for the repair or rectification of the deficiency shall be multiplied by a factor of 2 (2 times or 200%) in determining the total deficiency.

.9 Include in the deficiency cost all outstanding As-built documents, and project manuals. The value (as multiplied by 2) of the As-built documents and manuals will not be less than 3% of the work and 3% for the specific trade/subcontractor work.

1.4 PRELIMINARY REVIEW

.1 Consultant will conduct a preliminary review after receipt of deficiency list and confirm contents, and may list additional items arising from preliminary review.

.2 Modifications to the deficiency list will be discussed with the Contractor. Contractor will be requested to update list to reflect changes arising from preliminary review ready for request for final review.

1.5 INTERIM PROCEDURES

.1 Prior to requesting final review, the Contractor shall undertake the following items in preparation for declaration of Substantial Performance.

.2 Submit a written certificate to Consultant that the following have been performed:

.1 Work has been completed and inspected for compliance with Contract Documents.

.2 Contractor's start-up of equipment and systems, functioning within normal operating parameters.

.3 Defects have been corrected and deficiencies have been completed.

.4 Equipment and systems have been tested, adjusted and balanced and are fully operational.

.5 Certificates required by Boiler Inspection Branch, Fire Commissioner and utility companies and all other authorities having jurisdiction have been submitted.

.6 Completed Operation and Maintenance Data Manuals have been submitted to Consultant.

.7 Preliminary As-built red-line Drawings and Specifications have been completed and submitted to Consultant.

.8 Operation of systems have been demonstrated to Owner's personnel.

.9 Work is complete and ready for Final Review.

.10 Witnessed test results and list of attendees.

.3 Provide or complete the following items for the Owner prior to declaration of Substantial Performance:

.1 Advise Owner of pending insurance changeover requirements.

.2 Submit specific warranties, workmanship bonds, maintenance service agreements, final certifications, and similar documents.

.3 Obtain and submit releases permitting Owner unrestricted use of the Work. Include occupancy permits, operating certificates, and similar releases.

.4 Prepare and submit final As-built red-lined drawings, Project Record Documents, operation and maintenance manuals, final construction photographs and similar final record information.

.5 Deliver tools, spare parts, extra materials, and similar items to location designated by Owner. Label with manufacturer's name and model number where applicable.

.6 Make final changeover of permanent locks and deliver keys to Owner. Advise Owner's personnel of changeover in security provisions.

.7 Complete start-up testing of systems

.8 Submit testing, adjusting and balancing records.

.9 Terminate and remove temporary facilities from Project site, along with mock-ups not forming a part of the final construction, construction tools, and similar elements.

.10 Submit changeover information related to Owner's occupancy, use, operation, and maintenance.

.11 Complete final cleaning requirements, including touch-up painting.

.12 Touch up and otherwise repair and restore marred exposed finishes to eliminate visual defects.

1.6 FINAL REVIEW

.1 Request final review when the Work identified in deficiency list noted as incomplete is completed or corrected. The Consultant and Contractor will make a final review of the Work.

.2 Results of completed review will form the basis of Consultant's acceptance of Certificate of Substantial Performance.

.3 Should the Consultant determine that excessive deficiencies still exist, the final review will cease and the Contractor shall re-start the declaration procedure.

.4 Should the Consultant accept that the Work is substantially performed:

.1 The Consultant will issue an Letter of Acceptance of Contractor Certificate of Substantial Performance which will contain:

.1 Date of Substantial Performance and approval date.

.2 List of items to be completed or corrected.

.3 The time within which the Contractor shall complete or correct the Work of listed items.

.4 The amount of the holdback for deficiencies will be a minimum of 200% (2 times) of the estimated cost to correct the deficiencies.

.5 Signature of:

.a The Consultant.

.b Subconsultants.

.c The Contractor.

.d Owner.

1.7 PROJECT RECORD DOCUMENTS

.1 Submit two (2) copies of operating & maintenance manuals and two (2) copies of record drawings in draft form, prior to request for Substantial Performance.

.2 One copy will be returned after final inspection, with the Consultant's comments. Revise content of documents as required prior to final submittal.

.3 Prior to Final Performance of the Work, submit to the Consultant four (4) final copies of operating and maintenance manuals and two (2) copies & one (1) electronic copy of the record drawings.

.4 Organize data in the form of an instructional manual in binders of commercial quality, 8 ½" x 11", maximum ring size.

.5 Cover: Identify each binder with typed or printed title “Project Record Documents”; list title of Project, identify subject matter of contents.

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

.7 Provide tabbed flyleaf for each separate product and system, with typed description of product and major component parts of equipment.

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

.9 For Each Product or System: List names, addresses and telephone numbers of subcontractors and suppliers, including local source of supplies and replacement parts.

.10 Product Data: Mark each sheet to clearly identify specific products and component parts, and data applicable to installation; delete inapplicable information.

1.8 CONTENTS – EACH VOLUME

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

.2 For each product or system:
- .1 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.

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

.5 Typewritten Text: as required to supplement product data. Provide logical sequence of instructions for each procedure, incorporating manufacturer's instructions specified in Section 01 45 00 - Quality Control.

.6 Training: Refer to Section 01 79 00 – Equipment and Systems Demonstration and Training.

1.9 RECORD DOCUMENTS – ACTUAL SITE CONDITIONS

.1 Record information on a set of black line opaque drawings, provided by the Owner.

.2 Provide felt tip marking pens, maintaining separate colours for each major system, for recording information.

.3 Record information concurrently with construction progress. Do no conceal work until required information is recorded.

.4 Specifications: Legibly mark each item to record actual construction, including manufacturers, trade name, and catalogue number of each item actually installed, particularly optional items and substitute items.

.5 Other Documents: Maintain manufacturer’s certifications, inspection certifications, field test records, and warranties required by individual specification sections.

1.10 EQUIPMENT AND SYSTEMS

.1 Each Item of Equipment and Each System: include description of unit or system, and component parts. Give function, normal operation characteristics, and limiting conditions. Include performance curves, with engineering data and tests, and complete nomenclature and commercial number of replaceable parts.

.2 Panel board circuit directories: provide electrical service characteristics, controls, and communications.

.3 Include installed colour coded wiring diagrams.

.4 Operating Procedures: include start-up, break-in, and routine normal operating instructions and sequences. Include regulation, control, stopping, shut-down, and emergency instructions. Include summer, winter, and any special operating instructions.

.5 Maintenance Requirements: include routine procedures and guide for trouble-shooting; disassembly, repair, and reassembly instructions; and alignment, adjusting, balancing, and checking instructions.

.6 Provide servicing and lubrication schedule, and list of lubricants required.

.7 Include manufacturer's printed operation and maintenance instructions.

.8 Include sequence of operation by controls manufacturer.

.9 Provide original manufacturer's parts list, illustrations, assembly drawings, and diagrams required for maintenance.

.10 Provide installed control diagrams by controls manufacturer.

.11 Provide Contractor's coordination drawings, with installed colour coded piping diagrams.

.12 Provide charts of valve tag numbers, with location and function of each valve, keyed to flow and control diagrams.

.13 Provide list of original manufacturer's spare parts, current prices, and recommended quantities to be maintained in storage.

.14 Include test and balancing reports as specified.

.15 Additional requirements: As specified in individual specification sections.

1.11 SPARE PARTS AND MAINTENANCE MATERIALS

.1 Spare parts and maintenance materials provided shall be new, not damaged or defective, and of the same quality and manufacture as Products provided in the Work. If requested, furnish evidence as to type, source and quality of Products provided.

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

.3 Store spare parts and maintenance materials in a manner to prevent damage or deterioration.

.4 Provide spare parts, special tools, maintenance and extra materials in quantities specified in individual specification sections.

.5 Provide items of same manufacture and quality as items in the Work.

1.12 FINAL PAYMENT

.1 Following completion of lien period, submit claim for final lien payment in accordance with General Conditions.

.2 Submit certified copy of inspection list of items to be completed or corrected, endorsed and dated by Consultant. The certified copy of the list shall state that each item has been completed or otherwise resolved for acceptance.

.3 There will be no partial release of the deficiency holdback. Once all items on the deficiency list have been completed or corrected or otherwise resolved, submit claim for final deficiency holdback payment in accordance with the General Conditions.

END OF SECTION 01 77 00

1.1 DEFINITION

.1 An organized compilation of operating and maintenance data including detailed technical information, documents and records describing operation and maintenance of individual products or systems as specified in individual specification sections and drawings.

1.2 GENERAL

.1 Assemble, coordinate, bind and index required data into Operations and Maintenance Manual.

.2 Submit complete Operation and Maintenance Manual to the Project Manager one (1) weeks prior to application for Total Performance of the Contract.

.3 Submit four (4) copies in English.

.4 Submit one (1) copy in PDF format.

.5 Organize data into the same numerical order as contract specifications.

.6 Material: Label each section with tabs protected with celluloid covers fastened to hard paper dividing sheets.

.7 Type lists and notes.

.8 Drawings, diagrams and manufacturers literature must be legible.

1.3 BINDERS

.1 Binders: Vinyl, hard covered, 3 “D” ring, loose leaf, sized for 8 ½” x 11” paper, with spine pocket.

.2 Identify contents of each binder on the spine.

1.4 CONTENTS

.1 Binder 1:
- .1 Cover sheet containing:
  - .1 Date submitted
  - .2 Project title, location and project number
  - .3 Names and addresses of the Contractor, and all Subcontractors
- .2 Table of Contents of all binders
- .3 List of maintenance materials as specified
- .4 List of special tools as specified
- .5 List of spare parts as specified
- .6 Warranties, guarantees
- .7 Copies of approvals and certificates

.2 Remaining binders:
- .1 Cover sheet containing:
  - .1 Date submitted
  - .2 Project title, location and project number
- .2 Table of Contents of individual binder
- .3 Provide data as specified in individual sections of Divisions 02 to 16
  - .1 List of equipment including service depot
  - .2 Nameplate information including equipment number, make, size capacity, model number and serial number
  - .3 Parts list
  - .4 Installation details
  - .5 Operating instructions
  - .6 Maintenance instructions for equipment

.7 Maintenance instructions for finishes

.3 Shop drawings:

.1 Bind separately one complete set of reviewed final shop drawings and product data.

END OF SECTION 01 77 00

1.0 GENERAL

1.1 RELATED SECTIONS

.1 Summary of Work Section 01 10 00

.2 Contract Close-out Procedures Section 01 77 00

.3 Electrical and Mechanical drawings: Specific requirements from technical sections.

1.2 COORDINATION

.1 Coordinate content and presentations for demonstration workshops.

.2 Coordinate individual presentations and ensure representatives scheduled to present at seminars are in attendance.

.3 Coordinate instructors, including providing notification of dates, times, length of instruction, and course content.

.4 Coordinate proposed dates for seminars with Owner and select mutually agreeable dates.

1.3 PREPARATION OF AGENDAS AND OUTLINES

.1 Prepare agendas and outlines including the following:
- .1 Equipment and systems, which will be included in seminars.
- .2 Name of companies and representatives presenting at seminars.
- .3 Outline of each seminar's content.
- .4 Time and date allocated to each system and item of equipment.

1.4 PROGRAM STRUCTURE

.1 Develop an instruction program that includes individual training modules for each system and equipment not part of a system, as required by individual Specification Sections. For each training module, develop a learning objective and teaching outline. Include instruction for the following:
- .1 System design and operational philosophy, including the following:
  - .1 An overview of how system is intended to operate.
  - .2 Description of design parameters, constraints and operational requirements.
  - .3 Description of system operation strategies.
- .2 Review of documentation.
- .3 Operations.
- .4 Adjustments.
- .5 Troubleshooting.
- .6 Maintenance.
- .7 Repair.

.2 Present information dealing with equipment. Include following in presentations:
- .1 Explanation of how equipment operates.
- .2 Recommended preventative and routine maintenance.

1.5 DEMONSTRATION AND TRAINING

.1 Instruct Owner's personnel to adjust, operate, and maintain systems, subsystems, and equipment not part of a system:
- .1 Provide instructors experienced in operation and maintenance procedures.
- .2 Provide instruction at mutually agreed on times. For equipment that requires seasonal operation, provide similar instruction at the start of each season.
- .3 Schedule training with Owner, through Consultant, with at least seven (7) days' advance notice.

.4 Arrange for presentation leaders familiar with the design, operation, maintenance and troubleshooting of the equipment and systems. Where a single person is not familiar with aspects of the equipment or system, arrange for specialists familiar with each aspect.

.2 Demonstrate operation of equipment and systems. Include the following in demonstration:
- .1 Start up and shut down.
- .2 Operation.
- .3 Scheduled and preventative maintenance.
- .4 Troubleshooting.
- .5 Demonstration may be conducted at time of original starting with Owner's prior approval.

.3 Demonstration and training questions:
- .1 Be prepared to answer questions raised by Owner at demonstrations and seminars. If unable to satisfactorily answer questions immediately, provide written response within three (3) days.

.4 Conditions for Demonstrations
- .1 Equipment has been inspected and put into operation.
- .2 Testing, adjusting, and balancing has been performed and equipment and systems are fully operational.
- .3 Provide copies of completed operation and maintenance manuals for use in demonstrations and instructions.

END OF SECTION 01 79 00

1.0 GENERAL

1.1 DOCUMENTS

.1 This Section of the Specifications forms part of the Contract Documents and is to be read, interpreted and co-ordinated with all other parts.

1.2 SECTION INCLUDES

Generally, but not limited to the following:

.1 Demolish, remove existing millwork, lighting, walls (non-structural), doors, mechanical and electrical fixtures; flooring, ceiling, etc. as shown on drawing, or as required to complete the work.

.2 All material and debris resulting from demolition shall be promptly removed from Site and disposed of in a legal manner. Salvaged materials are to be reused or turned over to the Owner as indicated in drawings or other sections of the spec.

.3 Selling of any materials at the Site is not permitted; Contractor will be assumed to have allowed for any credit he may obtain from such materials.

.4 Make good damaged areas, which will not be concealed by new construction. Make good all structural damage. Match patching and making good work at least to that displayed by the existing; provide so new surfaces are plumb, level and properly aligned with existing.

1.3 RELATED SECTIONS

.1 Mechanical

.2 Electrical

1.4 REQUIREMENTS OF REGULATORY AGENCIES

.1 Comply with all bylaws and acquire all necessary permits.

.2 Comply with all Workers' Compensation Board of B.C. Accident Prevention Regulations.

1.5 PRODUCT DELIVERY, STORAGE AND HANDLING

.1 Store materials and equipment at Site only when immediately necessary, and as otherwise approved; and so as not to cause any obstruction.

1.6 SITE CONDITIONS

.1 The Contractor should accept the Site as it exists and will be responsible for all demolition work as shown on the Drawings or specified.

.2 The Contractor shall visit the Site at his own expense prior to the submission of Bids and take whatever time is required to ascertain the Site conditions and surrounding features related to the proposed demolition and new construction work, and ensure himself that conditions are suitable for the execution of the work.

.3 No additional sums of money will be allowed for any items resulting from lack of familiarity with the Site conditions; report any discrepancies to the Consultant.

.4 Use sufficient measures to protect existing services and existing space adjacent to the project area. Make good all damaged areas, which will not be covered up by new work.

.5 The Contractor will be held responsible for any such damage (movement or settlement) and must repair promptly such damage to the Owner's property at no additional cost to the Owner.

.6 Provide and maintain all legal and necessary hoarding, lights and warning signs during the execution of the work to fully protect all persons; provide adequate insurance in order that the Owner shall be saved harmless from any loss, damage, death or injury through neglect, carelessness, or incompetence of the Contractor, or the handling or condition of appliances.

.7 Maintain unobstructed safe access for personnel and removal of materials at all times.

.8 Take precautions to guard against movements, settlements, collapse and damages to adjacent structures, services, utilities and construction.

.9 Prevent debris from accumulating and blocking drainage systems and blocking safe exit passage to adjoining streets and property.

.10 Verify the existence of all known service utilities by Site examination and review of applicable engineering drawings available from the municipality, the Owner and the utility companies prior to submission of a bid and prior to the commencement of the work to identify exact locations.

.11 Keep fire extinguishing suppression equipment on hand at all times.

.12 Provide illumination for safe demolition and working conditions, but in no case less than prescribed by WSBC regulations in areas where work is being done.

1.7 SCHEDULING OF WORK

.1 Schedule the removal, capping and sealing of existing services first; then plan the demolition and removal of any other components.

.2 Sequence of Demolition is responsibility of the Contractor.

1.8 HAZARDOUS MATERIAL REMOVAL

.1 Refer to Hazardous Material report in Appendix 3 of the specification.

.2 Asbestos containing gypsum wall board ceiling around the perimeter of the building core will be removed by landlord.

2.0 PRODUCTS

2.1 MATERIALS

.1 All materials, or equipment not specifically described but required for the proper completion of the work of this Section, shall be selected by the Contractor subject to approval by the Owner.

.2 Except for materials and equipment to be removed and relocated and materials designated to be salvaged, the Owner does not require recovery of any existing materials, fittings, fixtures and equipment to be salvaged during the demolition operation. All materials forming part of this Section of the work shall become the Contractors property and shall be removed entirely from the Site and disposed of in a legal manner to an approved disposal waste-dumping Site as applicable.

.3 Selling or burning of salvaged materials, fittings, fixtures, and equipment on Site is not permitted.

3.0 EXECUTION

3.1 INSPECTION

.1 Inspect the work and notify the Owner of any conditions affecting the performance of the work. Review the drawings and determine the total content of work to follow.

.2 Ensure all services, whether built-in or exposed, are properly located and marked as to position, type of service, size, direction of flow.

.3 Inspect materials, equipment, components to be reused or turned over to the Owner. Note their condition and advise the Owner in writing of any defects or conditions which would affect removal and reuse.

.4 Site verify and locate all existing services, in basement ceiling. Provide x-ray scan re-bar prior to coring the concrete slab. Any damage to existing services will be the responsibility of the Contractor.

3.2 PREPARATION

.1 Cap off, disconnect and seal any required existing services, sanitary and storm sewers, waterlines, electrical and telephone services, gas service, in accordance with the contract documents as established by the appropriate consultant before starting with demolition.

.2 Take adequate measures during demolition to protect the public in conformance with CSA S350 and requirements of authorities having jurisdiction.

.3 Provide protection to ensure materials, finishes and surfaces to remain will not be damaged, scratched, or marred by work of this Section.

.4 Ensure that affected services and utilities designated for removal have been disconnected prior to the commencement of work.

3.3 WORKMANSHIP

.1 Do work in accordance with CSA S350 and Part 8.0 of VBBL 2014.

.2 Cutting, removing and demolition shall be performed so as not to cut or remove more that is necessary of to damage adjacent work. Cut existing construction back to meet straight lines allowing for replacement finishes of follow.

.3 Breakup large pieces of demolished material for handling and to prevent overloading and damage to existing construction.

.4 Schedule and execute all work in a careful manner with all necessary consideration to prevent injury or damages to persons and to surrounding property. Do not interfere with the passage to and from and operation of adjoining space.

.5 Do not let piled material endanger structure or persons at any time.

.6 Where any material, component, assembly or item is indicated for reuse, removal shall be by a trade, which normally provides or installs such an item.

.7 Store such items being reused in a protected area until ready to be reinstalled into the new construction proposed.

.8 Cut out and remove assemblies, materials, items indicated as being removed, abandoned or discarded on the drawings.

.9 Repair and make good damage to existing construction caused by the work of this Section. Use mechanics skilled in the type of work involved to replace such damaged work.

.10 Demolish in a manner as to minimize dusting. Keep dusty materials, areas contained within the project area.

.11 Clear and remove promptly by the end of each working day all demolished materials from the Site.

.12 Inspect existing conditions to confirm the extent and location of demolition will not damage adjacent areas.

.13 Should any conflicts arise, immediately contact the Consultant for direction prior to proceeding. At completion recover all materials. Leave Site neat and clean.

3.4 CLEAN-UP

.1 Continuously during the work of this Section remove all dirt, debris discarded material and deposit in waste containers. Keep routes to and from waste containers clear.

3.5 HAZARDOUS MATERIAL REMOVAL

.1 Fully comply with the recommendations and requirements as stipulated by the report as per Appendix 3 of the specification.

END OF SECTION 02 41 19

1.0 GENERAL

1.1 DOCUMENTS

.1 This Section of the Specifications forms part of the Contract Documents and is to be read, interpreted and co-ordinated with all other parts.

1.2 SECTION INCLUDES

.1 Rough carpentry for the work.

.2 Rough carpentry work not specified under another section but required for the work shall be provided under this section whether or not specifically referred to herein.

.3 Backboards for electrical, telephone/communication as applicable.

.4 Backing for millwork, door frames, and wall stop.

1.3 RELATED SECTIONS

.1	Finish Carpentry	Section 06 20 00
.2	Architectural Woodwork	Section 06 40 00
.3	Wood Doors	Section 08 14 00
.4	Finish Hardware	Section 08 71 00
.5	Supports for Plaster & Gypsum Board	Section 09 22 00
.6	Gypsum Board	Section 09 29 00

1.4 REFERENCE

.1 CSA B111-1974 Wire Nails, Spikes and Staples.

.2 CAN/CSA – G164-M92 Hop Dip galvanizing of irregularly shaped articles.

.3 CSA 0121-M78 Douglas Fir Plywood.

.4 CAN/CSA 0141-91 Softwood Lumber.

.5 CSA 0437 0-93, OSB Waterboard

.6 National Lumber Grades Authority (NLGA) Standard Grading Rules for Canadian Lumber.

1.5 SOURCE QUALITY CONTROL

.1 Lumber shall be grade marked by an agency certified by the Canadian Lumber Standards Accreditation Board.

.2 Plywood shall be grade marked in accordance with the requirements of applicable CSA standards.

.3 Wood Treatment: CAN/CSA-080.

1.6 WASTE MANAGEMENT & DISPOSAL

.1 Separate and recycle waste materials in accordance with Section 01 74 19.

.2 Separate wood waste in accordance with Waste Management Plan and place in designated areas.

.3 Set aside damaged wood for acceptable alternative uses (e.g. bracing, blocking, cripples, bridging, finger-joining, or ties). Store this separated reusable wood waste convenient to cutting station and area of work.

.4 Separate corrugated cardboard in accordance with Waste Management Plan and place in designated areas for recycling.

.5 Do not burn scrap at the project site.

.6 Fold up metal banding, flatten, and place in designated area for recycling.

2.0 PRODUCTS

2.1 MATERIALS

.1 Lumber

.1 Standards: unless specified otherwise, softwood, S4S material shall be used in accordance with the following standards:

Size, grading, inspection:	CSA 0141-1970
Species groups:	CSA 086-1976
Minimum grades:	National Lumber Grades Authority Standard Grading. Rules for Canadian Lumber NLGA 1987 edition.
Maximum moisture content:	12% interior.

.2 Furring, strapping, blocking: Douglas Fir, or Hemlock, Utility Grade.

.2 Plywood

.1 Standards: Douglas Fir Plywood: CSA 0121-M1978.

.2 Plywood in IT Cabinet 609 to be 19mm thick good one side plywood (G1S) fire retardant treated plywood installed on three sides of the room to 2440 mm high.

.3 Miscellaneous Materials

.1 Rough Hardware: Including machine bolts, washers, lag bolts, drift pins, dowels and such like, to CSA B33-1-1961; nails, spikes and staples to CSA B111-1974, galvanized in exterior locations, high humidity areas and elsewhere where liable to corrosion, and in treated lumber. Framing anchors by TECO, or other pre-approved as shown on structural drawings. Metal Fire stops: .455 mm (26 ga.) galvanized, as required by codes.

.4 Galvanizing: to CSA G164.

3.0 EXECUTION

3.1 INSTALLATION

.1 Install strapping, furring, blocking etc., where shown and elsewhere as required to space out and support other work.

.2 Locate, align and plumb faces of furring and blocking to accurate location of items supported to a tolerance of 1:600.

.3 Install wood cants, nailer curbs and other wood supports as required and secure using galvanized fasteners.

.4 Countersink hardware where necessary to provide clearance for other work.

.5 Co-ordinate with other trades and do all preparing, cutting, trimming as required for passage of their work. Attach plates, blocking, spacers, supports as required to receive and provide support for items supported.

.6 Provide 19mm thick plywood backboards for mounting electrical equipment.

.7 Provide blocking within wall assembly for all wall mount door stop.

3.2 CLEANING

.1 Remove all debris and excess material as work proceeds and at end of installation leaving area ready for other trades; repair any defects to this work or any other defects caused by this work.

END OF SECTION 06 10 00

1.0 GENERAL

1.1 DOCUMENTS

.1 This Section of the Specifications forms part of the Contract Documents and is to be read, interpreted and coordinated with all other parts.

1.2 RELATED SECTIONS

.1	Rough Carpentry	Section 06 10 00
.2	Architectural Woodwork	Section 06 40 00
.3	Hollow Metal Doors and Frames	Section 08 11 13
.4	Wood Doors	Section 08 14 00
.5	Finish Hardware	Section 08 71 00
.6	Gypsum Board	Section 09 29 00

1.3 SECTION INCLUDES

.1 Supply and installation of items of finish carpentry fabricated and installed on site as noted herein.

.2 Job-site assembly, installation, and fitting of shop-fabricated components specified under Section 06 40 00.

.3 Installation of doors and finish hardware.

1.4 REFERENCES

.1 Architectural Woodwork Standards as published by Architectural Woodwork Manufacturer's Association of Canada (AWMAC), latest edition.

1.5 QUALITY ASSURANCE

.1 If requested by the Consultant, install mock-up of millwork units for review.

.2 Ensure that components supplied to this section for installation are in accordance with reviewed shop drawings and that the components have been fabricated to suit the existing site conditions without modification.

.3 Items not given a specific quality grade shall be Custom grade as defined in the AWI/AWMAC QSI.

.4 The quality of workmanship and installation shall conform to or exceed the minimum requirements of Section 1700 of the AWMAC standard and as specified herein.

1.6 PRODUCT DELIVERY, STORAGE AND HANDLING

.1 Protect items from damage and moisture changes during delivery. Protect from damage by weather while in transit.

.2 Do not deliver and store items on site in advance of installation schedule. Deliver directly to room or area where items to be installed. Protect finished surfaces.

.3. Conform to Section 1700 of AWI/AWMAC QSI Manual.

1.7 JOB CONDITIONS

.1 Coordinate the work of this section with the work of others to ensure built-in items are incorporated. Provide all drawings and dimensions for the proper location of built-in anchorage and the provision of rough openings.

.2 Maintain at an ambient temperature between 16 degrees Celsius to 20 degrees Celsius and relative humidity of between 43% to 55% in the completed building, for 48 hours before installation and continuing up until final acceptance in rooms and areas in which work of this section is to be installed.

2.0 PRODUCTS

2.1 MATERIALS

.1 Supply miscellaneous hardware for installation of millwork items including nails, screws, bolts, nuts and washers.

.2 Supply and install blocking, backing and furring materials as required for installation.

.3 Douglas Fir Plywood: G.1.S (wood patches only permitted). G.2.S where exposed both sides.

3.0 EXECUTION

3.1 PREPARATION

.1 Obtain installation details for millwork from Section 06 40 00.

.2 Check hardware items delivered to ensure compliance with hardware schedule. Obtain installation instructions and templates.

.3 Cut to proper length and fit items supplied oversized.

.4 Provide anchors, nailers and blocking to secure millwork items.

3.2 DOOR FRAMES

.1 Install door frames in prepared openings square level, plumb and secure to wall framing with suitable sized fasteners concealed in final installation.

.2 Frames shall be glued and erected with concealed nails.

3.3 DOORS AND HARDWARE

.1 Install doors and hardware in accordance with the manufacturer's instructions and templates supplied under Section 08 71 00. Fit accurately using full complement of screws and draw up tight.

.2 Install hardware as indicated in Finish Hardware Section 08 71 00.

.3 Hang doors to open and close smoothly. Keep an even margin between door and jamb, sufficient on all sides to allow free action of the door. Readjust and check doors upon completion of the work, correct any restrictions to free action of the door caused by paint, moisture or improper fixing of hardware, etc.

.4 Ensure clearance on doors at head and jambs is not more than 3 mm, 12 mm at threshold, and 3 mm between meeting edges of pair doors. Bevel latch edge of doors allowing for swing clearance.

.5 Remove handling marks and drag marks by lightly sanding doors immediately after installation.

.6 Clean and polish hardware. Remove any scratched, marred or damaged hardware and replace with new.

.7 Upon completion of installation, have a representative of the hardware supplier review installation and confirm in writing to the Consultant that finish hardware has been installed correctly.

END OF SECTION 06 20 00

1.0 GENERAL

1.1 DOCUMENTS

.1 This Section of the Specifications forms part of the Contract Documents and is to be read, interpreted and coordinated with all other parts.

1.2 SECTION INCLUDES

.1 Architectural millwork including counters and cabinets as shown on drawings.

1.3 RELATED SECTIONS

.1	Rough Carpentry	Section 06 10 00
.2	Finish Carpentry	Section 06 20 00
.3	Sealants and Caulking	Section 07 92 00
.4	Painting	Section 09 91 00

1.4 SUBMITTALS

.1 Submit shop drawings and samples in accordance with Section 01 33 00 Submittals.

.2 Furnish shop drawings for review. Confirm all dimensions at site prior to fabrication. Detail all architectural woodwork construction at large scale not less than one-quarter (1/4) full size.

.3 Shop drawings shall have been reviewed by AWMAC and carry AWMAC Inspector's review stamp of acceptance, as a condition of Guarantee Certificate, prior to submittal to Consultant.

.4 Shop drawings shall show construction details of architectural woodwork, general arrangements, locations of all service outlets; typical and special installation conditions; the material being supplied and connections, attachments, anchorage and location of exposed fastenings, as applicable.

.5 Shop drawings shall incorporate plans, elevations, sections and details for all work included in this section. Details shall show and specify all thicknesses, types, finishes, profiles, joints and hardware.

.6 Submit duplicate samples of plastic laminate.

.7 Architectural woodwork is subject to inspection and approval by the Consultant prior to installation.

.8 Submit manufacturer's descriptive literature of specialty items not manufactured by the Architectural Woodwork Manufacturers.

.9 Provide maintenance data for all finishes and hardware, for incorporation into maintenance manual.

1.5 QUALITY ASSURANCE

.1 Refer to the Architectural Woodwork Standards (AWS) as published by Architectural Woodwork Manufacturer's Association of Canada (AWI/AWMAC), Latest Edition.

.2 Any reference to "Custom" or "Premium" grade in this specification shall be as defined in the Standards.

.3 All millwork shall be Custom grade as defined in the standards.

.4 If requested by the Consultant, provide a unit of architectural woodwork to the site during shop drawing review stage.

.5 Unit to be as selected by the Consultant and is to be of the actual construction, materials, and finishes specified.

.6 If approved, unit may be installed as part of the contract.

.7 Single-Source Responsibility for Fabrication and Installation. Engage a qualified woodworking firm to assume undivided responsibility for fabricating, finishing and installing woodwork specified in this section.

1.6 PRODUCT DELIVERY, STORAGE AND HANDLING

.1 Do not deliver architectural woodwork until building is in proper condition and suitable arrangements have been made to properly handle, prime, store and protect this work.

.2 Assemble architectural woodwork at mill; cover with protective weatherproof wrapping and deliver in sections to clear all access openings. Protect from damage during transport and handling.

.3 In accordance with AWMAC Quality Standards.

1.7 JOB CONDITIONS

.1 Coordinate the work of this section with the work of others to ensure provisions for items to be incorporated in architectural woodwork items.

.2 Do not deliver architectural woodwork until rooms and areas in which work of this section to be installed are maintained at an ambient temperature between 16 degrees Celsius to 21 degrees Celsius, and a relative humidity of between 43% to 55% in the building, for 48 hours before installation and continuously up until final acceptance.

1.8 WASTE MANAGEMENT AND DISPOSAL

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

.2 Separate wood waste in accordance with Waste Management Plan and place in designated areas.

.3 Set aside damaged wood for acceptable alternative uses (e.g. bracing, blocking, cripples, bridging, finger-joining, or ties). Store this separated reusable wood waste convenient to cutting station and area of work.

.4 Separate corrugated cardboard in accordance with Waste Management Plan and place in designated areas for recycling.

.5 Do not burn scrap at the project site.

.6 Fold up metal banding, flatten, and place in designated area for recycling.

1.9 GUARANTEE

.1 The architectural woodworker shall furnish the owner with a two (2) year AWMAC Guarantee or a two (2) year maintenance bond to the full value of the architectural woodwork sub-contract, certifying that the architectural woodwork has been manufactured and/or installed in accordance with the standards incorporated in the AWS Manual, (edition in effect at time of tender).

2.0 PRODUCTS

2.1 GENERAL

.1 Clean, new stock to comply with AWMAC grade required using material as specified.

.2 Seal exposed and concealed surfaces of wood products containing formaldehyde to prevent off – gassing.

2.2 PLASTIC LAMINATE

1. Standard: CAN3-A172.M79 or NEMA Class 1.

2. Grade: Standard duty.

3. Acceptable Manufacturers: Nevamar, Wilsonart, Pionite, Formica, Octolam, Arborite.

4. Exposed vertical surfaces: fronts of doors, drawers and outside of gables, 0.76 mm nominal thickness.

5. Cabinet interiors: 0.50 mm Cabinet Liner Grade – shelves, interior of gables and backs, colour white; same colour as face laminates for back of laminated cabinet doors, drawers.

6. Cabinet tops and rigid plastic bases, countertops, backsplashes: 1.27 mm nominal thickness.

7. Plastic Laminate Schedule:
   - .1 PL-1 Nevamar Macchiato WF0011T Textured (Vertical Grain Installation)
   - .2 PL-2 Not use
   - .3 PL-3 Wilsonart Orange Grove D501-60
   - .4 Location: PL-1 for all cabinets U.O.N., PL-3 for Workout Room south wall wall panel front (refer to drawings).

8. Melamine:
   - .1 Panolam, S645 True White, Chamois Texture

2.3 CASEWORK

.1 Conform to AWI/AWMAC AWS Manual as applicable.

.2 Casework with Plastic Laminate Finish:
   - .1 AWMAC Quality Grade: Custom. Locations as noted on the drawings.
   - .2 Construction: Conform to Section 400 of the manual for Flush Overlay Casework. Close voids and cavities at inside corners and behind end fillers of upper cabinets.
   - .3 General: All cabinets to be made from 19mm plywood with hardwood edges complete with 13mm plywood backing.
   - .4 Exposed Parts: Plastic laminate on Medite 2 core, U.N.O.
   - .5 Semi-Exposed Parts: Plastic laminate on Medite 2 core. Color, pattern and finish to match exposed parts, U.N.O.
   - .6 Exposed Shelving, U.N.O: Medite 2 core in plastic laminate with plam edges.
   - .7 Interior Shelving, U.N.O: 19 mm (or 25 mm for longer span as per AWMAC requirement) melamine with finished edges. All interior gables and interior backing to be melamine on closed units. All doors, drawers would be plastic laminate on both sides; on open units all interior to be plastic laminate.
   - .8 Edge Banding, U.N.O: matching laminate face material finish in colour, pattern, and finish as per AWMAC Standard.
   - .9 Concealed Parts: backer to manufacturer's option.

2.4 CASEWORK HARDWARE

.1 Hinges: fully concealed, all metal construction, 3-way adjustment, one (1) hinge in each pair to be spring activated, 170 degree opening. Acceptable Product: Modul 170º by Blum Furniture Fittings.

.2 Door and Drawer Recessed Pulls: Matt Chrome Finish, 160mm c/c, 166 x 40x 14mm. Acceptable Product: Richelieu 616748160-174 or equivalent.

.3 Drawer Slides: Full extension with 25mm over travel, side mounting, telescopic action on ball bearings, 100 lb. class, chrome finish, lift or lever disconnect for drawer removal, non-handed. Acceptable products: Accuride, Knape & Vogt, Roll-it or equivalent.

.4 Adjustable Shelf Standards and Supports: Adjustable Aluminum Shelf Standards and Supports, 17-gauge aluminum, 13mm on centers adjustment increments. Electro-plated aluminum finish. Recess standards in gables. Acceptable Product: Richelieu Knape & Vogt #255 standards and #256 supports or equivalent.

.5 Garbage/Recycling Waste Bin:
LLDPE (Linear Low Desnity Polyethylene) Recycling Container, total capacity: 15 7/8 gallon; product dimensions to be 280mm W x 590mm L x 632mm H; Color to be blue. Acceptable product: Rubbermaid Slim Jim Recycling Container with Handles **#3541-73** or equivalent.

.6 Finish to all cabinet hardware – Satin chrome finish unless otherwise specified.

.7 Provide colour-coordinated plastic screw caps on ctsk screws.

.8 All millwork hardware as required to complete work.

2.5 COUNTERTOPS FOR CASEWORK AND BACK/SIDE SPLASHES:

.1 Solid Surface on core materials.

.2 Core Materials: 19mm minimum non-telegraphing plywood at countertops with sink or other plumbing cut-outs. 25mm thick for longer span as per AWMAC requirement.

.3 Refer drawings for location and size of backsplash and side splashes.

.4 Caulking at all edges.

2.6 SOLID SURFACE (SS)

.1 Material: Solid polymer components
  .1 Cast, nonporous, filled polymer, not coated, laminated or of composite construction with through body colors meeting ANSI Z124.3 or ANSI Z124.6, having minimum physical and performance properties specified.
  .2 Superficial damage to a depth of 0.25 mm shall be repairable by sanding and/or polishing.

.2 Thickness: 13 mm UNO.

.3 Edge treatment: Top ¼" Roundover, U.N.O.

.4 Sheet Size: Maximum size with minimal joint required for each application.

.5 Acceptable manufacturer, product and color: Corian Sparkling White.

.6 Accessories:
.1 Silicone Sealant: Mildew-resistant, FDA-compliant sealant recommended by manufacturer, in colour to match solid surface.
.2 All other accessories as recommended by solid surface manufacturer.
.3 Ultra-Bond G Adhesive: Pre-measured and pre-tinted two-part adhesive colored to match surfacing.

2.7 FABRICATION

1. Comply with the AWI/AWMAC AWS.

2. All marked at mill and end marked; delivered to site with certificates as to species, grades, seasoning, moisture content and other evidence as required by the Consultant to show compliance with specifications.

3. Sandpaper all finish wood surfaces thoroughly as required to produce a uniformly smooth surface. Always sand in the direction of the grain. No coarse-grained sandpaper marks, hammer marks or imperfections will be accepted.

4. Provide and install all necessary hot-dip galvanized nails, screws and other fasteners to suite components being joined or secured.

5. Shop-install cabinet hardware for doors, shelves and drawers. Use friction catches to provide some seismic restraint.

6. Provide cut-outs for plumbing fixtures, inserts, appliances, outlet boxes and other fixtures.

7. Shop-assemble work for deliver to site in sizes easily handled and to ensure passage through building openings.

8. Shop-finish cabinet work ready for installation. Limit on-site finishing to touch-up and to site-fabricated/fitted items where shop-finishing is impractical.

9. Cut and finish component edges with clean, sharp returns, U.N.O. Finished edges shall have a 1.6 mm radius.

10. Cutouts for accessories shall be smooth and uniform without saw marks. The top and bottom of openings shall be finished smooth.

11. Obtain governing dimensions before fabricating items which are to accommodate or abut appliances, equipment and other materials.

12. Provide sufficient clearance between backsplash and faucet for operation of lever handle.

13. Ensure adjacent parts of continuous laminate work match in colour and pattern.

14. Veneer laminated plastic to core material in accordance with adhesive manufacturer's instructions. Ensure core and laminate profiles coincide to provide continuous support and bond over entire surface. Use continuous lengths up to 3050mm. Keep joints 600 mm from sink cutouts.

.15 For solid surface, shop assembly:

.1 Fabricate components to greatest extent practical to sizes and shapes indicated, in accordance with approved shop drawings and manufacturer's printed instructions and technical bulletins.

.2 Form joints between components using manufacturer's standard joint adhesive without conspicuous joints.

.3 Rout and finish component edges with clean, sharp returns and smooth edges.

3.0 EXECUTION

3.1 EXAMINATION

.1 Inspect site conditions where millwork is to be installed. Report any defects in the work of other Sections that may affect the installation of millwork to the Consultant.

3.2 PREPARATION

1. Condition woodwork to average prevailing humidity conditions in installation areas before installing.

2. Before installing architectural woodwork, examine shop-fabricated work for completion and complete work as required, including back priming and removal of packing.

3.3. INSTALLATION

.1 Quality Standard: Install woodwork to comply with AWI/AWMAC AWS Manual for type of woodwork involved.

.2 Install woodwork plumb, level, true, and straight with no distortions. Shim as required with concealed shims. Install to a tolerance of 1/8 inch in 96 inches (3mm in 2400mm) for plumb and level (including tops).

.3 Fasten and anchor millwork securely. Provide heavy duty fixture attachments for wall mounted cabinets. Anchor free standing units to floor.

.4 Anchor woodwork to anchors or blocking built in or directly attached to substrates. Secure to grounds, stripping and blocking with countersunk, concealed fasteners and blind nailing as required for complete installation. Use fine finishing nails for exposed nailing, countersunk and filled flush with woodwork and matching final finish where transparent finish is indicated.

.5 Cabinets: Install without distortion so that doors and drawers fit openings properly and are accurately aligned. Adjust hardware to centre doors and drawers in openings and to provide unencumbered operation. Complete the installation of hardware and accessory items as indicated.

.6 Tops: Anchor securely to base units and other support systems as indicated. Caulk space between back-splash and wall with specified sealant.

.7 Install countertops with no more than 1/8 inch in 96-inch (3mm in 2400mm) sag, bow, or other variation from a straight line. Use draw bolts in countertop joints.

.8 Secure back and side-splashes to tops with concealed metal brackets at 16 inches (400 mm) O.C.

.9 Scribe and cut as required to fit abutting walls and to fit properly into recesses and to accommodate piping, columns, fixtures, outlets or other projecting, intersecting or penetrating objects.

.10 Fit hardware accurately and securely in accordance with manufacturer's written instructions.

.11 For solid surface:

.1 Provide product in the largest pieces available.

.2 Form field joints using manufacturer's recommended adhesive, with joints inconspicuous in finished work. Exposed joints/seams shall not be allowed.

.3 Reinforce field joints with solid surface strips extending a minimum of 25mm on either side of the seam with the strip being the same thickness as the top.

.4 Cut and finish component edges with clean, sharp returns.

.5 Anchor securely to base cabinets or other supports.

.6 Align adjacent countertops and form seams to comply with manufacturer's written recommendations using adhesive in color to match countertop.

.7 Carefully dress joints smooth, remove surface scratches and clean entire surface.

.8 Attach solid surfaces material to leveled supports on frame with dabs of silicone every 460 to 610mm.

3.4 ADJUSTING AND CLEANING

.1 As installation progresses and upon completion clean up debris, packaging and left over materials.

.2 Repair damaged and defective woodwork where possible to eliminate functional and visual defects; where not possible to repair, replace woodwork. Adjust joinery for uniform appearance.

.3 Clean millwork and cabinet work, inside cupboards and drawers and outside surfaces.

.4 Clean, lubricate, and adjust hardware.

.5 Touch up shop-applied finishes to restore damaged or soiled areas.

3.5 PROTECTIONS

.1 Provide appropriate protection to millwork until building is accepted for use by owner.

.2 In the event of damage, all repairs and replacements necessary shall be made immediately to the approval of the Consultant at no extra cost.

.3 Provide final protection and maintain conditions in a manner acceptable to fabricator and Installer that ensures that woodwork is without damage or deterioration at the time of Substantial Performance.

END OF SECTION 06 40 00

1.0 GENERAL

1.1 DOCUMENTS

.1 This Section of the Specifications forms part of the Contract Documents and is to be read, interpreted and coordinated with all other parts.

1.2 SECTION INCLUDES

.1 Acoustic insulation as indicated on the drawings and specified herein.

1.3 RELATED SECTIONS

.1	Rough Carpentry	Section 06 10 00
.2	Finish Carpentry	Section 06 20 00
.3	Supports for Plaster & Gypsum Board	Section 09 22 00
.4	Gypsum Board	Section 09 29 00

1.4 PRODUCT DELIVERY, STORAGE & HANDLING

.1 Materials shall be stored in a dry and protected area, off the ground, in original undamaged, sealed container with manufacturer's labels and seals in tact. Avoid freezing.

1.5 PROJECT CONDITIONS

.1 Review manufacturer's recommendations for ambient temperatures during and after application.

.2 Report to general contractor in writing, defects of work prepared by other trades and unsatisfactory site or environmental conditions.

.3 Examine surfaces to ensure they are dry, clean, free of oil, grease, dirt, paint, mull scale or other deleterious material that would impair bonding.

.4 Commencement of work shall imply acceptance of surfaces and conditions.

2.0 PRODUCTS

.1 Acoustic and Fire Rated Wall Assembly Batt: Mineral Wool Insulation. Acceptable product: Roxul AFB (Acoustical Fire Batt).

3.0 EXECUTION

3.1 INSPECTION

.1 Ensure that surfaces to receive insulation are clean and free of obstructions.

.2 Do not install insulation in framing until roofing is complete and the building is enclosed.

3.2 WORKMANSHIP

.1 Install insulation to maintain continuity of thermal protection to building elements and spaces.

.2 Install batt and rigid insulation to all other areas indicated on drawings to thickness shown.

.3 Fit closely around electrical boxes, pipes, ducts, frames, joists, and other objects in or passing through insulation.

3.3 INSTALLATION

.1 Batt insulation installation

.1 Install batt insulation for acoustic separations so as to press on drywall over entire surface area.

.2 Cut and trim insulation neatly, to fit spaces. Use batts free of ripped backs and/or edges. Butt edges and ends tightly.

3.4 ADJUSTING AND CLEANING

.1 Remove waste and excess material off site at completion of application. Repair and make good any defects to this application or any defects caused by this application.

END OF SECTION 07 21 00

1.0 GENERAL

1.1 DOCUMENTS

.1 This Section of the Specifications forms part of the Contract Documents and is to be read, interpreted and coordinated with all other parts.

1.2 SECTION INCLUDES

.1 Provide all labour, material, services and equipment necessary for supply and installation of firestopping and smoke seals as indicated on drawing or specified herein.

.2 Firestopping materials and/or systems intended to act as a firestop and smoke seal within fire resistive wall for any through penetrating items, poke through termination devices and electrical outlet boxes.

.3 Seals forming draft tight barriers to retard the passage of smoke, flame and hose stream. Sealants for uses with the fire-resistance-rated construction joints, and at the top of gypsum wall assembly where it meets a metal or concrete deck

1.3 RELATED SECTIONS

.1	Rough Carpentry	Section 06 10 00
.2	Supports for Plaster and Gypsum Board	Section 09 22 00
.3	Gypsum Board	Section 09 29 00

1.4 REFERENCES

.1 Test Requirements: ULC-S115-11, “Standard Method of Fire Tests of Firestop Systems.

.2 Underwriters Laboratories of Canada (ULC) of Scarborough runs CAN4-S115-M under their designation of ULC-S115-11 and publishes the results in their “Fire Resistance Ratings Directory” that is updated annually.

Underwriters Laboratories (UL) of Northbrook, IL runs ASTM E-814 under their designation of UL 1479 and publishes the results in their “Fire Resistance Directory” that is updated annually. UL tests that meet the requirements of ULC-S115-11 are given a cUL listing and are published by UL in their “Products Certified for Canada (cUL) Directory.”

.3 Test Requirements: UL 2079, “Tests for Resistance of Building Joint Systems” (July 1998.) This test requirement provides more guidelines for testing moving joints than that given in CAN4-S115-M. UL tests that meet the requirements of ULC-S115-11 are given a cUL listing and are published by UL in their “Products Certified for Canada (cUL) Directory.

.4 International Firestop Council Guidelines for Evaluating Firestop Systems Engineering Judgements.

.5 CAN/ULC-S102-10, Standard Test Method for Surface Burning Characteristics of Building Materials.

.6 Vancouver Building Bylaw 2014.

.7 NFPA 101 – Life Safety Code.

.8 Canadian Electrical Code.

1.5 SUBMITTALS

.1 Submit shop drawings and product data in accordance with Section 01 33 00.

.2 Shop Drawings:

.1 Submit shop drawings to show proposed material, reinforcement, anchorage, fastenings and method of installation. Construction details should accurately reflect actual job conditions.

.2 Submit manufacturer's specifications and installation instructions for each type of material required. Include data substantiating that the materials comply with specified requirements. Include composition and limitations, documentation of ULC or cUL firestop systems.

.3 Samples:

.1 Submit samples in accordance with Section 01300.

.2 Submit duplicate 300 mm x 300 mm samples showing actual firestop material proposed for the project.

1.6 QUALITY CONTROL

.1 Manufacturer: Company specializing in manufacturing products of this section with a minimum of three (3) years proven experience.

.2 Applicator: Approved, licensed and supervised by the manufacturer of Firestopping Materials with a minimum of three (3) years proven experience.

.3 Product: Manufactured under a Underwriter's follow-up program and bearing listing label.

.4 Pre-Installation Conference: Convene a meeting between related sections following award of contract to discuss Firestopping requirements. Ensure that other sections are aware of the maximum and minimum clearance requirements to the penetration stipulated by the Underwriter's design listing.

1.7 PRODUCT DELIVERY, STORAGE AND HANDLING

.1 Deliver materials undamaged in manufacturer's clearly labeled, unopened containers, identified with brand, type, and ULC or cUL label where applicable.

.2 Coordinate delivery of materials with scheduled installation date to allow minimum storage time at job-site.

.3 Store materials under cover and protect from weather and damage in compliance with manufacturer's requirements.

.4 Comply with recommended procedures, precautions or remedies described in material safety data sheets as applicable.

.5 Do not use damaged or expired materials.

1.8 PROJECT CONDITIONS

.1 Do not use materials that contain flammable solvents.

.2 Schedule installation of firestopping after completion of penetrating item installation but prior to covering or concealing of openings.

.3 Verify existing conditions and substrates before starting work. Correct unsatisfactory conditions before proceeding.

.4 Weather conditions: Do not proceed with installation of firestop materials when temperatures exceed the manufacturer's recommended limitations for installation printed on product label and product data sheet.

.5 During installation, provide masking and drop cloths to prevent firestopping materials from dropping.

2.0 PRODUCTS

2.1 MATERIALS

.1 Firestopping, general

.1 Provide firestopping composed of components that are compatible with each other, the substrates forming openings, and the items, if any, penetrating the firestopping under conditions of service and application, as demonstrated by the firestopping manufacturer based on testing and field experience.

.2 Provide components for each firestopping system that are needed to install fill material. Use only components specified by the firestopping manufacturer and approved by the qualified testing agency for the designated fire-resistance-rated systems.

.3 Firestopping Materials are either "cast-in-place" (integral with concrete placement) or "post installed." Provide cast-in-place firestop devices prior to concrete placement.

.2 Fire stopping and smoke seal systems:

.1 Asbestos-free materials and systems capable of maintaining an effective barrier against flame, smoke and gases in compliance with requirements of CAN4-S115 and not to exceed opening sizes for which they are intended.

.2 Firestop system rating: As indicated on drawings.

.3 Service Penetration Assemblies: Certified by ULC in accordance with CAN4-S115 and listed in ULC Guide No. 40 U19.

.4 Service Penetration Firestop Components: Certified by ULC in accordance with CAN4-S115 and listed in ULC Guide No. 40 U19.13 and ULC Guide No. 40 U19.15 under the Label Service of ULC.

.5 Fire-resistance rating of installed firestopping assembly not less than the fire-resistance rating of surrounding floor and wall assembly.

.6 Firestopping and smoke seals at openings intended for ease of re-entry such as cables: Elastomeric seals; do not use cementitious or rigid seal at such locations.

.7 Firestopping and smoke seals at openings around penetrations for pipes, ductwork and other mechanical items, provide non-shrink grout in gaps and install retaining angle in accordance with SMACNA

.8 Primers: To the manufacturer's recommendation for specific material, substrate and end use.

.9 Water (if applicable): Potable, clean and free from injurious amounts of deleterious substances.

.10 Damming and Backup Materials, Supports and Anchoring Devices: To the manufacturer's recommendations, and in accordance with tested assembly being installed as acceptable to authorities having jurisdiction.

3.0 EXECUTION

3.1 PREPARATION

.1 Examine sizes and conditions of voids to be filled to establish correct thicknesses and installation of materials. Ensure that substrates and surfaces are clean, dry and frost free.

.2 Prepare surfaces in contact with firestopping materials and smoke seals to the manufacturer's instructions.

.3 Maintain insulation around pipes and ducts penetrating fire separation.

.4 Mask where necessary to avoid spillage and overcoating onto adjoining surfaces; remove stains on adjacent surfaces.

3.2 INSTALLATION

.1 Install firestopping and smoke seal material and components in accordance with listed cUL/ULC/WHI assembly.

.2 Seal holes or voids made through penetrations, poke-through termination devices, and unpenetrated openings or joints to ensure continuity and integrity of fire separation are maintained.

.3 Provide temporary forming as required and remove forming only after materials have gained sufficient strength and after initial curing.

.4 Tool or trowel exposed surfaces to a neat finish.

3.3 FIELD QUALITY CONTROL

1. Notify the Consultant when ready for inspection and prior to concealing or enclosing Firestopping Materials and service penetration assemblies.

2. Tag service penetrations and every 3.0 meters of joint seal with printed tags indicating name and phone number of subcontractor and the following statement: “CAUTION! FIRESTOP: DO NOT RE-ENTER, PUNCTURE OR DESTORY UNLESS PREPARED TO RE-SEAL IMMEDIATELY WITH PROPER, APPROVED METHOD!”

3. Allow for six (6) firestops to be disassembled in the presence of the Consultant. Should any of these firestops prove inadequate, the Consultant will order the inspection of additional firestops. Following inspections, reinstate the firestops.

3.4 INSPECTION

.1 Notify the Consultant when ready for inspection and prior to concealing or enclosing firestopping materials and service penetration assemblies.

3.5 SCHEDULE

.1 Firestop and smoke seal at:
- .1 Penetrations through fire-resistance rated gypsum board partitions and walls around electrical room and mechanical room.
- .2 Intersection of floor slab and fire-resistance rated gypsum board partitions.
- .3 Around mechanical and electrical assemblies penetrating fire separations.
- .4 Rigid Ducts: Provide non-shrink grout in gaps and install retaining angle in accordance with SMACNA.

3.6 ADJUSTING AND CLEANING

.1 Remove excess materials and debris and clean adjacent surfaces immediately after application.

.2 Remove temporary dams after initial set of firestopping and smoke seal materials.

END OF SECTION 07 80 00

1.0 GENERAL

1.1 DOCUMENTS

.1 This Section of the Specifications forms part of the Contract Documents and is to be read, interpreted and co-ordinated with all other parts.

1.2 SECTION INCLUDES

.1 Exterior and interior sealants, joint back-up and joint preparation.

1.3 RELATED SECTIONS

.1	Finish Carpentry	Section 06 20 00
.2	Wood Doors	Section 08 14 00
.3	Glazing	Section 08 80 00
.4	Gypsum Board	Section 09 29 00
.5	Painting	Section 09 91 00

1.4 SUBMITTALS

.1 Submit samples of each type of material and colour at job site during application.

.2 Cure samples under conditions anticipated at job site during application.

1.5 PRODUCT DELIVERY, STORAGE AND HANDLING

.1 Deliver materials to the job site in their original unopened containers with all labels intact.

.2 Cure samples under conditions anticipated at job site during application.

1.6 ENVIRONMENTAL REQUIREMENTS

.1 Apply sealants only to completely dry surfaces and at air temperatures above minimum established by manufacturer's specifications.

1.7 WARRANTY

.1 Provide a written warranty stating that caulking work of this Section is guaranteed against leakage, cracking, crumbling, melting, shrinkage, running, loss of adhesion and/or staining adjacent surfaces for a period of three (3) years from the date of Certificate of Substantial Performance.

2.0 PRODUCTS

2.1 MATERIALS

.1 Primers: Type recommended by sealant manufacturer.

.2 Sealants acceptable for use on this project must be listed on the Qualified Products List issued by the CGSB Qualification Board for Joint Sealants.

.3 Joint Fillers:

- .1 General: Compatible with primers and sealant, outsized 30 to 50%.
- .2 Either polyethylene, extruded closed cell foam or foam butyl rods: Sofrod by Tremco or Ethafoam SB by Dow Chemical. Backer Rod by Sternson Limited.
- .3 Polyolefin Foam: Sof - Rod by Tremco Ltd. or open cell polyurethane Ohio by Tremco Ltd. Approved alternative is PRC Open Cell Polyurethane Backer Rod.

.4 Bond Breaker: Pressure sensitive plastic tape, which will not bond to sealants for specific sealant selected.

.5 Colours: Selected by Consultant

.6 Joint Cleaner: Non-corrosive type recommended by sealant manufacturer and compatible with joint forming materials.

.7 Sealant:

.1 Standard: For interior work unless otherwise specified, ensure compatibility of sealants being used and other materials in contact with them, and conform to the latest editions of the specifications summarized below:

.2 Sealant Types:

Type 1: Acrylic sealant: for exposed interior GWB partition joints between GWB and masonry or concrete, interior windows and door frames; conform to CGSB 19-GP-5M Standard; MONO 555 by Tremco (Canada) Ltd., ACRYFLEX by Sternson Limited or approved alternative.

Type 2: Silicone caulking: plumbing fixtures, ceramic tile; white, mildew resistant; GE-SCS 1700 Sanitary Sealant, TREMCO PROGLAZE white, DOW CORNING 786, or approved alternative.

Type 3: Partition sealant: For sealing partitions acoustically; TREMCO Acoustical Sealant, Sternson's ACRYFLEX, or approved alternative, for concealed sealing; TREMCO 555, acrylic sealant conforming to CGSB 19-GP-5M standard, for exposed to view sealing work; provide around electrical boxes, phone plugs, and other penetrations in partitions scheduled for acoustic separation.

Type 4: Silicone sealant: (For glass to glass interior butt joints) General Electric (SCS-1203-black) (SCS-1201-clear) one part silicone rubber, conforming to CGSB CAN 2-19.13-M87, Class 25 Standard; (TREMCO PROGLAZE SSG).

3.0 EXECUTION

3.1 CONDITIONS OF SURFACES

.1 Verify at the site that joints and surfaces have been provided as specified under the work of other sections; and that joint conditions will not adversely affect execution, performance or quality of completed work; and that they can be put into acceptable condition by means of preparation specified in this section.

.2 Ascertain that sealers and coatings applied to substrates are compatible with sealant used and the full bond between sealant and substrate is attained. Request samples of the sealed or coated substrate from their fabricators for testing of compatibility and bond if necessary.

.3 Verify that specified environmental conditions are ensured before commencing work.

.4 Ensure that releasing agents, coatings, or other treatments have either not been applied to joint surfaces or that they are entirely removed.

.5 Defective work resulting from application to unsatisfactory joint conditions will be considered the responsibility of the sub-contractor performing the Work of this section.

3.2 PREPARATION

.1 Remove dust, paint, rust, oil, grease, frost and other foreign matter. Dry joint surfaces. Use joint cleaner where appropriate.

.2 Remove dust, silt, mill scale, and coatings from ferrous metals by wire brush, grinding or sandblasting.

.3 Install joint filler or apply bond breaker tape to achieve correct joint depth.

.4 Prepare concrete, masonry glazed and vitreous surfaces to sealant manufacturer's instructions.

.5 Examine joint sizes and correct to achieve depth ratio $^1/_2$ of joint width with minimum width and depth of 6 mm., maximum width 25 mm. Where joint configuration does not allow for proper depth/width ratio, a pressure sensitive bond breaker tape shall be placed at the back of the joint which will not bond to the sealant.

.6 Clean ferrous metal joint bonding surfaces to bare non-oxidized metal and remove oil, grease and other contaminants with Xylol, methylethylketone or isopropylalcohol.

.7 Where required, prime sides of joint in accordance with manufacturer's direction immediately prior to caulking.

.8 Where necessary to prevent staining, mask adjacent surfaces prior to priming and caulking.

.9 Apply bond breaker tape where required to manufacturer's instructions.

3.3 INSTALLATION

.1 The Consultant, the Contractor, the caulking contractor and the sealant manufacturer representative shall, at the Contractor's written notice, meet at the project site to review the material selection, joint preparations, installation procedures and co-ordination with other trades. If required, the Contractor shall perform sample installation on site in the presence of the above mentioned persons indicative of the types of joints detailed. These panels will form the basis of acceptable workmanship and refinement of installation details.

3.4 APPLICATION

.1 Apply sealants, primers, joint fillers to manufacturer's instructions. Apply sealant using a gun with proper size nozzle. Use sufficient pressure to fill voids and joints solid. Superficial pointing with skin bead is not acceptable.

.2 Form surface sealant with full bead, smooth, free from ridges, wrinkles, sags, air pockets, and embedded impurities. Neatly tool to a slight concave joint.

.3 Acoustic sealant:

.1 Apply to junction walls designated as acoustical on each side and at electrical or mechanical openings or penetrations through wallboard in such walls and at edges of acoustic ceilings. Apply sealant at tops of partitions after final ceiling tile adjustments are complete.

.2 Seal joint between edge of wallboard, both layers on two layer application, and adjoining surfaces on both sides of sound rated partitions, prior to taping and filling, with bead of sealant, two beads at two layer application.

.3 Extrude a full 9.5 mm. diameter bead, two beads at two layer application, into each joint to effectively block airborne sound transmission.

.4 Apply acoustic sealant to junctions of metal fire stops.

.4 Apply sealant to joints between window or door frames to adjacent building components, around perimeter of every external opening, to control joints in masonry walls concrete slabs and where indicated.

3.5 ADJUSTING AND CLEANING

.1 Clean adjacent surfaces immediately and leave work clean and neat. Remove excess sealant and droppings using recommended cleaners as work progresses. Remove masking after tooling of joints.

END OF SECTION 07 92 00

DOOR SCHEDULE

DOOR							FRAME				RATING (HR)	ROOM	Remark
	Door Clear Opening												
No.	W (mm)	H (mm)	Type	Mat'l	Finish	Glass Type	Type	Mat'l	Finish	Glass Type			
602	915	2535	EX	SC	PTD	-	-	WD	PTD	-	-	VFRS Assistant Chief's Office1	#3
603	915	2535	EX	SC	PTD	-	-	WD	PTD	-	-	VFRS Assistant Chief's Office2	#3
604	915	2535	EX	SC	PTD	-	-	WD	PTD	-	-	Breakout Room	#3
605	915	2535	EX	SC	PTD	-	-	WD	PTD	-	-	VFRS Deputy Chief's Office	#3
607	915	2535	EX	SC	PTD	-	-	WD	PTD	-	-	Meeting Room 2	#3
609	915	2134	NEW	HM	PTD	-	-	PSS	PTD	-	-	IT Cabinet	#2
610	915	2134	NEW	HM	PTD	-	-	PSS	PTD	-	-	WR / Shower	#2

LEGEND

EX EXISTING
NEW NEW
HM HOLLOW METAL

PSS PRESSED STEEL FRAME
PTD PAINTED FINISH
SC SOLID CORE
WD SOLID WOOD

REMARKS

#1. REUSE EXISTING DOOR, RE-PAINT, WITH NEW DOOR FRAME PAINTED
#2. DOOR TYPE AND FRAME TYPE REFER INTERIOR ELEVATIONS
#3. DOOR SIZE IS APPROXIMATE. CONTRACTOR TO VERIFY DOOR SIZE ON SITE PRIOR TO DOOR FRAME FABRICATION.

END OF SECTION 08 06 10

1.0 GENERAL

1.1 DOCUMENTS

.1 This Section of the Specifications forms part of the Contract Documents and is to be read, interpreted and coordinated with all other parts.

1.2 SECTION INCLUDES

.1 Fire rated and non-fire rated pressed steel frames and hollow metal doors.

.2 Glazed style and rail doors and glazed screens and sidelights.

1.3 RELATED SECTIONS

.1	Finish Carpentry	Section 06 20 00
.2	Finish Hardware	Section 08 71 00
.3	Glazing	Section 08 80 00
.4	Painting	Section 09 91 00

1.4 REFERENCES

.1 Underwirter's laboratories of Canada (ULC)
- .1 CAN4-S104-10, Fire Tests of Door Assemblies.
- .2 CAN4-S105-09, Fire Door Frames.

.2 Canadian Steel Door & Frame Manufacturer's Association (CSDFMA).

.3 Regulatory Requirements: To meet the temperature rise and glass area limits for openings prescribed in the National Building Code 2010.

1.5 SUBMITTALS

.1 Shop Drawings:
- .1 Submit shop drawings in accordance with Section 01330, showing typical details of pressed steel frames, including frame schedules and hardware details, to the Consultant for review prior to fabrication.
- .2 Indicate doors and frames bearing ULC labels for ratings, temperature rise and opening classifications.
- .3 Note: Sizes shown on Door Schedule are clear frame opening sizes; base door sizes on clear opening frame sizes.

1.6 PRODUCT DELIVERY STORAGE AND HANDLING

.1 Promptly clean any scratches or disfigurement caused in shipping or handling and touch up with a rust-inhibitive primer. Properly store materials on planks, or dunnage, out of water, and covered to protect them from damage due to any cause. Remove wrappings or coverings upon arrival at the building site and store in a vertical position, spaced by blocking to permit air circulation between them.

2.0 PRODUCTS

2.1 FRAMES

.1	All Exterior Door	16 gauge steel frames
.2	All Interior Door	16 gauge steel frames

.3 Door over 1220mm 14 gauge steel frames

.4 All exterior door frames to be hot dipped galvanized with Z275 designations zinc coatings. Interior frames to be zinc wiped coat galvanized, having zinc coating finish designating of ZF075 to ASTM 525. Shop prime after fabrication. Factory torch up after welding.

.5 Provide adjustable anchors of manufacturer's standard to each frame as required.

.6 Blank, reinforce, drill and tap frames for mortised butts and strike. Protect mortised butts and strike cutouts with metal guard boxes where required.

.7 Reinforce frames when required for surface mounted hardware. Provide drilling and tapping as required for hardware mounting. Hardware preparation and location shall be in accordance with ANSI standard. Prepare each door opening for single rubber bumpers, three (3) for single door opening.

.8 Weld two (2) channel or angle spreaders to doorjambs at bottom of door opening to ensure proper alignment.

.9 Provide frames to be anchored or concrete block or steel stud wall, with anchors of suitable design for new or previously constructed installation as shown on reviewed shop drawings.

.10 Provide ULC or WHI labeled frames for those openings requiring fire protection ratings as determined and scheduled by the Consultant. Provide such frames in accordance with manufacturer's standards and construct as tested and approved by a nationally recognized testing agency having a factory inspection service.

.11 Make provision for glazing as indicated and provide necessary glazing stops to match frames.

.12 Accommodate card reader/electric strike as indicated in door schedule.

.13 Reinforced head of frames wider than 4 feet, reinforce exterior frame assemblies to resist wind load.

.14 Insulation: Rigid modified polyisocyanurate, closed cell type, minimum 32 kg/m², RSI = 1.9.

.15 All exterior door frames to be thermally broken.

2.2 HOLLOW METAL DOORS

.1 All exterior doors to be hot dipped galvanized rib with Z275 designation zinc coatings. Interior doors to be zinc wiped galvanized; having zinc coating finish designation ZF075 to ASTM 525. Both exterior and interior door face to be 18 gauge.

.2 Provide doors of 44.5 mm thick flush panel design and of honeycomb construction.

.3 Provide insulating core materials to doors in manufacturer's standard for fire-rated ULC approved fire doors.

.4 Construct doors in accordance with ULC. Provide doors complete with appropriate ULC label for fire rating and temperature rise.

.5 Provide labeled doors for those openings which require fire protection ratings as determined and scheduled. Ensure such doors are in accordance with manufacturer's standard and/or type of construction as tested and approved by a nationally recognized testing agency having a factory inspection service.

.6 Top and bottom of door closed with recessed channel or flush end closure as per manufacturer's standards. Fill interior voids of doors with sound deadening and insulating core materials.

.7 Provide raceway in the interior of all doors at centre hinge height to accommodate future electrified locksets.

.8 Finish Hardware: Prepare door assemblies for installation of hardware specified in Section 08 71 00.

.9 Refer to Mechanical Drawings for doors with grilles or undercuts.

.10 Glazing: Refer to Section 08 80 00.

.11 Exterior doors: insulated cores filled with rigid foam modified polyisocyanurate.

2.3 FABRICATION

.1 Frames:

.1 Provide frames of welded type, one-piece construction.
.2 Cut mitres and joints accurately and weld continuously on inside of frame profile.
.3 Grind welded corners and joints to flat plane, fill with metallic paste filler and sand to uniform s mooth finish.
.4 Reinforce heads of frames to suit opening width.

.2 Doors:

.1 Mortise, reinforce, drill and tap doors and reinforcements to receive hardware using templates provided by finish hardware supplier.
.2 Make provision for louvres and glazing as indicated and provide necessary glazing stops.
.3 Construct fully glazed doors as true style and rail doors.
.4 Construct matching panels in same manner as doors.
.5 Touch up doors with primer where galvanized finish damaged during fabrication.
.6 Interior and Exterior Doors: Edges fully welded, filled and sanded flush.

3.0 EXECUTION

3.1 INSPECTION

.1 Examine surfaces to which the work of this section is to be applied and ensure that conditions are able to provide a complete and satisfactory installation.

.2 Commencement of work will indicate acceptance of surfaces and conditions.

3.2 INSTALLATION

.1 Place frames prior to construction and enclosing of walls and ceilings. Wherever possible set frames in place prior to placing of concrete unit masonry or steel stud wall. Set frames accurately in position, plumbed, aligned and braced securely until permanent anchors are set. After construction is completed, remove temporary braces and spreaders leaving surfaces smooth and undamaged.

.2 Fit hollow metal doors accurately in their respective frames with plumb, free-swinging, smooth operating and with even margins with the following clearances:

Between doors and frames at head and jamb: 1.5 mm
At Threshold & Finished floor: 12 mm
Between meeting edges of pairs of doors: 3 mm
Hinge side: 1 mm

.3 Clearances to fire rated assemblies shall meet ULC specifications for the Fire Class rating required.
.4 Install fire rated doors and frames in accordance with NFPA 80, latest edition.

3.3 ADJUSTING AND CLEANING

.1 Check and re-adjust operating finish hardware items in hollow metal work just prior to final inspection. Leave work in complete and proper operating condition. Remove and replace defective work including doors or frames, which are warped, bowed or otherwise damaged.

END OF SECTION 08 11 13

1.0. GENERAL

1.1 DOCUMENTS

.1 This Section of the Specifications forms part of the Contract Documents and is to be read, interpreted and coordinated with all other parts.

1.2 SECTION INCLUDES

.1 Wood door frames.

1.3 RELATED SECTIONS

.1	Finish Carpentry	Section 06 20 00
.2	Finish Hardware	Section 08 71 00
.3	Painting	Section 09 90 00

1.4 QUALITY ASSURANCE STANDARDS

.1 Use the "Architectural Woodwork Standard (AWS)" of the Architectural Woodwork Manufacturers Association of Canada (AWMAC), Latest Edition, together with authorized additions and amendments, as a reference standard and as a part of this project specification.

.2 Where modifications to the AWMAC AWS contained within the Manual are included in this project specification, then such modifications shall govern in case of conflict.

.3 Use the AWMAC AWS to define any reference to Institutional or Architectural grade in this specification.

.4 Any item not given a specific quality grade shall be premium grade as defined in the latest edition of the AWMAC AWS.

.5 Ensure wood doors to be used in the project meet the requirements of the AWMAC AWS for the particular grade specified.

.6 Reference in this specification to part and item number means the parts and items contained within the AWMAC AWS Manual.

.7 Wood doors shall be of specified grade as defined by AWMAC AWS Manual. Premanufactured doors meeting AWMAC standards may be accepted.

.8 Doors, doors frames and transom panels shall be manufactured by a single source millwork contractor who has adequate plan, equipment, and skilled tradesman to furnish doors, door frames/transom panels meeting the specified requirements.

1.5 DEFINITIONS

.1 Exposed surfaces: Surfaces visible when doors are opened, backs of hinged doors and edges of hinged doors exposed when opened.

.2 Pre-machined: Factory prepared cut-outs for hardware. Site trimming of work will not be permitted, except trimming of door height.

1.6 SUBMITTALS

.1 Samples:

.1 Sample for Verification, Painted Door: Submit one 300mm x 300mm corner sample showing construction, edge details, core and face painted in selected finish (shop finished).

.2 Sample for Verification, Painted Transom Panel: Submit one 300mm x 300mm corner sample showing construction, edge details, core and face painted in selected finish (shop finished).

.3 Sample for Verification, Painted Frame: Submit one 300mm long corner sample showing profiles, jointing method, face veneer in selected finish (shop finish).

.4 Control Samples, Factory Finish: Submit duplicate 300 mm x 300 mm factory finished paint samples on representative substrates. Resubmit samples until approval is granted.

.2 Shop Drawings: Indicate location, size, and hand of each door; elevation of each kind of door; construction details; location and extent of hardware blocking; and other pertinent data:

.1 Dimensions and location of cut-outs, mortises, glazing and holes for hardware.

.2 Factory finish requirements.

.3 Jointing, fastening and related items.

.3 Provide four (4) copies of maintenance data for cleaning and maintenance of wood painted doors, frames and transom panels for incorporation into the operation and maintenance manuals.

1.7 PRODUCT DELIVERY, STORAGE AND HANDLING

.1 Package doors and transoms individually in cardboard cartons and wrap bundles of doors and transoms in plastic sheeting.

.2 Wrap bundles of frames in plastic sheeting.

.3 Ensure complete protection of edges and finishes during shipment to the job site.

.4 Mark each door and transom on top and bottom rail with opening number used on Shop Drawings.

.5 Do not deliver doors until conditions are suitable and doors are actually required for installation.

.6 Store doors in a dry place; off floor; free from extremes of temperature; properly stacked and protected according to manufacturer's and the Architectural Woodwork Manufacturer's Association directions.

1.8 PROJECT CONDITIONS

.1 Environmental Limitations: Do not deliver or install work until building is enclosed, wet work is complete and HVAC system is operating and will maintain temperature and relative humidity at occupancy levels during the remainder of the construction period.

1.9 WARRANTY

.1 Furnish the Owner with a two (2) year AWMAC Guarantee or a two (2) year company's Maintenance Bond, to the full value of the Wood Doors subcontract, certifying that the Wood Doors have been manufactured and installed in accordance with the standards incorporated in the AWMAC AWS Manual (Latest Edition).

.2 The Guarantee shall cover replacing and refinishing to make good defects in wood doors due to faulty workmanship or defective materials, which appear during a two (2) year period following the date of Substantial Performance of the Contract.

1.10 INSPECTION

.1 Manufacture and install wood doors to the specified AWMAC AWS. Wood doors shall be subject to an inspection at the plant and site by an appointed inspector, approved by the local chapter of AWMAC.

.2 Replace any work, which does not meet AWMAC AWS as specified, at no additional costs to the Owner and to the satisfaction of the Consultant and the inspector.

2.0 PRODUCTS

2.1 DOOR FRAMES

.1 Interior Frames:

.1 AWMAC Custom Grade.

.2 Solid popular wood, paint finish.

.3 Corners to be dowel type construction with exposed edges to AWMAC Standard.

2.2 FABRICATION

.1 Frames:

.1 Fabricate work square and to the required lines. Use wood members in maximum lengths obtainable, free from bruises, blemishes, mineral marks, knots, shake and other defects.

.2 Fabricate frames in medium density fibreboard core and finish in paint finish.

.3 Machine and hand sand surfaces exposed in the finished work to an even, smooth surface free from defects detrimental to appearance. Mitre all corners. Recess and conceal fasteners and anchor heads. Fill with matching wood plugs.

.4 Glue and blind screw or nail and properly frame material with tight, hairline joints and hold rigidly in place. Locate prominent joints where directed. Glue and pin mortise and tenon joints. Intermediate joints between supports will not be permitted.

.2 Preparing new wood door frame to receive existing door hardware.

3.0 EXECUTION

3.1 INSTALLATION

.1 Specified in Section 06 20 00.

.2 Provide even margins between doors and jambs and doors and finished floor as follows:

.1 Hinge Side: 3 mm

.2 Latch side and head: 3 mm

.3 Finished floor: 12 mm

3.2. PREPARATION

.1 This contractor shall include for preparation/installation of hardware supplied in Section 08 71 00.

3.3 PROTECTION

.1 Protect existing doors and new frames on site from construction damage until space is ready to be turned over to the Owner for move in.

END OF SECTION 08 14 00

1.0 GENERAL

1.1 REQUIREMENTS INCLUDED

.1 Furnish all labor, material, equipment and services necessary for the supply to the site, of the Finish Hardware as indicated on the drawings, schedules and specified herein.

.2 Include also the furnishing of all templates and schedules required by manufacturers of hollow metal doors and pressed steel frames and other such work to enable the manufacturers to make proper provisions in their work to receive the Finish Hardware.

.3 All Finish Hardware to made to conform to A.N.S.I. standard dimensions.

1.2 RELATED REQUIREMENTS

.1	Finish Carpentry (installation of finish hardware)	Section 06 20 00
.2	Hollow Metal Doors and Frames	Section 08 11 13
.3	Wood Doors	Section 08 14 00

1.3 QUALITY ASSURANCE

.1 Standards:
In all cases where C.G.S.B. (Canadian Government Specifications Board), C.S.A (Canadian Standards association), ASTM (American Society for Testing and Materials), or other standards are quoted, this shall be taken to mean the latest edition of that particular standard including all revisions.

.2 Materials shall conform to those as specified, in brand and quality, unless otherwise approved in writing by the Consultant. No claim as to their unsuitability or unavailability or this Subcontractor's unwillingness to use the same, will be considered, unless such claims are made in writing prior to the closing of bids.

.3 Qualifications:
Hardware supplier shall be an established contract builders hardware firm who shall have in his employ one or more A.H.C. (Architectural Hardware Consultant) who are members in good standing of the DHI (Door and Hardware Institute)and who will be responsible for the complete hardware contract.

1.4 SUBMITTALS

.1 Samples:
If required by the consultant, a returnable sample of each item of proposed hardware shall be submitted for approval not later than ten (10) days after requested. Samples to be properly tagged, indicating name of supplier, name of manufacturer, item number, intended function and location. Installed item to equal in all respects to approved samples.

.2 Submit the following to Consultant:

.1 Five (5) copies of a detailed hardware schedule for the Consultant's approval within two (2) weeks of being awarded this contract.

.2 Indicate manufacturer's name and article number in complete detail including active hands of pairs of doors, degree of opening and other information pertinent to the intended function of the door and frame details.

.3 In addition to hardware, the schedule shall include, for each heading or group of doors, Consultant's door reference number as per Door Schedule, the room designations, door size and material and label requirements.

.4 The schedule shall also incorporate detailed keying for final approval by the owner.

.5 Provide "as-installed" hardware list, including name of supplier, to the Consultant upon substantial performance of the contract.

.6 List to be complete with key to explain manufacturer's names, abbreviations and codes.

.7 Templates shall not be issued or material supplied until the hardware list has been approved. Provide additional copies of the hardware lists to the Consultant on request.

1.5 COMPLIANCE WITH REGULATIONS

.1 The hardware supplier shall check the listed hardware for compliance with local fire codes and regulations regarding required hardware for fire doors and report to the Consultant, any discrepancies or omission in the listed hardware in this respect. Failure to report any such discrepancies of omission render supplier responsible for cost of rectification.

1.6 PRODUCT DELIVERY, STORAGE AND HANDLING

.1 All hardware shall be delivered to the site in accordance with the construction schedule prepared by the Contractor. All hardware shall be inspected on site for compliance to specifications before installation, stored in the original sealed packages in a locked, secure place until required for installation. The Contractor will be responsible for receiving and storing of hardware at the site. Hardware suppliers shall tag and deliver any sealed packages to the contractor.

.2 Hardware shall be supplied complete with required screws, bolts and fastenings necessary for proper installation, wrapped in paper and packed in the same package as hardware. Each package shall be legibly labeled indicating that portion of work for which it is intended. Door hardware to delivered unopened original boxes.

.3 Mail one copy of hardware delivery sheets to the Consultant at time of each shipment.

1.7 TEMPLATES

.1 Templates shall be supplied by the hardware supplier to all trades requiring them.

1.8 GUARANTEE

.1 All Finish Hardware, except door closers shall be guaranteed by the hardware manufacturer, by written certification, for a period of one (1) year from certified date of substantial performance against any defects in the design, materials, finish, function and workmanship and that any defects will be made good by the manufacturer at no additional cost to the owner. A similar guarantee for a ten (10) year period shall be provided for door closers by the manufacturer.

2.0 PRODUCTS

2.1 MATERIALS

.1 Hardware shall be best grade, entirely free from imperfections in manufacture and finish and shall be supplied in accordance with the hardware list specified herein.

.2 The following list of manufactures and products are considered approved for this project and no variations from the listed and pre-approved items will be permitted.

.3 Installed item to be equal in all respects to approved samples.

.4 Supply all templates as required. Frame manufacturer will allow for maximum swing of doors when templating for closers. On pairs of doors RHR Leaf is to be active unless otherwise noted.

.5 Any doors not listed shall have hardware as listed for similar locations.

.6 Package hardware with all necessary screws and fittings, clearly labeled with door number as per Door Schedule, as to intended location. Included all necessary installation instructions.

2.2 APPROVED MANUFACTURERS

.1 Use one manufacturer's product only for all similar items.

.2 The following is a list of approved manufacturers:

.1 Butts: McKinney, Hager & Stanley

.2 Locks/Latches Adams Rite

.3 Closers: Norton 8501BF series
Note: -All closers to meet all Handicapped requirements.

.4 Pulls: Rockwood, Gallery, Hager
Note: -All pulls to be through bolt mounted unless otherwise specified.

.5 Electric Hardware: Folger Adams

2.3 KEYS AND KEYING

.1 All locks to be keyed to the existing and with a temporary construction keying system.

.2 Permanent keys and cylinders shall be marked with the applicable blind code for identification.

.4 Supply:

.1 3 Ea. Keys per lock or cylinder.
.4 2 Only construction keys

.5 Obtain details of keying from the Owner before ordering. Allow sufficient type line spacing to allow the owner to insert keying information after each Lock or Cylinder.

.6 Note:
.1 All cylinders to be factory keyed and shipped installed in locks by contractor.
.2 Construction keys only to Contractor at site.
.3 Master keys, blank keys, operating keys, and extractor keys to be sent via registered mail by factory direct to the Owner or the Owner's representative.

3.0 EXECUTION

3.1 INSTALLATION

.1 Installation will be done under other sections.

3.2 HARDWARE MOUNTING

.1 Shall be in accordance with the recommended locations as per standard locations for builders hardware locations (metric) as listed in Canadian Metric conversion Guide for Steel Doors and

Frames prepared by the Canadian Steel Door and Frame Manufacturers association and B.C. Code for the Physically and Visually Handicapped.

3.3 ATTACHMENT

.1 Include all necessary screws, special screws, bolts, special bolts, expansion shields, and other devices required for proper hardware application.

3.4 COORDINATION

.1 Confer with the various sections of work to be sure that they will conform to and fit actual conditions on the job.

4.0 SCHEDULE

4.1 FINISH HARDWARE SCHEDULE

.1 The following hardware set schedule is provided as a comprehensive guide to define the quality, functions, design, type and finish of required finish hardware and defines requirements for one (1) opening only. See door schedule for quantities of required sets.

.2 Examine hardware set schedule, door schedule and all contract documents for the true quantities of hardware required, their exact location, function and operation, and check delivered items to ensure that all requirements are met.

.3 FINISH HARDWARE SET SCHEDULE

Hardware Set 01 – Door 609

QTY	Description	Finish
3 EA	Medium Duty Hinges non-removable	652
1 EA	Surface Closer parallel arm	689
1 EA	Store room function lock set, level handle	626
1 EA	S.S. Kick plate 305mm high by door width	630
1 EA	Overhead Stop	626

Hardware Set 02 – Door 610

QTY	Description	Finish
3 EA	Medium Duty Hinges non-removable	652
1 EA	Surface Closer parallel arm	689
1 EA	Privacy Lock, level handle	626
1 EA	S.S. Kick plate 305mm high by door width	630
1 EA	Overhead Stop	626

1.0 GENERAL

1.1 DOCUMENTS

.1 This Section of the Specifications forms part of the Contract Documents and is to be read, interpreted and co-ordinated with all other parts for glazed partitions and sliding doors, and not less than 6mm thick for wood doors.

1.2 SECTION INCLUDES

.1 Glazing as shown on the drawings and as specified herein.

1.3 RELATED SECTIONS

.1 Sealants and Caulking Section 07 92 00

.2 Wood Door Section 08 14 00

1.4 REFERENCES

.1 Vancouver Building Bylow 2014.

.2 Sealant insulating glass units to conform to the Insulating Glass Manufacturers' Association of Canada (IGMAC) standards.

.3 Canadian General Standards Board (CGSB)

- .1 CAN/CGSB-12.1 – Tempered or Laminated Safety Glass.
- .2 CAN/CGSB-12.2 – Flat, Clear Sheet Glass
- .3 CAN/CGSB-12.3 – Flat, Clear Float Glass.
- .4 CAN/CGSB-12.8 – Insulating Glass Units.
- .5 CAN/CGSB-12.9 – Spandrel Glass.
- .6 CAN/CGSB-12.11 – Wired Safety Glass.

1.5 SUBMITTALS

.1 Submit samples and shop drawings in accordance with Section 01330.

.2 Submit maintenance and cleaning instructions for incorporation into maintenance manuals.

1.6 SOURCE QUALITY CONTROL

.1 The work of this section shall be installed, glazed and adjusted by experienced workmen in accordance with manufacturer's directions.

.2 All glass shall be installed in a perfectly true, plumb and accurate location.

1.7 PRODUCT DELIVERY, STORAGE AND HANDLING

.1 Deliver, handle and store glass by methods approved by manufacturer. Stack all glass vertically to prevent cracking. Do not remove from protective cases or other protective covering until ready for installation.

1.8 WARRANTY

.1 Provide manufacturer's warranty in writing for insulating glass units against failure of seal of enclosed air space and deposits on inner faces of glass detrimental to vision for a period of 2 years from date of substantial performance of work.

2.0 PRODUCTS

2.1 GLASS MATERIAL

.1 Glass thicknesses: Indicated or to industry standards for size of opening, local wind loading and use, but shall not be less than 10 mm thick for glazed partitions and sliding doors, and not less than 6mm thick for wood doors.

.2 All glass to be safety glasses: To CAN/CGSB-12.1.
- .1 Tempered: Free of tong marks in final position.
- .2 Laminated: Plastic interlayer sandwiched between 2 layers of minimum 6mm thk glass.
  - .1 Vertical applications: Use 0.38 mm thick plastic interlayer.

.3 Silvered Mirror Glass: To CAN/ CGSB-12.5, Type 1A - float glass, 6 mm thick, edges ground and polished.

2.2 GLAZING AND SEALING COMPOUND MATERIALS

.1 Sealant Compounds:
- .1 Concealed within framing: CGSB 19-GP-5M acrylic terpolymer in accordance with Section 07 92 00.
- .2 Exposed to view: CAN2-19.24 expoxidized polyurethane terpolymer in accordance with Section 07 92 00.

.2 Glazing tape: Preformed macro-polyisobutylene tape with continuous integral neoprene shim, paper release, black colour, width x thickness recommended by manufacturer to suit installation.

.3 Setting blocks: Neoprene, Shore “A” durometer hardness 79-90, 100 mm long x 6 mm high x widths to suit glass and insulating glass units.

.4 Glazing splines/wedges: Purpose-made extruded neoprene profiles designed to engage aluminum extrusions and form integral part of respective framing system.

.5 Gaskets: Purpose-made extruded hollow compressible EPDM or neoprene profiles designed to engage aluminum extrusions and form integral part of framing system.

.6 Primers, sealers and cleaners: To glass manufacturer’s standard.

2.3 GLAZING FILM

.1 Frosted Glazing Film:
- .1 Materials: Privacy glazing film for interior and exterior application
- .2 Film Thickness: 2 mil.
- .3 Shading Coefficient: 0.44%
- .4 Visible Light Reflectance: 43%
- .5 Visible Light Transmittance: 21%
- .6 Heat Transmission Coefficient: 5.9W/m² K
- .7 Roll Size: 1270mm wide x 30m long
- .8 Flammability: ASTM E84 Class 1(A)
- .9 Color/Design: Opaque / Frost
- .10 Locations: 600mm high horizontal band at 600mm from floor full width of existing/new floor mount glazed panel

3.0 EXECUTION

3.1 INSPECTION

.1 Examine the drawings and the site to ascertain fabrication and installation procedures so that the work may be carried out with a minimum of job site cutting and fitting. Supplement all drawing information with actual job site dimensions.

3.2 INSTALLATION - GENERAL

.1 All glass shall be cushioned and rattle free. Draw marks shall be installed horizontally unless prohibited by the size of the sheet.

.2 Install all glass on glazing blocks with spacer blocks, of sizes required to ensure shim spaces as recommended by the glass manufacturer with adequate space for glazing compounds and sealants.

.3 Fill gap between glass and applied stop with sealant to depth equal to bite of frame on glass but not more than 10 mm below sightline.

.4 Apply sealant to uniform and level line, flush with sightline and tooled or wiped with solvent to smooth appearance.

3.3 INSTALLATION: MIRRORS

.1 Set mirrors with adhesive, applied in accordance with adhesive manufacturer's instructions.

.2 Set mirrors with clips. Anchor rigidly to wall construction.

.3 Set in frame.

.4 Place plumb and level.

3.4 INSTALLATIONS: GLAZING FILM

.1 Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.

.2 Install in accordance with manufacturer’s instructions.

.3 Upon completion of film application, allow 30 days for moisture from film installation to dry thoroughly, and to allow film to dry flat with no moisture dimples when viewed under normal viewing conditions.

.4 After application of film, wash film using common window cleaning solutions, including ammonia solutions, 30 days after application. Do not use abrasive type cleaning agents and bristle brushes to avoid scratching film. Use synthetic sponges or soft cloths.

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.

.1 Remove traces of primer, caulking.

.2 Remove glazing materials from finish surfaces.

.3 Remove labels.

.4 Clean glass and mirrors using approved non-abrasive cleaner in accordance with manufacturer's instructions.

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

3.6 PROTECTION

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

.2 After installation, mark each light with an "X" by using removable plastic tape or paste.

.1 Do not mark heat absorbing or reflective glass units.

.3 Repair damage to adjacent materials caused by glazing installation.

END OF SECTION 08 80 00

FINISH SCHEDULE

NO.	ROOM NAME	FLOORS	BASE	WALLS				CEILING	REMARKS
				WEST WALL	NORTH WALL	EAST WALL	SOUTH WALL		
601	Open Workstations 1	CPT	RB	EX/PTD	EX	PTD	EX/PTD	EX	
602	VFRS Assistant Chief's Office 1	CPT	RB	PTD	PTD	PTD	EX	EX	
603	VFRS Assistant Chief's Office 2	CPT	RB	PTD	PTD	PTD	EX	EX	
604	Breakout Room	CPT	RB	PTD	EX/PTD	EX/PTD	PTD	EX	
605	VFRS Deputy Chief's Office	CPT	RB	PTD	PTD	PTD	PTD	EX	
606	Open Workstations 2	CPT	RB	EX/PTD	EX/PTD	EX	PTD	EX	
607	Meeting Room	CPT	RB	PTD	PTD	EX	EX	EX	
608	Print / Copy	CPT	RB	PTD	EX	PTD	PTD	EX	
609	IT Cabinet	AVT	RB	PTD	PTD	PTD	PTD	EX	
610	Accessible Washroom / Shower	EF	EP	EP	EP	EP	EP	EX	
611	Open Workstations 3	CPT	RB	EX	PTD	PTD	EX	EX	
612	Break Area	LN	RB	PTD	PTD	EX/PTD	PTD	EX	
613	Workout Room	RF	RB	EX	-	PTD	PTD	EX	
614	Hallway	CPT	RB	EX	EX	EX/PTD	PTD	EX	
615	Open Library	CPT	RB	EX	EX	EX	EX	EX	

LEGEND

FLOOR

AVT	Anti-Static Vinyl Tiles
CPT	Carpet Tiles
EF	Epoxy Flooring
LN	Linoleum Sheet Flooring
RF	Sports Rubber Flooring

BASE

EP	Epoxy Coved Base
RB	Rubber Base

WALLS

EP	Epoxy Wall Coating
EX	Existing re-paint
GL	Glazed
PTD	Painted

CEILING

EC	Exposed Ceiling
EP	Epoxy Wall Coating on GWB
EX	Existing acoustic T-bar ceiling

GENERAL NOTES

1. Washroom / shower room to be installed with moisture resistant gypsum wallboard in both walls and ceiling.
2. Where specific product type is not specified herein, refer to interior elevations, finishes plans & reflected ceiling plans for detail.
3. All Finishes to be new U.N.O.
4. Provide waterproof membrane under all epoxy floor and full height of walls on all 3 sides of the shower.
5. All wall finishes and wall base to be continuous behind mirror and all washroom accessories.

REMARKS

END OF SECTION 09 06 00

1.0 GENERAL

1.1 DOCUMENTS

.1 This Section of the Specifications forms part of the Contract Documents and is to be read, interpreted and coordinated with all other parts.

1.2 SECTION INCLUDES

.1 Supply and installation of interior steel studs and furring.

.2 Seismic restraints for suspended ceiling framing.

1.3 RELATED SECTIONS

.1	Rough Carpentry	Section 06 10 00
.2	Finish Carpentry	Section 06 20 00
.3	Thermal Insulation	Section 07 21 00
.4	Sealant and Caulking	Section 07 92 00
.5	Hollow Metal Door and Frame	Section 08 11 13
.6	Wood Doors	Section 08 14 00
.7	Gypsum Board	Section 09 29 00

1.4 REFERENCES

.1 CAN/CGSB-7.1-M86, "Cold Formed Steel Framing Components".

.2 ASTM A446/A446M-85, "Specification for Steel Sheet, Zinc-Coated (Galvanized) by the Hot-Dip Process, Physical (Structural) Quality".

.3 ASTM A525-86, "Specification for General Requirements for Steel Sheet, Zinc-Coated (Galvanized) by the Hot-Dip Process".

.4 Association of Wall and Ceiling Contractors of B.C. (AWCC), "Specification Standards Manual", Latest Edition.

1.5 DESIGN CRITERIA

.1 Design steel studs without relying on sheathing to resist torsion and weak axis buckling.

.2 Design steel stud deflection head to allow for deflection of building structure. The building structure is designed with a maximum deflection of 1/360.

1.6 QUALITY ASSURANCE

.1 Steel stud and furring work shall be in accordance with Association of Wall and Ceiling Contractors of B.C. (AWCC), "Specification Standards Manual", Section 9.7, Interior Steel Studs and Furring, Section 9.8 Exterior Steel Stud Wall System and Section 9.10, Gypsum Shaft Wall Systems and performed by a qualified specialist firm employing skilled mechanics to Vancouver Building Bylaw.

.2 Design suspended bulkhead framing, horizontal duct enclosures and wall framing for wall supported equipment (e.g. wall hung, cupboards, wall hung dryers, fire hose cabinets, electrical, telephone, cable panels, video monitors, etc.) to accommodate dead loads as well as seismic loading.

.3 Provide seismic restraints for all suspended ceiling framing.

.4 All interior steel stud walls shall be engineered by a Professional Engineer, according to specified design criteria. Provide signed and sealed shop drawings by the Engineer.

.5 Said engineers shall review installation of all such components and issue VBBC letters of assurance or model Schedule S-B and S-C, stating that the components have installed in accordance with design and Vancouver Building Bylaw 2014 requirements.

.6 The cost of engineering shall be included in the cost of the Work.

.7 Weld in accordance with CSA W59-M1989 for steel using qualified welders certified in accordance with CSA W47.1-1983 and CSA W55.3-1965.

1.7 PRODUCT DELIVERY, STORAGE & HANDLING

.1 Store packaged material in original containers with manufacturer's seals and labels intact.

.2 Prevent damage to materials during handling and storage. Keep materials under cover and free from dampness.

1.8 SITE CONDITIONS

.1 Start no work until conditions are satisfactory. Commencement of work shall imply acceptance of conditions.

1.9 SEQUENCING & SCHEDULING

.1 Co-ordinate installation sequence of steel studs partitions and furring with the other work and materials and/or services being installed within the partitions and metal furring.

.2 Coordinate steel stud and furring work with other work on which it is in any way dependent. Ensure correct positioning and installation of other work with which steel stud partitions have to align and upon which subsequent work is dependent.

2.0 PRODUCTS

2.1 MATERIALS

.1 Steel Studs & Steel Stud Furring:

.1 Conform to CAN/CGSB-7.1-M86, non-loadbearing; C-shape, hot dipped galvanized steel studs with Z180 (G60) zinc coating to ASTM A525-86, roll formed from ASTM A446/A446M-85, Grade A steel.
Studs to have knurled face and pre-punched pass-through holes for horizontal runs of wiring and piping. Length to suit, no splicing allowed.

.2 Flange: Depth not less than 32mm , edges bent back 90 deg. and edges hemmed 5mm minimum.

.3 Widths: As scheduled and indicated.

.4 Gauges: Interior steel stud to be a minimum of 0.88mm (20 gauge). Interior door jamb studs: 0.88 mm (20 gauge), two (2) studs each side of opening. Increase gauge of steel studs at over-height locations to suit stud manufacturer's design tables, in order to maintain overall partition dimension as detailed in wall schedule and in accordance with the BC Building Code. Exterior steel stud to be minimum1.23 mm (18 gauge).

.5 Colour code steel studs for gauge in accordance with AWCC colour code chart.

.2 Stud Tracks:

.1 Top and bottom runner tracks fabricated from same materials as studs; leg design min. 32mm high, slightly bent in to hold studs; widths to equal stud width.

.2 Use extended leg top track to partitions as required for deflection.

.3 Stud Fasteners: Manufacturer's standard, suitable for intended application.

.4 Shaft Wall Framing Supports: Stud and track metal components fabricated from hot-dipped zinc coated steel meeting ASTM A446/A446M-85, Grade A to conform to ASTM C645-83. Zinc coating shall be Z180 (G60) to ASTM A525-86. Steel I-studs, J-tracks, T-splines, L-runners, fasteners shall be of design and gauge as used within appropriate shaft wall system tested under design numbers indicated in wall schedule.

.5 Furring Channels: Hat section; roll formed from 0.53mm hot dipped galvanized steel having a Z180 (G60) coating to ASTM A525-86, dimensions 68.2 mm or 66.7mm overall width, face width 35 mm by 22.2mm deep, face knurled.

.6 "Z-bar" Furring: Roll formed from 0.46mm (26 ga.) hot dipped galvanized steel having a Z180 (G60) coating to ASTM A525-86, 32mm face dimension x depth to suit rigid insulation thickness, see drawings and wall schedule.

.7 Gypsum Board Ceiling Framing: Conform to Section 9.7 , Part 2, Item 4 of the A.W.C.C. Standards which are minimum and as otherwise described below to exceed that minimum.

.1 Tie Wire: 1.62mm (16 ga.) galvanized steel tie wire.

.2 Hangers: 3.6mm (9 ga.) diameter galvanized soft annealed steel wire, or 4.8mm diameter zinc coated or cadmium plated steel rods. Ceiling area supported:

Area	Size of Hangers
Up to 1.15m^2	3.6 mm (9 ga.) diameter galvanized wire.
Up to 1.48 m^2	4.8mm diameter rods

.3 Inserts: Able to develop full strength of supported hangers.

.4 Main Carrying Channels: Cold formed steel channels of dimension and weight as follows and protected with rust inhibitive coating. Main carrying channels shall not be less than 38mm x 12.7mm x 1.37mm cold formed channels.

Maximum Spacing of Hangers	Maximum Spacing of Main Runners
900mm	1200mm
1000mm	1000mm
1200mm	900mm

.5 Cross Furring/Ceilings: Cross furring members shall be hat-shaped furring channels as specified in Clause 2.5, above. Max. spacing between furring channels shall conform to the following requirements, based on gypsum board thicknesses and layers.

.8 Metal Backing Plates: Flat sheet from 0.91mm (20 ga.) thick galvanized steel of same type as are the studs as blocking to support work of other sections.

Gypsum Board Thickness	Maximum Furring Spacing
Single 12.7mm board	400 mm
Single 15.9mm board	600 mm
Double layer	400 mm

3.0 EXECUTION

3.1 STEEL STUDS - ERECTION

.1 Steel stud wall types are designated on the Drawings in accordance with wall types listed in Wall Construction Schedule conforming at least to Section 9.9, Part 3, Items 1 and 2 of the A.W.C.C. Standards.

.1 Fire Resistance Rated Walls: Comply with requirements of testing agency approved by the Consultant for wall systems detailed on Drawings.

.2 Install stud tracks at floor and ceiling, accurately align according to partition layout, secure at centres at max. 600mm o.c. or spacing as shown on wall schedule, whichever is less, using recommended fasteners in accordance with steel stud manufacturer's design load tables (table 9.8) for stud gauges required.

.3 Place studs vertically at centers as detailed in wall schedule and not more than 50 mm from abutting walls, and at each side of openings and corners. Position studs in tracks at floor and ceiling. Cross brace steel studs as required to provide rigid installation to manufacturer's instructions and code requirements. Stud height and spacing limitations shall be in accordance with stud manufacturer's recommendations.

.4 Erect metal studding to tolerance of 1:1000.

.5 Attach studs to bottom and ceiling tracks using screws, subject to the requirement in 3.1.13.

.6 Co-ordinate simultaneous erection of studs with installation of service lines. When erecting studs ensure web openings are aligned.

.7 Co-ordinate erection of studs with installation of door/window frames and special supports or anchorage for work specified in other Sections.

.8 Provide two studs extending from floor to ceiling at each side of openings wider than stud centres specified. Secure studs together, 50 mm apart using column clips or other approved means of fastening placed alongside frame anchor clips with any additional framing members/bracing incorporated around perimeter to adequately resist loads.

.9 Erect track at head of door/window openings and sills of sidelight/window openings to accommodate intermediate studs. Secure track to studs at each end, in accordance with manufacturer's instructions. Install intermediate studs above and below openings in same manner and spacing as wall studs.

.10 Provide and install backing and/or reinforcing within steel stud partitions for items being hung from or anchored to such partitions or furring.

.11 Install steel studs or furring channel between studs for attaching electrical and other boxes.

.12 Extend partitions to full height to underside of structure except where noted otherwise on drawings.

.13 Maintain clearance under beams and structural slabs to avoid transmission of structural loads to studs. Use special track with extended sides where ceiling track is to be anchored to underside of structure to allow for deflection. Cut studs shorter than partition height.

.14 Install continuous track sealant tape to isolate studs from uninsulated surfaces and to seal perimeter of exterior walls.

.15 Install continuous acoustical separation tape behind studs and tracks around perimeter of sound control partitions.

.16 Provide clearances and isolation felt to ensure no contact between steel stud system and adjacent metal components to eliminate electrolytic action.

3.2 CHASE WALLS

.1 Construct chase walls where indicated, consisting of two parallel steel stud partitions as detailed in wall schedule. Comply with requirements specified for steel stud erection.

.2 Provide cross bracing consisting of 12.7 mm gypsum wallboard 300 mm deep, at quarter points, on each pair of studs. Attach cross bracing to studs with 3 drywall screws.

.3 Co-ordinate construction of chase walls to suit installation of services.

3.3 SHAFT WALL ERECTION

.1 At shaft wall partitions, use the methods of assembly as used in the fire test specimen to maintain fire and sound ratings. Coordinate with Section 09 29 00, Gypsum Board.

.2 Coordinate construction of shaft walls to suit installation of services.

3.4 CEILING & SOFFIT SUSPENSIONS

.1 Hangers:

.1 Ensure hangers for suspended gypsum board ceilings support independent of walls, columns, pipes, ducts, and are erected plumb and securely anchored to structural frame or imbedded in concrete slabs. Do not use powder actuated fasteners/anchors.

.2 Space hangers at 1200mm maximum centers along runner channels and not more than 150mm from boundary walls, interruptions of continuity and change in direction.

.3 Provide at least 25mm clearance at walls.

.2 Runner Channels:

.1 Space channels at max. 900mm centers and not more than 150mm from boundary walls, interruptions of continuity and change in direction. Provide clearance of at least 25mm at walls.

.2 Run the channels transversely to structural framing members.

.3 Where splices are necessary, lap members at least 200mm and wire each end with 2 loops. Avoid clustering or lining up splices.

.4 Attach to rod hangers by bending hanger sharply under bottom flange of runner and securely wire in place with a saddle tie.

.3 Cross Furring:

.1 Erect furring channels transversely across runner channels, or other supports.

.2 Space furring channels at 400mm centers and not more than 150mm from boundary walls, openings, interruptions in ceiling continuity and change in direction. Provide a clearance of at least 25mm at walls.

.3 Secure furring channels to each support with clips or double 1.22 mm (18 ga.) dia. wire ties. Splice joints by nesting and tying channels together.

.4 Level furring channels to a maximum tolerance of 1:1000.

.4 At openings, including ceiling access panels, in ceiling suspension system that interrupts the main carrying channels of furring channels, reinforce grillage with 19 mm cold rolled channels, wire tie to top and parallel to main runner channels, extend 19 mm channels minimum 300 mm past each end of openings.

3.5 WALL FURRING

.1 Place furring channels attached to masonry or concrete surfaces at 400mm o.c. and not more than 100mm from corners and openings.

.2 Secure flanges to wall with hardened nails, power actuated fasteners or equivalent fastenings. Maximum spacing 600 mm alternating to opposite flanges.

3.6 ADJUSTING AND CLEANING

.1 Remove debris resulting from the work of this section upon completion.

END OF SECTION 09 22 00

1.0 GENERAL

1.1 DOCUMENTS

.1 This Section of the Specifications forms part of the Contract Documents and is to be read, interpreted and coordinated with all other parts.

1.2 SECTION INCLUDES

.1 Gypsum board on studs, furring, suspended ceilings and bulkhead.

.2 Acoustical insulation.

1.3 RELATED SECTIONS

.1	Firestopping and Smoke Seals	Section 07 80 00
.2	Sealants & Caulking	Section 07 92 00
.3	Supports for Plaster & Gypsum Board	Section 09 22 00

1.4 REFERENCES

.1 Association Wall & Ceiling Contractors BC (AWCC) "Specification Standards Manual".

.2 CAN/CSA-A82.27-M91, "Gypsum Board Products".

.3 Underwriters' Laboratories of Canada (ULC).

.4 CSA A101-M1983, "Thermal Insulation, Mineral Fibre, for Buildings".

1.5 QUALITY ASSURANCE

.1 Gypsum board shall be in accordance with Association of Wall and Ceiling Contractors of B.C. (AWCC), "Specification Standards Manual", Section 9.6, Gypsum Wallboard and performed by a qualified specialist drywall firm employing skilled mechanics.

1.6 PRODUCT DELIVERY, STORAGE & HANDLING

.1 Store packaged material in original containers with manufacturer's seals and labels intact.

.2 Prevent damage to materials during handling and storage. Keep materials under cover and free from dampness.

1.7 SITE CONDITIONS

.1 Ensure temperature of surrounding areas is within the recommended range; min. 13^{o}C, maximum 21^{o}C, twenty-four (24) hours before, during and after entire gypsum wallboard and joint treatment operations. Avoid concentrated or irregular heating during drying.

.2 Ensure proper ventilation to eliminate excessive moisture.

.3 Start no work until conditions are satisfactory, commencement of work shall imply acceptance of conditions.

2.0 PRODUCTS

2.1 MATERIALS

.1 Gypsum board products, materials and accessories shall conform to AWCC Section 9.6, Part 2 and as follows.

2.2 GYPSUM BOARD

.1 Gypsum Wallboard: Conforming to CAN/CSA-A82.27-M1977 noncombustible gypsum core surfaced on face side with ivory coloured paper and on back side with grey paper; tapered longitudinal edges, thickness 12.7mm; dimensions 1219mm x max. practical length for min. joints. All gypsum wallboard ceiling to be 15.9 mm thk.

.2 Fire-Rated Gypsum Wallboard: Conforming to CAN/CSA-A82.27-M91, Type "X" having ULC label for fire-resistance rating; tapered longitudinal edges, thickness 15.9mm; dimensions 1219mm x max. practical length to minimize joints.

.3 Moisture Resistant Gypsum Wallboard: Conforming to CAN/CSA-A82.27-M91; specially formulated core to resist moisture penetration covered with multi-layer face and back papers chemically treated to resist moisture penetration. Tapered longitudinal edges, thickness 12.7mm; dimensions 1219mm x max. practical length for min. joints. Type "X" having a ULC label for Fire Endurance Rating. All moisture resistant gypsum wallboard ceiling to be 15.9mm thk.

All gypsum board in washroom/shower #610 to be moisture-resistant Gypsum wall board.

2.3 FASTENINGS & FINISHINGS

.1 Drywall Screws: Conforming to ASTM C646, self-drilling, self-threading case hardened screws with Phillips type head (bugle head). On steel studs and furring drywall screws shall have a min. penetration of 12.7mm, as follows:

Single Layer:	12.7 mm	#6 screw 25.4 mm
	15.9 mm	#6 screw 28.6 mm or 31.8
Double Layer:	12.7 mm	#7 screw 41.3 mm
	15.9 mm	#7 screw 47.6 mm

.2 Joint Treatment Materials:

.1 Tape: 50.8mm spark perforated paper tape, of type recommended by manufacturer of gypsum board products.

.2 Jointing Compound: Casein, vinyl or latex base; slow setting; bedding and finishing compounds of type recommended by manufacturer of gypsum board.

.3 Water: Fresh, clean, potable, free from deleterious matter or alkalis.

.4 Glass mat Gypsum: Type as recommended by manufacturer of sheathing board.

2.4 ACCESSORIES

.1 Corner Beads: Min. 0.45mm (26 ga.) galvanized sheet steel; beaded angle with perforated flanges; flanges 28.6mm. Use extended leg bead at external corners at double wallboard application.

.2 Casing Beads: Min. 0.45mm (26 ga.) galvanized sheet steel; 'L' type or 'J' as required; beaded angle or casing with one side perforated for joint filling, suitable for 12.7 mm and 15.9mm gypsum board.

.3 Reveal joint: Commercially available extruded plastic reveal profile for 12mm joint.

3.0 EXECUTION

3.1 INSPECTION

.1 Examine site conditions and other underlying work for defects and/or discrepancies which might impair the work of this section.

.2 Ensure that bucks, anchors, blocking, electrical and mechanical work which is to be installed in or behind gypsum board has been installed and approved, prior to commencing gypsum board application.

3.2 WORKMANSHIP

.1 Application of gypsum wallboard shall comply with AWCC Specification Standards, Section 9.6, Part 3, manufacturer's instructions and as specified herein.

.2 Finished gypsum board surfaces shall be smooth, without undulations and true to lines and levels indicated on drawings, ready for decoration.

.3 Finished joint camber shall not exceed 1.6mm over 300mm joints.

3.3 GENERAL APPLICATION

.1 Drywall partition types are designated on the Drawings in accordance with wall types listed in Wall Construction Schedule. Fire resistance rated walls and ceilings (where applicable): Comply with requirements of testing agency for wall and ceiling systems detailed on drawings.

.2 Install partitions extending from floor to underside of concrete slab or structure over unless indicated and/or listed otherwise.

.3 Install gypsum board to avoid butt-end joints if possible to reduce the amount of joint finishing.

.4 Do not locate joints on same stud on opposite sides of partitions. Stagger end joints occurring on same side of partitions.

.5 Keep vertical joints at least 300mm from the jamb lines of door, window and other openings.

.6 Cut sheets to fit accurately; butt edges of boards in moderate contact; do not force into place. Remove ragged edges or burrs with rasp or sandpaper.

.7 Cut and fit of gypsum board to accommodate recessed items in partitions and/or furring.

.8 Allow deflection spaces between drywall partitions and building structural framing components to allow for movement of framing components.

.9 Level of Finish:
- .1 Ceiling space and unexposed plenums, duct shaft – level one.
- .2 Ceiling exposed to view – level four.
- .3 Wall exposed to view – level four.

3.4 SINGLE LAYER APPLICATION

.1 Erect gypsum board vertically or horizontally, whichever results in fewer end joints. Locate end joints over supporting members.

.2 Arrange end joints to occur on different studs on opposite sides of a partition. Keep end joints away from prominent locations and central portions of ceilings.

.3 Locate vertical joints at least 300mm from the jamb lines of openings.

.4 Drive screws with a power screw gun and set with countersunk head slightly below the surface of the gypsum wallboard. Ensure paper face of the gypsum wallboard is not broken by screws.

.5 Ensure perimeter screws are not less than 9.5mm nor more than 12mm from edges and ends and are opposite the screws on adjacent boards.

.6 Space screws for fire-rated gypsum board 200mm o.c. at gypsum board edges and 300mm o.c. on gypsum board field on walls, 200mm o.c. on all ceilings, unless otherwise required by ULC Design Test (or other approved test) assembly for fire rating specified.

.7 Space screws for other applications at 300mm o.c. on the field and edges.

.8 Apply by screw method to steel supports or by single nailing to wood supports, in accordance with requirements of Section 9.6 - Part 3, Item 6 of A.W.C.C. Standards, 6.2 for screw (steel stud and furring) application, or otherwise described with drywall laid up in vertical position.

3.5 DOUBLE LAYER APPLICATION

.1 Apply by screwing base and face layers in accordance with Clause 3.4 for single layer application, except the locations of joints in the two layers shall not coincide.

.2 Where double layer is required, install double layer to entire wall to provide flush wall with no reveals or recesses.

3.6 SHAFT WALL ERECTION

.1 At fire-rated shaft wall partitions, the methods of assembly and applying of gypsum coreboard and wallboard shall be according to the ULC fire test specimens to maintain fire and sound ratings.

.2 Both ends to be factory sawn for tight fit joint. All uneven joint to be covered with back blocking of shaftliner over the joint.

3.7 MOISTURE RESISTANT & EXTERIOR GYPSUM SHEATHING

.1 Install and fasten moisture resistant and exterior sheathing gypsum wallboard as indicated in strict accordance with manufacturer's recommendations.

3.8 METAL ACCESSORIES

.1 Corner Beads: Install to external corners using longest practical lengths. Fix at max. 150mm o.c. (alternate sides). Use screw fixing for applying external corner beads.

.2 Casing Beads & Miscellaneous Trim: Install to openings and wherever gypsum board abuts a dissimilar material, using longest practical lengths; secure at max. 300mm o.c.

3.9 GYPSUM BOARD FINISHING

.1 Tape, fill and sand field joints and internal angles using specified paper tape.

.2 For field joints, corners and exposed screws or nail heads, beads, mix joint filler and apply in strict accordance with the printed directions of the manufacturer and as follows:
First: Embed the tape.
Second: Apply leveling coat over tape.
Third: Apply skim (polish) coat.

.3 Sand exposed joints, edges, corners, openings, screws and other filled areas to provide a smooth surface ready for decoration.

.4 Tape and fill only joints in partitions carried above ceilings and where so scheduled.

.5 Rooms without base mould or trim: Finish gypsum board joints to floor slab.

3.10 ACOUSTICAL INSULATION

.1 Install acoustical insulation, as specified, between steel studs in sound insulated partitions according to wall schedules. Tightly fit insulation between studs and install full heights of partitions. Install wire ties to hold insulation in place where steel studs have wallboard one side only.

.2 Install acoustical insulation at sound isolated drywall ceilings as indicated.

3.11 INTERIOR SEALANT

.1 Seal joints between edge of single layer drywall (exposed joint) and exposed masonry walls or other adjoining vertical surfaces with sealant compound.

.2 Seal joints between edges of gypsum board to inside of exterior walls at adjoining vertical and horizontal surfaces and at penetrations to provide an effective air barrier in accordance with code requirements.

3.12 FIRESTOP SEALANT

.1 Seal joints at penetrations of fire-rated partitions and wall construction, joint between edge of first layer gypsum board and concrete or concrete block or double layer gypsum board wall construction and where detailed to provide and effective seal against the passage of fire, smoke and water by Section 07270 - Firestopping & Smoke Seals.

3.13 PATCHING & POINTING

.1 Point up and patch gypsum board; point up and around trim and other set work and leave work complete and perfect.

.2 Perform necessary patching and making good to sleeves, conduits, cutouts in gypsum board as required.

3.14 ADJUSTING & CLEANING

.1 Clean thoroughly and remove excess materials from other finished surfaces. Particularly protect and keep clean glass and aluminum work.

.2 Promptly remove excess and waste material as work proceeds particularly jointing compounds, and at completion of work.

END OF SECTION 09 29 00

1.0 GENERAL

1.1 DOCUMENTS

.1 This Section of the Specifications forms part of the Contract Documents and is to be read, interpreted and co-coordinated with all other parts.

1.2 SECTION INCLUDES

.1 Acoustical ceiling panels

.2 Exposed grid suspension system

.3 Wire hangers, fasteners, main runners, cross tees, and wall angle moldings.

.4 Seismic restraint to all existing t-bar ceiling within the tenant space.

1.3 RELATED SECTIONS

.1 Gypsum Board Section 09 29 00

1.4 REFERENCES

.1 AWCC (Association of Wall and Ceiling Contractors) Manual, Section 9.14, Acoustic Ceilings.

.2 ASTM C635, “Metal Suspension Systems for Acoustical Tile and Lay-In Panel Ceilings”.

.3 ASTM C636, “Installation of Metal Ceiling Suspension Systems for Acoustical Tile and Lay-In Panels”.

.4 ASTM A641M, “Specification for Zinc-Coated (Galvanized) Carbon Steel Wire”.

.5 ASTM E580, “Standard Practice for Installation of Ceiling Suspension Systems for Acoustical Tile and Lay-In Panels in Areas Subject to Earthquake Ground Motions”.

.6 ASTM E 1264, Classification for Acoustical Ceiling Products.

.7 CAN/CGSB 92.1, Sound Absorptive Prefabricated Acoustical Units.

.8 CSA B111-74(R2003), Wire Nails, Spikes and Staples.

.9 CAN/ULC-S102-[10)], Surface Burning Characteristics of Building Materials.

1.5 SUBMITTALS

.1 Submit samples in accordance with Section 01 33 00.

.2 Manufacturer’s Data: Submit 4 copies of manufacturer’s specifications and installation instructions for each acoustic ceiling system component required. Include reports and other data as may be required to show compliance with these specifications.

.3 Samples

.1 Submit one representative model of each type ceiling suspension system. Ceiling system to show basic construction and assembly, treatment at walls, recessed fixtures, splicing, interlocking, finishes, acoustical unit installation.

.2 Submit duplicate full size samples of each type acoustic ceiling panel.

.4 Shop drawings:

.1 Shop drawings and calculations shall be prepared under the supervision of a professional Engineer registered in B.C. The Engineer shall verify by sealing the shop drawings that the

drawings were prepared under the Design Engineer's supervision and that the Work of this Section meets the design and performance requirements of Vancouver Building Bylaw 2014. The Engineer shall submit Letter of Assurance along with signed sealed shop drawings and provide Model Schedule S-B and S-C on completion of the work. The Design Engineer shall satisfy himself that the manufacture and erection of the ceiling system is in accordance with his design and carry out periodic inspections of the fabrication and erection of the Work of this Section as he deems necessary.

.2 Shop drawings shall incorporate plans, sections and full size details for all work included in this Section. The full size details shall show detail profiles, die drawings, and specify all Products, Materials and finishes, provision for seismic restraint, all anchorage assemblies and components, provisions for adjustment, fabrication and erection tolerances for the work of this section and layout of all anchors.

.5 Maintenance Data: Submit for incorporation into maintenance manual complete instructions for the maintenance of ceiling materials installed in the work.

1.6 QUALITY ASSURANCE

.1 Execute all work of this section by approved and licensed workmen experienced in acoustic ceiling panel installations and in accordance with good trade practice.

.2 Conform to the requirement of the NBC for Class 25 (incombustible) Flame Spread Index according to Federal Specification SS-S-118a and have a Class 1 Flame Spread Rating according to ASTM E-84, for use in non-combustible construction for acoustic ceiling panels.

.3 Noise Reduction Coefficient (NRC), Light Reflectance Value, and Sound Transmission Class (STC) shall not be less than that listed in the "Acoustical and Board Products Association (ABPA) Bulletin", latest edition, for each tile specified, unless otherwise specified.

.4 All suspension anchoring devices and all seismic restraint Work shall be designed and certified by a Professional Engineer registered in BC, who shall carry out periodic site reviews during construction and at completion, submit reports and Letters of Assurance to the Client. Costs to be included in the Contract Price. Site reviews by the Design Engineer are supplementary to the Contractor's own primary quality control and supervisory procedures.

1.7 PRODUCT DELIVERY, STORAGE AND HANDLING

.1 Deliver acoustical panels and suspension system components to Project site in original, unopened packages and store them in a fully enclosed space. Protect against damage from moisture, direct sunlight, surface contamination, and other causes.

.2 Before installing acoustical panels, permit them to reach room temperature and stabilized moisture content.

.3 Handle acoustical panels carefully to avoid chipping edges or damaging units in any way.

1.8 SITE CONDITIONS

.1 Environmental Conditions:

.1 Ensure temperature of surrounding areas remains above 14°C (58°F) before, during, and after application and relative humidity is not in excess of 80%.

.2 Do not install acoustic ceiling assembly until building is enclosed, weatherproof, dust generating activities have terminated, overhead mechanical work completed, tested and approved, and painting finished.

.2 Protection:

.1 Protect work of this Section against damage by others.

.2 Protect work of other sections against damage, resulting from work of this Section.
.3 Repair and make good damage to approval of Consultant.

1.9 SCHEDULING
.1 Co-ordinate layout and installation of acoustical panels and suspension system components with other construction that penetrates ceilings or is supported by them, including but not limited to signage, light fixtures, HVAC equipment, fire-suppression system components, and partition assemblies.

2.0 PRODUCTS

2.1 CEILING PANELS
.1 Acoustic Panel:

.1	Surface Texture:	
.2	Composition:	Wet-formed Mineral Fiber
.3	Surface Finish:	Factory Applied Latex Paint
.4	Color:	White
.5	Size:	24in x 60in x 5/8in (610X1524X16 mm)
.6	Edge Profile:	Square Lay-in
.7	Noise Reduction Coefficient (NRC):	0.55
.8	Ceiling Attenuation Class (CAC):	min. 35
.9	Flame Spread:	CAN/ULC S102-10
.10	Light Reflectance (LR):	0.82
.11	VOC Formaldehyde:	Low
.12	Humid Resist:	Standard
.13	Anti-Microbial:	Standard
.14	Acceptable Product:	Armstrong Fissured Minaboard 762A or Cortega 772A

.2 The specified ceiling tiles are based building standards and no equivalent is accepted. Confirm with Building Superintendent before ordering

2.2 SUSPENSION SYSTEMS
.1 Materials:
.1 To ASTM C635, Intermediate Duty, capable of supporting ceiling assembly as shown on the drawings, or specified, with a maximum deflection of $^{1}/_{360}$th of the span, including mechanical and electrical components.
.2 Commercial quality cold rolled steel electro-galvanized coated and pre-painted.

.2 Finish: Low sheen baked enamel, satin sheen white colour.

.3 Suspension System: Non-fire rated, two directional exposed tee bar grid to ceiling pattern as shown. Components die cut. Main tee with double web, rectangular bulb and 24 mm. rolled cap on exposed face. Cross tee with rectangular bulb, web extended to form positive interlock with main tee webs, lower flange extended and offset to provide flush intersection.

.4 Accepted Products:
.1 PRELUDE $^{15}/_{16}$" Grid in white as manufactured by Armstrong to match base building standard.

3.0 EXECUTION

3.1 INSPECTION/PREPARATION
.1 Inspect the work of other Sections upon which the Work of this Section depends. Proceed only after deficiencies, if any, in the Work of other Sections have been corrected.

.2 Refer to Drawing schedules for types, locations of acoustic ceilings.

.3 Ensure all drop bulkheads are located and completed.

.4 Lay out grid system in accordance with reflected ceiling plans. Measure each ceiling area and establish the layout of acoustical panels to balance border widths at opposite edges of each ceiling. Avoid using less-than-half-width panels at borders, and conform to the layout indicated on reflected ceiling plans.

.5 Obtain data and dimensions from mechanical and electrical trades governing the exact location and suspension of ceiling fixtures and fittings.

3.2 INSTALLATION, APPLICATION, PERFORMANCE

.1 Suspension Systems:

.1 Install suspension systems in accordance with ASTM C636, manufacturer's directions and conforming to ceiling layout as shown on the drawings.

.2 Provide and install framing members and hangers of adequate strength to safely carry all loads. Do not hang on mechanical or electrical lines, ducts or services.

.3 Maximum deflection shall be $^{1}/_{360}$th of the span.

.4 Install wall and edge moldings where tile abuts walls and other vertical surfaces, and where necessary to conceal edges of acoustical panels.

.5 Install suspension system runners so they are square and securely interlocked with one another. Remove and replace dented, bent, or kinked members.

.6 Use laser equipment to lay out, align, and level the ceiling system.

.7 Center system on room axis leaving equal and greater than half border units or as indicated in Drawings.

.8 Install edge molding at intersection of ceiling and vertical surfaces, using longest practical lengths. Miter corners. Provide edge moldings at junctions with other interruptions.

.2 Panels:

.1 Ensure mechanical, electrical work and finished painting have been completed and inspected before installing panels.

.2 Neatly cut and fit acoustic panels to suspension system. Acoustic panels should be installed with undamaged edges.

.3 Make cutouts as required for fixtures.

.4 Install acoustical panels in ceiling suspension system.

.3 Suspension Systems - Seismic Restraint Requirements:

.1 Ensure suspension conforms to requirements of ASTM E580 and local building code.

.2 Wall angles or channels will have no special structural value assessed to themselves or method of attachment to walls.

.3 Main and across runners shall be attached to perimeter members on two adjacent walls; provide and maintain a clearance of 6.35 mm. between main/cross runners and perimeter members on the two remaining adjacent walls.

.4 Suspension Wire:

.1 Space suspension wires along each main runner in accordance with the load carrying capacity of the system using a minimum of 2.05 mm. (12 ga.) soft annealed galvanized steel wire.

.2 Attach each vertical wire to the ceiling suspension member with a minimum of three turns and to the structure above with a connection capable of carrying not less than 45.4 kg. allowable load; ensure points of hanger wire supports do not permit disengagement through vertical lifting.

.3 Ensure suspension wires do not hang more than one in six out of plumb unless counter sloping wires are provided.

.4 Design connection so wires do not attach to, or bend around interfering material, such as ducts; use a trapeze or equivalent device where obstructions preclude direct submission.

.5 Support the terminal ends of each cross runner or main runner independently, maximum 203 mm. from each wall with 2.05 (12 ga.) wire.

.6 Provide horizontal restraint by using four 2.05 mm. wires secured to the main runner within 51 mm. of the cross runner intersection and splayed 90 degrees from each other, at an angle not exceeding 45 degrees from the plane of the ceiling.

.7 Provide horizontal restraint points 3.7 m. o.c. in both directions, with the first point within 1.2 m. from each wall.

.8 Ensure attachment of the restraint wires to the structure above is adequate for the load imposed; horizontal restraint is not required for room sizes less than 37.2 m^2 where surrounding walls connect directly to the structure above; walls will provide the required restraint for room sizes less than 37.2 m^2.

3.3 ADJUSTING AND CLEANING

.1 Upon completion of the work, replace any defective or marked tile or suspension systems.

.2 Adjust and level suspension as required.

END OF SECTION 09 51 00

1.0 GENERAL

1.1 DOCUMENTS

.1 This Section of the Specifications forms part of the Contract Documents and is to be read, interpreted and coordinated with all other parts.

1.2 SECTION INCLUDES

.1 Sheet Linoleum

.2 Anti-Static Vinyl Tile

.3 Sports Rubber Flooring

.4 Resilient Base

1.3 RELATED SECTIONS

.1	Gypsum Board	Section 09 29 00
.2	Carpeting	Section 09 68 00

1.4 REFERENCES

.1 National Floor Covering Association (NFCA) Specification Manual.

.2 ASTM F1861 Standard Specification for Resilient Wall Base.

.3 ASTM F2034 Standard Specification for Sheet Linoleum Floor Covering.

.4 Fire: ASTM E648 – Class 1; Smoke: ASTM E662 – 450 or less, CAN/ULC S102.2-M88.

.5 ASTM F1344 Standard Specification for Rubber Floor Tile.

.6 ASTM F 1700-13, Standard Specification for Solid Vinyl Floor Tile.

.7 Electrical Overstress/Electrostatic Discharge Association (EOS/ESD):

.1 EOS/ESD-S7.1 1994 Floor Material Resistive Characterization of Materials.

1.5 QUALITY ASSURANCE

.1 Work to be in accordance with manufacturer's standard specifications and supervised by a certified installer whose work has been approved by the manufacturer of the materials used.

1.6 SUBMITTALS

.1 General: Submit for Consultant's review, in accordance with Section 01 33 00.

.2 Samples: Submit duplicate 300 x 300 mm sample pieces of each type of resilient sheet flooring, full size resilient tiles, 300 mm long base, 300 mm long welding rod.

.3 Submit product literature of Materials, together with the proposed ordering and delivery schedule for all such materials.

.4 Linoleum flooring must be ordered a minimum of sixty (60) days prior to start of scheduled installation.

.5 Shop Drawings:

.1 Show locations of seams, edges, columns, doorways, enclosing partitions, built-in furniture, cabinets, and cutouts.

.2 Show details of special patterns.

.6 Substrate Tests: Submit copies of moisture and alkalinity tests.

.7 Closeout Submittals:
- .1 Submit 4 copies of the following for incorporation into manual specified in Section 01 77 00 Closeout Procedures.
- .2 Maintenance and operations data includes – methods for maintaining installed products, and precautions against cleaning materials and methods detrimental to finishes and performance.
- .3 Warranty: Warranty documents specified herein.

.8 Flame Spread Certification: Submit manufacturer's certification that resilient flooring furnished for areas indicated to comply with required flame spread rating has been tested and meets or exceeds indicated standard.

.9 Replacement Material: After completion of work, deliver to project site and store where directed, replacement materials from same manufactured lot as materials installed, and as follows:
- .1 Sheet Flooring: 3m length x width of roll of sheet of each type, pattern and color installed. Identify each roll.
- .2 Resilient Base: Not less than 10 linear feet for each 500 linear feet or fraction thereof of each different type and color installed.
- .3 Resilient tile flooring: 10% extra materials of each colour, pattern, and type flooring materials. Clearly identify each container of tile flooring.
- .4 Adhesive: 10% extra materials of each type used. Identify each container.
- .5 All maintenance materials to be in one piece as packaged by the manufacturer.

1.7 WARRANTY

.1 Guarantee: Provide a written guarantee in a form acceptable to Owner, that the work of this Section is guaranteed against shrinking, stretching, creeping, lack of adhesion and failure due to defective products and/or workmanship, for a period of five (5) years from the date of Substantial Performance.

1.8 ENVIRONMENTAL CONDITIONS

.1 Maintain air temperature and structural base temperature at flooring installation areas above 20^{o}C for 72 hours before laying, during and 72 hours after installation.

.2 Moisture: Ensure substrate is within moisture limits and alkalinity limits prescribed by manufacturer.

1.9 PRODUCT DELIVERY, STORAGE AND HANDLING

.1 Deliver and store materials in original containers, with manufacturer's labels and seals intact, in a dry weatherproof building.

.2 Maintain storage room temperature 20 degrees Celsius minimum for 72 hours minimum prior to laying.

1.10 JOB CONDITIONS

.1 Inspect all surfaces prior to start of work and report any unsatisfactory conditions to the Consultant. Starting work shall imply acceptance.

.2 Do not commence installation until moisture tests have been conducted and conditions are found to be acceptable.

.3 Obtain instruction from Consultant before starting work, concerning directions of patterns and grains of resilient coverings.

.4 Consult other trades in advance and make provisions for work of other trades to avoid cutting and patching.

.5 Protect surrounding surfaces from soiling; make good defects.

2.0 PRODUCTS

2.1 MATERIALS

.1 Linoleum Sheet Flooring – LN

- .1 Linoleum Sheet flooring to ASTM F 2034 Standard Specification. Flooring with homogeneous layer of oxidized linseed oil and natural resins mixed with wood or cork flour and limestone.
- .2 Roll/Sheet Width: 6' 6" (2 m).
- .3 Wear layer/Overall thickness: 0.100" (2.5 mm)
- .4 ASTM D 2047, Standard Test Method for Static Coefficient of Friction of Polish-Coated Flooring of.06 or greater.
- .5 ASTM F 970, Standard Test Method for Static Load Limit – Passes at 150 PSI with less than .005" residual indentation.
- .6 ASTM E 648, Standard Test method for Critical Radiant Flux of 0.45 watts/cm2 or greater, Class I.
- .7 Contains 34% pre-consumer recycled content.
- .8 Contains 73% rapidly renewable content.
- .9 100% Recyclable
- .10 NSF-332 Platinum Certified
- .11 C2C Silver
- .12 95% USDA BioPreferred
- .13 Phthalate, Chlorine and Halogen-free
- .14 LEED contributions for Linoleum Sheet Flooring includes MR2; MR4; MR6 and EQ4.3.
- .15 SCS FloorScore® Certified and meets California Specifications Section 01250
- .16 Acceptable product and color: Harmonium XF2 Lenza by Johnsonite; Color – 305 Carbonize WG.

.2 Anti-Static Vinyl Tile – AVT

- .1 To ASTM F1700 Class I, Type A
- .2 Wear Layer Thickness: 2.0mm (0.080”)
- .3 Polyurethane Reinforced: Yes
- .4 Total Thickness: 2.0mm (0.080”)
- .5 Static Load Limit: ASTM F970 Passes
- .6 Electrostatic Resistance:
  - .1 ANSI/ESD S7.1 — 7.5 x 108, 12% RH, surface to ground
  - .2 OSHA/NFPA (> 2.5 X 104 ohms) — 6.2 x 107 ohms
  - .3 ASTM F 150 (50% RH, 100v) — 6.2 x 107 ohms
  - .4 ESD-approval (IEC 61340/100v) — 107
- .7 Resistance to Heat: ASTM F 1514 — $\Delta\sum \leq 8.0$
- .8 Resistance to Light: ASTM F 1515 — $\Delta\sum \leq 8.0$
- .9 Slip Resistance: ASTM D 2047 — SCOF ≥ 0.6
- .10 Flame Resistance: ASTM E 648 — Class 1
- .11 Chemical Resistance: ASTM F 925 — Good
- .12 Size: 610mm x 610mm nominal (24” x 24”)
- .13 Acceptable Product and Color: iQ Granit SD by Johnsonite; Color – 726 Sidewalk CG

.3 Sports Rubber Flooring – RF

- .1 Construction: Prefabricated resilient rubber athletic flooring, calendared and vulcanized with a base of natural and synthetic rubbers, stabilizing agents and

pigmentation. Product to be free of phthalate, halogen, heavy metal, formaldehyde, isocyanate and BPA.

.2 Thickness: 10mm.

.3 Surface Texture: Sealskin

.4 The shore hardness of the top layer to be greater than that of the bottom layer; shore hardness of layers to be recommended by the Manufacturer and the limits specified

.5 Size: 91.35cm x 91.35cm (36” x 36”)

.6 Acceptable product and color: Sport Impact by Mondo; Color – 154 Gold.

.4 Resilient Base – RB

.1 Resilient Base: To ASTM F1861, rubber, continuous length top set, bullnose top, cove toe

.2 Height: 100 mm

.3 Thickness: 3 mm

.4 Exterior Corners: Cut backside and fold

.5 Interior Corners: Mitre on site

.6 Exposed Ends: Round off corners on site. Provide in longest lengths possible. Joints to be at corners only where possible.

.7 Acceptable material: Johnsonite rubber base

.8 Color: #178 Ironstone CG

.5 Acc**e**ssories:

.1 Metal Schluter transition / reducing & edge strips tapered to meet abutting materials, colour as selected by Consultant.

.6 Primers and Levelers: Compatible types as recommended by flooring and adhesive manufacturers. Leveling and filler compound to be two-component type, consisting of liquid latex and dry-mixed filler, both supplied by same manufacturer.

.7 Adhesives: Waterproof type recommended by flooring manufacturer for the applicable conditions. Use special base adhesive.

.8 Sealer and Wax: Types recommended by resilient flooring manufacturer for material type and location and approved by Owner's Maintenance Department.

3.0 EXECUTION

3.1 INSPECTION

.1 Ensure concrete floors are smooth, dry and free from scale and other foreign matter likely to be detrimental to flooring.

.2 Take moisture and alkalinity tests. Use test method recommended by flooring manufacturer.

.3 Notify Consultant in writing of conditions that may effect finished flooring prior to start of work.

.4 Start of work implies acceptance of substrates.

3.2 PREPARATION

.1 Remove grease, dust and dirt remaining, fill cracks, holes, joints, with approved joint filler and rough grind to eliminate irregularities. Prohibit traffic until filler is cured and dry. Vacuum floor.

.2 Carry out any additional preparation or work as may be required, in order to ensure a satisfactory installation, including flush leveled between floor finish changes.

.3 Where required, prime surfaces with primers recommended by adhesives manufacturer.

3.3 INSTALLATION

.1 General:

.1 All primers, where recommended, shall be mandatory.

.2 Provide reference markers. Use chalk or other non-permanent marking devices.

.3 All tools and methods of application shall be strictly in accordance with the manufacturer's printed instruction, unless specified otherwise.

.4 Work shall be installed in accordance with approved manufacturer's standard specifications, supervised by a certified installer whose work has been approved by the manufacturer of the materials being used.

.5 At completion, all flooring shall be completely adhered to the substrate throughout and free of bumps caused by installation over improperly prepared substrate and/or loose particles covering the substrate.

.6 Work shall be subject to nominal inspection of the manufacturer's representative during and after installation.

.2 Sheet Flooring:

.1 Apply adhesive uniformly using recommended trowel. Do not spread more adhesive than can be covered by flooring before initial set takes place.

.2 Lay flooring to produce a minimum number of seams. Border widths minimum 1/3 width of full material.

.3 Double cut sheet joints and continuously seal. Heat weld seams according to manufacturer's printed instructions.

.4 As installation progresses, and after installation, roll flooring with 45 kg minimum roller to ensure full adhesion.

.5 Cut flooring neatly around fixed objects. Continue flooring over areas that will be under built-in furniture.

.6 Terminate flooring at interior of door in openings where adjacent floor finish or colour is dissimilar.

.7 Install edge strips at unprotected or exposed edges where flooring terminates.

.8 Install continuous bead of clear silicone sealant at joint where flooring terminates against walls prior to installing rubber base.

.9 Install flooring to pattern and direction as directed by consultant. Distribute variation in shade of pattern of production run to obtain uniform effect. Abrupt variations will not be permitted.

.10 Caulk joint between flooring and steel floor plates, door frames, window frames and other similar conditions.

.11 Without damaging surfaces, remove any excess adhesive from the flooring and wall surfaces as the work proceeds.

.3 Base:

.1 Apply to walls in continuous full lengths, using special base adhesive, with top uniform and level, to variation of 1:1000, and bottom of base uniformly tight to flooring with no gaps.

.2 Use pre-molded units at all external corners, with mitre cut internal corners.

.3 Joints to be plain, tight butt, inconspicuously placed where possible.

.4 Use 3 kg hand rollers to ensure base is firmly embedded in adhesive.

.5 Accurately scribe to frames, fitments and other obstructions.

.6 Install base on walls, columns, cabinets and fitments of rooms where base is scheduled or shown.

.7 Install toeless type at carpeted areas.

.4 Edge Strip:

.1 Apply edge strip at exposed edges of resilient flooring.

3.4 CLEANING AND WAXING

.1 Remove excess adhesive from floor, base and other surfaces without damage.

.2 Clean, seal and wax floor and base surfaces to flooring manufacturer's printed instructions.

3.5 PROTECTION

.1 Do not allow loads or traffic on flooring for at least 48 hours after installation.

.2 Do not flood with water for at least two (2) weeks after installation.

.3 Protect installed flooring in a manner recommended by flooring manufacturer against damage from rolling loads, the work of other trades, and including the placement of fixtures and furnishings.

.4 Provide manufacturer-recommended regular maintenance, until the date of Substantial Performance.

END OF SECTION 09 65 00

1.0 GENERAL

1.1 DOCUMENTS

.1 This Section of the Specifications forms part of the Contract Documents and is to be read, interpreted and coordinated with all other parts.

1.2 SECTION INCLUDES

.1 Epoxy floor and integral cove base coatings.

1.3 RELATED SECTIONS

.1	Finish Carpentry	Section 06 20 00
.2	Architectural Woodwork	Section 06 40 00
.3	Gypsum Board	Section 09 29 00
.4	Resilient Flooring	Section 09 65 00
.5	Epoxy Coating	Section 09 96 56

1.4 QUALITY ASSURANCE

.1 Work to be in accordance with manufacturer's standard specifications and supervised by a certified installer whose work has been approved by the manufacturer of the materials used.

1.5 SUBMITTALS

.1 General: Submit for Consultant's review, in accordance with Section 01 33 00.

.2 Samples: Submit duplicate 12" x 12" sample with 4" base return at vertical surface of each colour and material being applied, with texture to simulate actual conditions for Consultant's review. Submit 2 textures for selection by consultant. Use representative colours when preparing samples for review; resubmit until required sheen, colour, and texture are achieved. Obtain written acceptance of Samples in writing from the Consultant before commencing Work of this Section. Accepted Samples shall be the final standard of acceptance of the finish.

.3 Product Data: Submit manufacturer's technical data, product data (including physical properties and appearance options including: standard colours, variable surface textures and surface sheen),installation instructions, and general recommendations for each flooring material. Include certification indicating compliance of materials with requirements.

.4 Maintenance Data: Submit manufacturer's printed maintenance instructions for repair, cleaning and maintenance procedures; include name of original installer and contact information for incorporation into Operation and Maintenance Manual.

.5 Substrate Tests: Submit copies of moisture and alkalinity tests.

.6 Guarantee: Provide a written guarantee in a form acceptable to Owner, that the work of this Section is guaranteed against shrinking, stretching, creeping, lack of adhesion and failure due to defective products and/or workmanship, for a period of five (5) years from the date of Substantial Performance.

1.6 QUALITY ASSURANCE

.1 Installer Qualifications: Engage an Installer who has successfully completed within the last 3 years at least 3 flooring applications similar in type and size to that of this project and who will

assign mechanics from these earlier applications to this project, of which one will serve as lead mechanic.

.1 Installers must have completed flooring manufacturer's training program for Products specified.

.2 Installers must be licensed, certified or approved in writing by the flooring manufacturer for the Products specified.

.2 Provide mock up for review by consultant.

1.7 ENVIRONMENTAL CONDITIONS

.1 Do not install the Work of this Section outside of the following environmental ranges without Manufacturers' written acceptance:

.1 Material Temperature: Precondition material for at least 24 hours between 18°C and 30°C (65°F and 86°F).

.2 Ambient and Substrate Temperature: Minimum/Maximum 10˚/30˚C (50˚/86˚F).

.3 Substrate temperature must be at least 3˚C (5˚F) above measured Dew Point.

.4 Mixing and Application attempted at Material, Ambient and/or Substrate Temperature conditions less than 18˚C (65˚F) will result in a decrease in Product workability and slower cure rates.

.5 Relative Ambient Humidity: maximum ambient humidity 85% (during application and curing).

.6 Measure and confirm acceptable test results for Ambient Relative Humidity, Ambient and Surface Temperature and Dew Point.

.2 Substrate Moisture:

.1 Moisture content of concrete substrate must be ≤ 4% by mass as measured with a Tramex® CME/CMExpert type concrete moisture meter.

.2 Additionally, internal concrete relative humidity tests may be conducted as per ASTM F2170 and values must be ≤ 85%.

.3 If moisture content of concrete substrate is higher than 4% by mass and / or if relative humidity test results exceed readings of 85% RH, Consultant will instruct on addition of moisture mitigation systems or moisture tolerant primers.

.3 Supply temporary utilities, including power, water, temporary ventilation and lighting for use by applicator.

.4 Maintain constant ambient room temperature for 48 hours before, during and after installation or until cured. Minimum temperature of 10°C (50°F) and maximum temperature of 30°C (85°F). Do not apply Product while ambient and substrate temperatures are rising.

.5 Erect suitable barriers and post legible signs at points of entry to prevent traffic and trades from entering the work area during application and curing period of the floor.

.6 Ensure adequate ventilation and air flow.

.7 Advise other trades of fixtures and fittings not to be installed until floor is cured, such as: radiators, painting, decorating, floor-supported equipment or cabinetwork, caulking, plumbing, fixtures, etc.

.8 Protect adjacent surfaces from damage resulting from work of this trade. If necessary, mask and/or cover adjacent surfaces, fixtures, equipment, etc. by suitable means.

1.8 DELIVERY, STORAGE AND HANDLING

.1 Delivery:

.1 Deliver materials to site in manufacturer's original, unopened containers and packaging, with labels clearly identifying product name, manufacturer, batch or lot number, and date of manufacture.
.2 Material should be delivered to job site and checked for completeness and shipping damage prior to job start.

.2 Storage:
.1 Store materials in accordance with manufacturer's instructions.
.2 Keep containers sealed until ready for use. Material should be stored in a dry, enclosed, protected area from the elements.
.3 Do not subject material to excessive heat or freezing.
.4 Shelf life: Established based on manufacturer's written recommendation for each material being used.

.3 Handling:
.1 Protect materials during handling and application to prevent damage or contamination.
.2 Condition materials for use accordingly to manufacturer's written instructions prior to application.
.3 Record material lot numbers and quantities delivered to jobsite/storage.

2.0 PRODUCTS

2.1 MATERIALS

.1 Cementitious mortar, for building up slope for slope to drain.

.2 Resinous Flooring System: double broadcast and sealed decorative epoxy floor and integral cove base composed of multi-coloured quartz aggregates finished with transparent top coats and as follows:
.1 Compressive Strength: 51.8 MPa (7,511 psi) at 28 days in accordance with ASTM C579.
.2 Flexural Strength: 15.9 MPa (2,306 psi) at 28 days in accordance with ASTM C580.
.3 Hardness: 85 Shore D at 7 days in accordance with ASTM D2240.
.4 VOC Content: ≤ 25 g/L in accordance with ASTM D2369.
.5 Pull-off Strength: > 4.2 MPa (>609 psi) with substrate failure in accordance with ASTM D4541.
.6 Flammability: Self-extinguishing in accordance with ASTM D635.
.7 System Thickness: minimum 3 mm (1/8")
.8 Approved Product and Manufacturer: Sikafloor Quartzite Broadcast System by Sika
.9 Color & Texture: Blend 110
.10 Finish: Semi-gloss satin top coat
.11 Location: Washroom/Shower, refer to drawings.

.3 Components:
.1 Primer and Broadcast Coats: two component, clear, high solids, low odour, low VOC, high gloss epoxy finish.
.1 Applied Thickness:
.1 Prime Coat: 254 µm (10 mils) w.f.t.
.2 1st Broadcast Coat: 381 µm (15 mils) w.f.t.
.3 2nd Broadcast Coat: 508 µm (20 mils) w.f.t.
.2 Compressive Strength: 51.8 MPa (7511 psi) in accordance with ASTM C579.
.3 Tensile Strength: 9.2 MPa (1,334 psi) in accordance with ASTM C307.
.4 Pull-off Strength: >4.2 MPa (>609 psi) on concrete in accordance with ASTM D4541.
.5 Hardness: 85 Shore D in accordance with ASTM D2240.
.6 VOC Content: 1 g/L in accordance with ASTM D2369.
.7 Basis-of-Design Product: Sika Canada Inc., Sikafloor Duochem 9205.

.2 Decorative Broadcast Quartz Aggregates: finished with transparent top coats.

.3 Top Coat: two component, high solids, low odour, low VOC, high strength, high gloss, clear epoxy resin formulated for improved resistance to clarity change over time.
- .1 Applied Thickness: to achieve floor and base thickness as listed below.
- .2 Compressive Strength: 70 MPa (10,521 p.s.i.) in accordance with ASTM C579.
- .3 Tensile Strength: 28 MPa (4,061 p.s.i.) in accordance with ASTM D638.
- .4 Flexural Strength: 83 MPa (12,038 p.s.i.) in accordance with ASTM C580.
- .5 VOC Content: ≤ 25 g/L in accordance with ASTM D2369.
- .6 Modulus of Elasticity: 1287 MPa (186,663 p.s.i.) in accordance with ASTM C580.
- .7 Elongation: 4% in accordance with ASTM D638.
- .8 Hardness: 85 Shore D in accordance with ASTM D2240.
- .9 Resistance to Mold Growth: Rated 0 (no growth) in accordance with ASTM D3273.
- .10 Resistance to Fungi Growth: Rated 10 (highest resistance) in accordance with ASTM G21.
- .11 Flammability: Self-extinguishing in accordance with ASTM D635.
- .12 Basis-of-Design Product: Sika Canada Inc., Sikafloor 2002.

.4 Semi-Gloss Top Coat: two component, low odour, VOC compliant, water-borne, non-yellowing acrylic-aliphatic polyurethane semi-gloss-finish top coat:
- .1 VOC Content: ≤ 35 g/L in accordance with ASTM D2369.
- .2 Abrasion Resistance: 0.073 g in accordance with ASTM D4060 (CS17/1000cycles/1000g).
- .3 Basis-of-Design Product: Sika Canada Inc., Sikafloor 318.

.5 Epoxy Cove Mortar: three-component, solid colour, low odour, low VOC, vertical grade coving and detailing mortar with primer.
- .1 Compressive Strength: 41 MPa (5946 psi) at 28 days in accordance with ASTM D695.
- .2 Tensile Strength: 36 MPa (5221 psi) at 28 days in accordance with ASTM D638.
- .3 Hardness: 83 Shore D in accordance with ASTM D2240.
- .4 VOC Content: ≤ 5 g/L in accordance with ASTM D2369.
- .5 Pull-off Strength: > 1.7 MPa (246 psi) with 100% substrate failure in accordance with ASTM D4541.
- .6 Basis-of-Design Product: Sika Canada Inc., Sikafloor Morritex Epoxy Cove Mortar.

.6 Accessories: Provide all cleaning agents, cleaning cloths, sanding materials, and clean-up materials required per manufacturer's specifications.

.4 Waterproofing
- .1 Laticrete anti-fracture waterproof membrane for whole washroom/shower room #610, with minimum upstand of 150mm, in washroom area, and full height of shower area.

.5 Floor thickness: minimum 4.7625mm (3/16") at low point, slope to drain.

.6 Integral cove base thickness: minimum 9.525mm (3/8"), base height: 150 mm.

.7 Stainless steel cap strip between epoxy base and FRL wall panels where applicable.

3.0 EXECUTION

3.1 INSPECTION

.1 Ensure concrete floors are smooth, dry and free from grease, wax, oil, dirt, scale and other foreign matter likely to be detrimental to flooring.

.2 Take moisture and alkalinity tests. Use test method recommended by flooring manufacturer.

.3 Notify Consultant in writing of conditions that may affect finished flooring prior to start of work.

.4 Start of work implies acceptance of substrates.

3.2 SURFACE PREPARATION

.1 Remove grease, dust and dirt remaining, fill cracks, holes, joints, with approved joint filler and rough grind to eliminate irregularities. Prohibit traffic until filler is cured and dry.

.2 Carry out any additional preparation or work as may be required including levelling, in order to ensure a satisfactory installation.

.3 Where required, prime surfaces with primers recommended by adhesives manufacturer.

3.3 MIXING

.1 Comply with manufacturer's instructions for mixing procedures.

.2 Pre-mix each component before every batch to ensure uniformity.

.3 Carefully measure and mix the components together.

3.4 INSTALLATION

.1 Generally:

.1 Follow manufacturer's written instructions.

.2 Apply cementitious mortar according to slope on drawing and in accordance with manufacturer’s instructions.

.3 Install integral cove base in accordance with manufacturer's instructions.

.4 Prime entire surface with recommended primer.

.5 Apply epoxy and aggregate matrix in accordance with manufacturer's instruction to a total thickness of 3/16 inch (4.8 mm) to 1/4 inch (6.4 mm). Apply body coat of resin using roller, squeegee, or trowel. Broadcast pre-mixed grains to saturation.

.6 Apply grout coat(s) and topcoat(s) at manufacturer's recommended coverage to provide uniform, dense surface.

.7 Allow proper cure time for each installation step.

.8 Allow the finished epoxy flooring to cure for a minimum of 7 days from completion before putting into service.

.9 If necessary, use temporary protection until flooring is fully cured.

.2 Base:

.1 Carry epoxy coating up sides of walls to a height as shown on drawing above finished floor surface.

.2 Make top uniform and level, to variation of 1:1000.

.3 Provide 40 mm radius coved epoxy floor base at junctions between base and floor.

.4 Provide coved epoxy at top of base to cover wall coating where applicable.

.5 Install base on walls of rooms where base is scheduled or shown.

.3 Waterproofing

.1 Install waterproofing to minimum of 150mm (6”) high above finished floor in washroom area and full height in shower area.

3.5 CLEANING AND WAXING

.1 Clean floor and base surfaces to flooring manufacturer’s printed instructions.

3.6 PROTECTION

.1 Protect finished floor from damage by subsequent trades.

.2 Do not allow light foot traffic on flooring for at least 24 hours after installation.

.3 Do not allow rubber-wheel traffic for at least 72 hours after installation.

.4 Do not immerse or expose to chemical for at least 7 days after installation.

.5 Follow manufacturer's written recommendations with respect to cure, wait time and return to service.

END OF SECTION 09 67 23

1.0 GENERAL

1.1 DOCUMENTS

.1 This Section of the Specifications forms part of the Contract Documents and is to be read, interpreted and coordinated with all other parts.

1.2 SECTION INCLUDES

.1 Supply and install carpeting.

1.3 RELATED SECTIONS

.1	Resilient Flooring	Section 09 65 00
.2	Resinous Flooring	Section 09 67 23

1.4 REFERENCES

.1 CGSB 4-GP-129+Corr & Amend - Carpets Commercial.

.2 CGSB 4-GP-156 Direct Glue - Down Carpet - Installation.

.3 CAN4 S102.2-M80 Flame Spread

.4 CGSB 4-GP-155M Flammability

.5 Specification Standards Manual as published by the National Floor Covering Association.

1.5 QUALITY ASSURANCE

.1 Work to be performed by qualified, skilled layers with five (5) years minimum experience in this type of Work and under the direct supervision of a responsible and experienced foreman.

1.6 SUBMITTALS

.1 Samples: Submit duplicate full size pieces of specified materials, for each colour selected and provide samples of accessories in accordance with Section 01 33 00.

.2 Shop drawing: Submit shop drawing showing installation pattern and direction.

.3 Product Data: Submit manufacturer's data verifying compliance with this specification section

Submit evidence acceptable to Fire Marshall verifying compliance with:

.1 Flame resistance to CGSB 4-GP-129 as conforming to Hazardous Products Act, Carpet Regulations.

.2 ULC flame spread and smoke developed classification by ULC listing or test report certified by nationally recognized fire test Laboratory.
Submit certifications in accordance with Section 01 33 00.

.4 Maintenance Materials: Provide 2% minimum of floor area carpeted for each colour used for future maintenance. Identify all materials. Store where directed.
Maintenance materials to be in the same production run as installed materials.

.5 Maintenance Data: Provide maintenance data for carpet.

.6 Guarantee: Provide a written guarantee that work of this Section is guaranteed against deterioration and failure of material and workmanship detrimental to appearance and performance under normal traffic conditions, for a period of ten (10) years, and that all defects will be made good, without cost to Owner.

In addition provide manufacturer's guarantee to cover defects in carpet material for ten (10) years against unraveling, colour fading and deterioration of backing materials.

1.7 PRODUCT DELIVERY, STORAGE AND HANDLING

.1 Deliver and store materials in original containers with manufacturers' seals and labels intact.

.2 Prevent damage to materials during handling and storage. Keep materials under cover and free from dampness.

.3 Store materials in area of installation for minimum period of 48 hours prior to installation.

.4 Store carpet and adhesive at minimum temperature of 21°C and relative humidity of maximum 65% for minimum of 72 hours before installation.

1.8 WASTE MANAGEMENT AND DISPOSAL

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

.2 Remove from site and dispose of packaging materials at appropriate recycling facilities.

.3 Collect and separate for disposal packaging material for recycling in accordance with Waste Management Plan.

.4 Vacuum used carpet before removal.

.5 Maintain possession of removed used carpet.

.6 Sort only clean, dry carpet materials for reclamation. Clean is defined as carpet free from demolition debris, asbestos contamination, garbage and tack strips.

.7 Immediately remove used carpet from site and transport to reclamation point.

1.9 PROTECTION

.1 Protect carpeting materials at the place of building, using original wrappings or heavy duty polyethylene sheets.

.2 Upon completion of work, cover traffic areas with heavy duty polyethylene walk sheets.

.3 Protect existing work from damage; make good Work damaged at no additional cost to the Owner.

1.10 ENVIRONMENTAL CONDITIONS

.1 Temperature: Maintain ambient temperature 20 degrees C. minimum for 72 hours before and after, and during installation.

.2 Lighting: Provide 161 cd/m^2 (15c/ft^2) minimum at surface.

.3 Relative humidity: Maintain relative humidity between 10 and 65% RH for 72 hours before, during and 72 hours after installation.

.4 Safety: Comply with requirements of Workplace Hazardous Materials Information System (WHMIS) regarding use, handling, storage, and disposal of hazardous materials.

.5 Ventilation: Provide adequate controlled ventilation during and after installation.

.6 Do not install carpet until space is enclosed and weatherproof, wet-work in space is completed and nominally dry, and work above ceilings is complete.

2.0 PRODUCTS

2.1 MATERIALS

.1 General: Materials of first quality, no seconds or substandards, colours continuous throughout thickness of yarn.
Ensure carpet conforms to CGSB 4-GP-129+ Corr & Amend except as noted, and CGSB 4-GP-155M (flammability).

.2 Carpet Tile: CPT

.1	Product Construction:	Tufted Textured Loop
.2	Yarn System:	Post-Consumer Content Type 6,6 Nylon
.3	Yarn Manufacturer:	Universal or equivalent
.4	Dye Method:	100% Solution Dyed
.5	Soil/Stain Protection:	Protekt² or equivalent
.6	Preservative Protection:	Intersept or equivalent
.7	Tufted Yarn Weight:	475 g/m² (14 oz/yd²)
.8	Machine Gauge:	47.2 ends/10cm (1/12 in)
.9	Pile Height:	3.3 mm (0.13 in)
.10	Pile Thickness:	1.7 mm (0.068 in)
.11	Stitches:	30.7 ends/10cm (7.8 /in)
.12	Pile Density:	274,835.3 g/m³ (7,412 oz/yd³)
.13	Size:	25cm x 1m (9.845 in x 39.38 in)
.14	Acceptable Product & Color:	Bike Path BP411 by Interface; Color – Coin/Yellow 104659
.15	Installation Pattern:	Ashlar
.16	Installation Method:	TacTiles

.3 Metal Edge Strips:
- .1 Hammered surface aluminum installed.
- .2 Floor flange minimum 38 mm wide, face minimum 16 mm wide.
- .3 Finish: clear anodic coating.

.4 Metal transition / reducing strips tapered to meet abutting materials.

.5 Carpet protection: non-staining heavy duty kraft paper or 0.152 mm thick polyethylene film.

.6 TacTiles, tapes and other accessories as recommended by carpet manufacturer.

.7 Patching/Filler/Leveling Compound: Two components consisting of liquid latex and dry, premixed filler, both supplied by same manufacturer. Use Mapei-Plani/Patch or other cementitous underlay to approval of the Consultant.

3.0 EXECUTION

3.1 SURFACE CONDITION

.1 Inspect substrate prior to start of work, ensure that surfaces are sound, cured, non-dusting, smooth and free from defects likely to be detrimental to the work.

.2 Cure concrete floors 28 days minimum.

.3 Notify Consultant in writing of all defects likely to impair finished work. Start of work implies acceptance of surfaces and conditions.

3.2 PREPARATION

.1 Remove grease, dirt, and dust remaining, fill cracks, holes, and joints with approved joint filler and rough grind to eliminate irregularities. Sweep and vacuum substrate clean.

.2 Ensure that carpet base has been installed prior to laying carpet.

.3 At all locations which receive flooring, verify condition of sub-floor and determine if the floor is level, and before installation of flooring, spread underlayment where required to provide level floors. Carpet to have flush leveled transition between other floor finishes.

3.3 INSTALLATION

.1 All primers, where recommended, shall be mandatory.

.2 All tools and methods of application shall be strictly in accordance with the requirements of the NFCA Manual, in accordance with manufacturer's written instructions and recommendations, and as modified herein.

.3 Work shall be installed in accordance with approved manufacturer's standard specifications, supervised by a certified installer whose work has been approved by the manufacturer of the materials being used.

.4 Install carpeting using "TacTiles" in strict accordance with manufacturer's written instructions.

.5 Install carpet smooth and free of bubbles, puckers, and other defects.

.6 Use materials from same dye lot. Ensure colour, pattern and texture match within any one visual area. Maintain constant pile direction.

.7 Confirm lay-up pattern with Consultant before commencing any installation. Layout the work in accordance with the drawings and specifications. Install the carpet to pattern and direction, as directed by the Consultant.

.8 Install only after other trades and finish work is completed, and fitments, telephone and electrical pedestal outlets are installed.

.9 Distribute variation in shade of pattern of production run to obtain uniform effect. Abrupt variations will not be permitted.

.10 Do cutting and fitting as required. Cut and fit neatly into recesses and breaks around columns, heating elements, piping, outlets and other projections through floor. Fill in strips not less than 450 mm x 900 mm.

.11 Seal finish edges of cut-outs and finish with positive binding methods to produce a 'trim free' finish.

.12 During stretching and laying operations, continually roll seams using a steel segmented roller weighing 45 kg (100 lbs.) minimum and ensure that seams lie perfectly flat.

.13 Butt edges of carpet to form a seam-free appearance, in strict accordance with recommended trade practice.

.14 Lay wall to wall square with room axis unless otherwise shown or directed, with metal edge strip at exposed edges.

.15 Lay carpet evenly over the entire area, to ensure a perfectly smooth installation, free from burring, seam separation, puckers and crooked seams, distortions of pattern and/or weave, uneven tension and other detrimental defects.

.16 Extend carpet into toe spaces, door reveals, closets, open-bottomed obstructions, removable flanges, alcoves, and similar openings.

.17 Terminate flooring at interior of door in openings where adjacent floor finish or color is dissimilar.

3.4 FIELD QUALITY CONTROL

.1 Carpet manufacturer's representative: Visit the site before application to ensure subfloor is properly prepared. Inspect rolls as they are opened to confirm carpet is as specified. Visit the site from time to time to review installation. Examine installation prior to final acceptance and report to the consultant any defects which would affect the performance of the carpet installation.

3.5 ADJUSTING AND CLEANING

.1 Immediately after installation remove all trimmings, clippings and other excess material from the place of building.

.2 Remove spots from carpet surface with and approved spot remover, and thoroughly vacuum the carpet and leave clean and perfect.

.3 Protect traffic areas of carpeted floors with carpet protection.

END OF SECTION 09 68 00

1.0 GENERAL

1.1 DOCUMENTS

.1 This Section of the Specifications forms part of the Contract Documents and is to be read, interpreted and coordinated with all other parts.

1.2 SECTION INCLUDES

.1 Magnetic dry erase wallcovering and accessories.

1.3 RELATED REQUIREMENTS

.1 Rough Carpentry Section 06 10 00

.2 Gypsum Board Section 09 29 00

1.4 REFERENCES

.1 American Society for Testing and Materials (ASTM):
E84 Test Method for Surface Burning Characteristics of Building Materials.

.2 Gypsum Association GA-214-M-97 Recommended Levels of Gypsum Board Finish.

1.5 SUBMITTALS

.1 Manufacturer's product submittals data and installation instructions for each type of dry erase wallcovering, adhesive, and accessories required.

.2 Manufacturer's written product data indicating compliance with specified materials required.

.3 Manufacturer's written installation instructions.

.4 Manufacturer's written instructions for recommended maintenance of each type of dry erase wall covering required.

.5 Samples:

.1 177.8mm (7 inch) x 228.6mm (9 inch) samples of each dry erase material required.

.2 152.4mm (6 inch) samples of trim, tray, and end caps required.

1.6 QUALITY ASSURANCE

.1 Manufacturer: Provide each type of dry erase wallcovering required produced by one manufacturer.

.2 Installer: Installation by skilled commercial wallcovering contractor with no less than three years of documented experience installing dry erase wallcovering of the type and extent required.

.3 Composition: Provide scrim backed, ferrous powder vinyl bonded with white pigmented vinyl and capped with moderate gloss, dry erase film.

.4 Surface Burning Characteristics Classification: Provide materials that meet Class I/A rating when tested in accordance with ASTM E84 for flame spread and smoke developed.

.5 Field Samples: Prepare field samples for architect's review and establish requirements for seaming and finish trim.

.1 Install sample panel of each type presentation wallcovering specified in area designated by Consultant.

.2 Maintain corrected and approved samples to serve as a standard of performance for the project.

1.7 PRODUCT DELIVERY, STORAGE AND HANDLING

.1 Deliver presentation wallcoverings to the project site in unbroken and undamaged original factory packaging and clearly labeled with the manufacturer's identification label, quality or grade, and lot number.

.2 Store materials in a clean, dry storage area with temperature maintained above 13°C (55°F) with normal humidity.

.3 Store material within original packaging to prevent damage.

1.8 PROJECT CONDITIONS

.1 Do not apply presentation wallcoverings when surface and ambient temperatures are outside the temperature ranges required by the wallcovering manufacturer.

.2 Provide continuous ventilation and heating facilities to maintain substrate surface and ambient temperatures above 13°C (55°F) unless required otherwise by manufacturer's instructions.

.3 Apply adhesive when substrate surface temperature and ambient temperature is above 13°C (55°F) and relative humidity is below forty percent.

.4 Maintain constant recommended temperature and humidity for at least 72 hours prior to and throughout the installation period, and for 72 hours after wallcovering installation completion.

.5 Provide not less than 80-foot-candles per square foot lighting level measured mid-height at substrate surfaces.

1.9 WARRANTY

.1 Submit manufacturer's limited five-year written warranty against manufacturing defects.

1.10 MAINTENANCE

.1 Maintenance instructions: Include precautions against cleaning materials and methods that may be detrimental to finishes and performance.

2.0 PRODUCTS

2.1 MATERIALS

.1 Magnetic receptive, moderate gloss, vinyl surface for dry erase markers.
- .1 1.19/1.22m (47/48 inch) width, scrim backing.
- .2 Acceptable manufacturer and product: Mag-rite II M248 by Walltalkers.

2.2 ACCESSORIES

.1 Aluminum Tray: Clear satin, anodized aluminum, snap-on marker and eraser tray with Clips. Length to match width of dry-erase wallcovering installed.

.2 End Caps: 13mm (1/2 inch) anodized tray end cap set for marker and eraser tray.

.3 J Cap Wallcovering Trim: Clear satin, anodized aluminum, low profile trim.

.4 Adhesives: Heavy-duty clear or clay based premixed vinyl adhesive.

.5 Substrate Primer/Sealer: White pigmented acrylic base primer/sealer specifically formulated for use with vinyl wallcoverings.

.6 Starter Kit: Provide one regular starter kit with standard dry erase markers.

.7 Eraser:
- .1 Dry erase felt eraser
- .2 Dry erase cleaning cloth – yellow.

.8 Liquid Surface Cleaner:
- .1 0.23kg (8 ounce) bottle liquid surface cleaner.

.9 Magnets:
- .1 Heavy duty magnet – black.
- .2 Total 30 nos.

3.0 EXECUTION

3.1 EXAMINATION

.1 Examine substrates and installation conditions to ensure surface conditions meet or exceed a Level 4 finish, per GA-214-M-97: Recommended Levels of Gypsum Board Finish, and permanent lighting should be installed and operational.

.2 Test substrate with suitable moisture meter and verify that moisture content does not exceed four percent.

.3 Verify substrate surface is clean, dry, smooth, structurally sound and free from surface defects and imperfections that would show through the finished surface.

.4 Evaluate all painted surfaces for the possibility of pigment bleed-through.

.5 Notify the contractor and Departmental Representative in writing of any conditions detrimental to the proper and timely completion of the installation.

.6 Beginning of installation means acceptance of surface conditions.

3.2 INSTALLATION – WALLCOVERING BACKING

.1 Acclimate wallcovering in the area of installation a minimum of 24 hours before installation.

.2 Read and follow the manufacturer’s installation instruction sheet contained in each roll of the dry erase wallcovering.

.3 Examine all materials for pattern, color, quantity and quality, as specified for the correct location prior to cutting.

.4 Primer: Use a quality pigmented acrylic wallcovering primer.

.5 Adhesive: Apply a uniform coat of heavy-duty pre-mixed clay-based or extra strength clear wallcovering adhesive.

.6 Install each strip horizontally and in the same sequence as cut from the roll.

.7 Install dry erase wallcovering sheets in exact order as they are cut from bolt. Reverse hang alternate strips (except lined products). Do not crease or bend the wallcovering when handling.

.8 Install dry erase wallcovering horizontally using a level line.

.9 Using a level or straight edge, double cut the seam with a seam-cutting tool (Ex: Double Seam-Cutter or Swedish Knife). Do not score drywall or plasterboard when cutting material.

.10 When covering the entire wall, seam the material out of the main writing and viewing areas of the wall.

.11 Apply wallcovering to the substrate using a wallcovering smoother, wrapped with a soft cloth, to remove air bubbles. Do not use sharp edged smoothing tools. Smooth material on the wall from the middle to the outside edge.

.12 Remove excess adhesive immediately after the wallcovering is applied. Clean entire surface with a warm mild soap solution, and clean soft cloths. Rinse thoroughly with water and let dry before using. Change water often to maintain water clarity.

.13 Stop installation of material that is questionable in appearance and notify the manufacturer's representative for an inspection.

3.3 CLEAN-UP

.1 Upon completion of installation, remove all exposed adhesive immediately using a soft cloth and a warm, mild soap solution and rinse thoroughly with water and dry with clean towel prior to using.

.2 Upon completion of the work, remove surplus materials, rubbish, and debris resulting from the wallcovering installation. Leave areas in neat, clean, and orderly condition.

END OF SECTION 09 72 00

1.0 GENERAL

1.1 DOCUMENTS

.1 This Section of the Specifications forms part of the Contract Documents and is to be read, interpreted and coordinated with all other parts.

1.2 SECTION INCLUDES

.1 Paint all surfaces to remain exposed in the finished work whether specifically indicated or not, except shop and factory finished items and those specifically indicated not to be painted. No surface shall have less than one prime coat and two finish coats.

- .1 Paint walls and ceiling as specified herein except as noted on drawings.
- .2 Paint all doors.
- .3 Paint exposed electrical panels and pipes to match walls or ceiling wherever it is applicable.
- .4 Paint all items such as access hatch, door and ceiling grilles, Fire Extinguisher cabinets, and covers to match adjacent surfaces.
- .5 Paint all exposed piping and ducts.
- .6 Paint exposed interior steel, stair, handrails, guardrails.

.2 Colour Scheme: colours as selected by Consultant. Allowable manufacturer: Dulex only, no substitution is allowed.

.3 Field-applied dry-erase coatings, including surface preparation and primer

1.3 RELATED SECTIONS

.1	Metal Fabrication	Section 05 50 00
.2	Finish Carpentry	Section 06 20 00
.3	Wood Doors	Section 08 14 00
.4	Finish Schedule	Section 09 06 00
.5	Gypsum Board	Section 09 29 00

1.4 QUALITY ASSURANCE

.1 This Contractor shall have a minimum of five (5) years proven satisfactory experience and shall show proof before commencement of work that he will maintain a qualified crew of painters throughout the duration of the work. When requested, Contractor shall provide a list of the last three comparable jobs including name and location, specifying authority/project manager, start and completion dates and cost amount of the painting work.

.2 Only qualified journeymen who have a “Tradesman Qualification Certificate of Proficiency” shall be engaged in painting and decorating work. Apprentices may be employed provided they work under the direct supervision of a qualified journeyman in accordance with trade regulations.

.3 Conform to the standards contained in the Master Painters Institute Architectural Painting Specification Manual, latest edition (hereafter referred to as MPI Painting Specification Manual) for all painting products including preparation and application of materials. MPI Painting Specification Manual as issued by the local MPI Accredited Quality Assurance Association having jurisdiction.

.4 All paint manufacturers and products used shall be as listed under the “Approved Products” section of the MPI Painting Specification manual U.O.N.

.5 Other paint materials shall be the highest quality product of an approved manufacturer listed in MPI Painting Specification Manual and shall be compatible with other coating materials as required.

.6 Single-Source Responsibility: provide primers and undercoat paint produced by the same manufacturer as the finish coat.

.7 All surfaces requiring painting or repainting shall be inspected by the inspection agency who shall advise on all aspects of painting work including preparation, notifying the Consultant, the Contractor and the Trade Contractor of any defects or problems prior to commencing painting work or after the prime coat shows defects in the substrate, and as the work progresses.

.8 Standard of Acceptance:
- .1 Wall: No defects visible from a distance of 1000mm at 90° to surface.
- .2 Final coat to exhibit uniformity of colour and uniformity of sheen across full surface area.

1.5 REGULATORY REQUIREMENTS

.1 Conform to workplace safety regulations for storage, mixing, application and disposal of all paint related materials to requirements of those authorities having jurisdiction.

.2 Conform to safety precautions in accordance with the latest requirements to Industrial Health and Safety Regulations, latest edition, of authorities having jurisdiction.

1.6 SAMPLES AND MOCK-UPS

.1 When requested by the Consultant or Paint Inspection Agency, provide duplicate minimum 300 mm (12”) square samples of surfaces or acceptable facsimiles requested painted with specified paint or coating in colours, gloss/sheen and textures required to MPI Architectural Painting Specification Manual standards for review and approval. When approved, samples shall become acceptable standard of quality for appropriate on-site surface with one of each sample retained on-site.

.2 When requested by the Consultant or Paint Inspection Agency, prepare and paint designated surface, area, room or item (in each colour scheme) to requirements specified herein, with specified paint or coating showing selected colors, gloss/sheen, textures and workmanship to MPI Architectural Painting Specification Manual standards for review and approval. When approved, surface, area, room and/or items shall become acceptable standard of finish quality and workmanship for similar on-site work.

1.7 SUBMITTALS

.1 All submittals shall be in accordance with the requirements of Section 01 33 00 – Submittals.

.2 Submit a list of all painting materials to the Consultant for review prior to ordering materials.

.3 Submit two sets of Material Safety Data Sheets (MSDS) prior to commencement of work for review and for posting at job site as required.

.4 Submit certification reports for ecologo paint products used.

.5 When requested, submit invoice list of all paint materials ordered for project work to Consultant indicating manufacturer, types and quantities for verification and compliance with specification and design requirements.

.6 When requested or required by painting of occupied areas, submit work schedule for various stages of work for the Consultant’s review and Owner’s approval.

.7 At project completion provide an itemized list complete with manufacturer, paint type and colour coding for all colours used for Owner's later use in maintenance.

.8 At project completion provide properly packaged maintenance materials as noted herein and obtain a signed receipt.

1.8 DELIVERY, STORAGE AND HANDLING

.1 Deliver all painting materials in sealed, original labeled containers bearing manufacturer's name, brand name, type of paint or coating and colour designation, standard compliance, materials content as well as mixing and/or reducing and application requirements.

.2 Store all paint materials in original labeled containers in a secure (lockable), dry, heated and well ventilated single designated area meeting the minimum requirements of both paint manufacturer and authorities having jurisdiction and at a minimum ambient temperature of 45 degrees F (7 degrees C). Only material used on this project to be stored on site.

.3 Where toxic and/or volatile/explosive/flammable materials are being used, provide adequate fireproof storage lockers and take all necessary precautions and post adequate warnings (e.g., no smoking) as required. Take adequate measures to prevent the release of volatile organic compounds (VOC) into the atmosphere.

.4 Take all necessary precautionary and safety measures to prevent fire hazards and spontaneous combustion and to protect the environment from hazard spills. Materials that constitute a fire hazard (paints, solvents, drop clothes, etc.) shall be stored in suitable closed and rated containers and removed from the site on a daily basis.

.5 Comply with requirements of authorities having jurisdiction, in regard to the use, handling, storage and disposal of hazardous materials.

1.9 PROJECT / SITE REQUIREMENTS

.1 UNLESS specifically pre-approved by the Consultant, perform no painting or decorating work when the ambient air and substrate temperatures are below 50 degrees F (10 degrees C) for both interior and exterior work.

.2 Perform no painting or decorating work when the relative humidity is above 85% or when the dew point is less than 5 degrees F (3 degrees C) variance between the air/surface temperature.

.3 Perform no painting or decorating work when the maximum moisture content of the substrate exceeds:

- 12% for concrete and masonry (clay and concrete brick / block).
- 15% for wood.
- 12% for plaster and gypsum board.

.4 Conduct all moisture tests using a properly calibrated electronic Moisture Meter, except test concrete floors for moisture using a simple "cover patch test."

.5 Test concrete, masonry and plaster surfaces for alkalinity as required.

NOTE: Concrete and masonry surfaces must be installed at least 28 days prior to painting and decorating work and must be visually dry on both sides. This is not to be construed as including a "wetting down" process for Latex.

.6 Perform no painting or decorating work unless a minimum lighting level of 323 Lux (30 foot candles) is provided on surfaces to be painted or decorated. Adequate lighting facilities shall be provided by the General Contractor.

.7 Perform no painting or decorating work unless adequate continuous ventilation and sufficient heating facilities are in place to maintain ambient air and substrate temperatures above 50 degrees F (10 degrees C) for 24 hours before, during and after paint application. Provide supplemental ventilating and heating equipment if ventilation and heating from existing system is inadequate to meet minimum requirements.

.8 Apply paint only to dry, clean, properly cured and adequately prepared surfaces in areas where dust is no longer generated by construction activities such that airborne particles will not affect the quality of finished surfaces.

1.10 SCHEDULING

.1 Schedule painting operations to prevent disruption of and by other trades.

.2 Schedule painting operations to prevent disruption of occupants in and about the building. Obtain written authorization from Consultant for changes in work schedule.

1.11 EXISTING CONDITIONS

.1 Before starting work ensure that surfaces are clean and dry and free of defects before commencing painting. Starting work shall imply acceptance of surfaces for painting.

1.12 PROTECTION

.1 Protect adjacent work from droppings, overrun, damage or disfigurement.

.2 Coordinate with Division 16 to remove electrical plates, surface hardware, fittings and fastenings, prior to painting operations. These items shall be carefully stored, cleaned and replaced on completion of work in each area. No solvent shall be used to clean hardware that will remove the permanent lacquer finish on some of these items

.3 Protect items that are permanently attached such as Fire Labels on doors and frames.

.4 Move and cover furniture and portable equipment as necessary to carry out painting operations. Replace as painting operations progress.

.5 As painting operations progress, place “WET PAINT” signs in occupied areas.

.6 Make good all damage caused without extra expense to Owner and to Consultant's satisfaction.

1.13 GUARANTEE

.1 Furnish either the local *MPI* Accredited Quality Assurance Association’s two (2) year guarantee, or, alternatively, a 100% two (2) year Maintenance Bond - both in accordance with *MPI* Painting Manual requirements. The Maintenance Bond shall warrant that all painting work has been performed in accordance with *MPI* Painting Manual requirements.

.2 All painting and decorating work shall be in accordance with *MPI* Painting Manual requirements and shall be inspected by the local *MPI* Accredited Quality Assurance Association’s Paint Inspection Agency (inspector), whether using either the *MPI* Accredited Quality Assurance Association’s guarantee, or the Maintenance Bond option. The cost for such inspections, and for either the local *MPI* Accredited Quality Assurance Association’s Guarantee, or the Maintenance Bond, shall be included in the Base Bid Price.

.3 Painting and decorating Subcontractors choosing the Maintenance Bond option shall provide a maintenance bond consent from a reputable surety company licensed to do business in Canada. Cash or certified check are not acceptable in lieu of surety consent.

1.14 MAINTENANCE MATERIALS

.1 At project completion provide 4 litres (1 gallon) of each type and colour of paint from the same production run (batch mix) used in unopened cans, properly labeled and identified for Owner's later use in maintenance. Store where directed.

2.0 PRODUCTS

2.1 MATERIALS

.1 All materials shall be manufacturer's best quality products, and in accordance with the MPI Architectural Painting Specification Manual "Approved Product" listing and shall be from a single manufacturer for each system used.

.2 Paints shall be ready-mixed unless otherwise specified, except that any coating in paste or powder form, or to field-catalyzed shall be field-mixed in accordance with the directions of its manufacturer. Pigments shall be fully ground and shall maintain a soft paste consistency in the vehicle during storage that can and shall be dispersed readily and uniformly by paddle to a complete homogeneous mixture.

.3 The paint shall have good flowing and brushing properties and shall dry or cure free of streaks or sags, to yield the desired finish specified.

.4 Shellac and turpentine to be best quality, and to be compatible with other best materials as required.

.5 All materials and paints shall be LEED compliance with low / no VOC content.

.6 Where required, paint products shall meet the requirements of the Environmental Choice Program, Department of the Environment. Water based paints to be certified to ECP-12-89.

.7 Slip resistant additives (SRA) – rubber aggregate, clean/washed silica sand or ground walnut chips (interior dry areas only) for use with or as a component part of paint (usually floor/porch/stair enamel) on horizontal surfaces as required to provide slip resistance. Where site applied, material to either be mixed into paint (and mixed constantly to keep material in suspension) or broadcast into first or prime coat as required.

2.2 EQUIPMENT

.1 Painting and decorating equipment – to best trade standards for type of product and application.

.2 Spray painting equipment – of ample capacity, suited to the type and consistency of paint or coating being applied and kept clean and in good working order at all times.

2.3 MIXING AND TINTING

.1 Unless otherwise specified, paints shall be ready-mixed. Re-mix prior to application to ensure colour and gloss uniformity.

.2 Paste, powder or catalyzed paint mixes shall be mixed in strict accordance with manufacturer's written instructions.

.3 Perform all colour tinting operations prior to delivery of paint to site.

.4 Where thinner is used, addition shall not exceed paint manufacturer's recommendations.

2.4 GLOSS

.1 Paint gloss shall be defined as the sheen rating of applied paint, in accordance with the following values:

Gloss Level 1	A traditional matte finish - flat	Max 5 units, and	Max 10 units
Gloss Level 2	A high side sheen flat – a “velvet-like” finish	Max 10 units, and	10-35 units
Gloss Level 3	A traditional eggshell-like finish	10-25 units, and	10-35 units
Gloss Level 4	A ‘satin-like finish	20-35 units, and	Min 35 units
Gloss Level 5	A traditional semi-gloss	35-70 units,and	
Gloss Level 6	A traditional gloss	70-85 units, and	
Gloss Level 7	A high gloss	More than 85 units	

2.5 INTERIOR PAINTING SYSTEMS – NEW CONSTRUCTION

.1 Galvanized metal: doors frames and door.

.1 INT 5.3K - Waterborne light industrial gloss level 4 coating (over waterborne primer).

.2 Dressed lumber: door frames:

.1 INT 6.3A - High performance architectural latex gloss level 5 finish.

.3 Plaster and gypsum board: gypsum wallboard, drywall, "sheet rock type material", and textured finishes:

.1 INT 9.2A - Latex gloss level 3 finish (over latex sealer).

2.6 INTERIOR REPAINTING SYSTEMS

.1 Plaster and Gypsum Board Surfaces: gypsum wallboard, drywall, “sheet rock type material”, etc.

.1 RIN 9.2A Latex, gloss level 3 finish for wall typical, gloss level 1 finish for ceiling typical.

.2 Wood Door:

.1 RIN 6.3T High Performance architectural Latex (gloss Level5) over Latex primer.

2.7 FINISHES

.1 Colours shall be as selected by the Consultant from a manufacturer’s full range of colours. Refer to Finish Schedule and Finish Drawings for identification and location of colours.

.2 Access doors, prime coated butts and other prime painted hardware (e.g., door closers), registers, radiators and covers, exposed piping and electrical panels shall be painted to match adjacent surfaces (ie, colour, texture and sheen), unless otherwise noted or where pre-finished.

.3 Plywood service panels (e.g., electrical, telephone and cable vision panels) including edges shall be back-primed and painted to match painted wall mounted on.

.4 The inside of light valences shall be painted gloss white.

.5 The inside of all ductwork behind louvres, grilles and diffusers for a minimum of 460mm (18”) or beyond sightline, whichever is greater, shall be painted using flat black (non-reflecting) paint, unless otherwise noted.

.6 Where other methods are not specified (ie. applied material or nosings) and/or in accordance with the requirements or authorities having jurisdiction at stairs providing access and exit for persons with visual impairment, slip resistant paint shall be applied to handrails and treads. Slip resistant paint shall be of a contrasting colour at tactile warning strips at stair treads and landings.

.7 The consultant shall decide the extent of all colour areas, where the colour shall terminate or commence, and where colour and texture shall match or contrast with adjacent areas.

3.0 EXECUTION

3.1 CONDITION OF SURFACES

.1 Prior to commencement of work of this section, thoroughly examine surfaces scheduled to be painted.

.2 Complete finishing operations, including painting, before beginning installation of dryerase coatings.

.3 Wall surfaces to receive painting shall be dry and free from dirt, grease, loose paint and scale.

.4 Report in writing to the Consultant any condition adversely affecting this work.

.5 Do not proceed with Work until all such defects have been corrected and surfaces are acceptable to the Painting Contractor.

.6 Commencement of work shall be held to imply acceptance of surfaces except as qualified herein.

3.2 PREPARATION

Before applying the paint, the various surfaces shall be prepared as described below:

.1 Steel and Iron: work must be thoroughly cleaned - preferably by power tools - to remove all dirt, rust, scale, gypsum cement, concrete or any other foreign matter before paint is applied. Grease, oil, etc., shall be removed by washing with a suitable solvent. Iron and steel surfaces shall in general be primed with red oxide zinc chromate metal primer where not previously shop primed. Galvanized metal surfaces shall be washed with a galvanized etch, rinsed off thoroughly and primed with a first coat metal primer. Touch up shop paint primer on steel to CGSB 85-GP-16M.

.2 Drywall: Cut out scratches, cracks and abrasions in surfaces and adjoining trim as required. Fill with patching compound. Finish flush with adjoining surface and sand smooth and even when dry. Prime surface to show defects, if any. Continue painting only after defects are corrected.

.3 Surface Preparation: Remove hardware, accessories, plates and similar items to allow dryerase coatings to be installed.

.1 Repair dmaged areas by filling voids with spackle. Sand smooth repaired or texture surfaces. Scuff glossy and non-porous surfaces using medium grit sandpaper. Paint product is a high gloss coating; imperfections and visible seams will telegraph.

.2 Gypsum Board Surface: Provide Level 4 finish per ASTM C840 and GA-214. Recess nails and screws. Repair irregular tape joints, sand and remove dust.

.3 Previously Painted Surface: Remove loose paint or scale. Sand surface of enamel or gloss paint and remove dust with tack cloth or denatured alcohol.

.4 Ventilate area thoroughly to prevent the odor from permeating to other areas in the building. Provide 100 percent outside air ventilation of application areas.

3.3 APPLICATION - PAINTS

.1 Use method of paint application generally as accepted by the trade method.

.2 Painting coats specified are intended to cover surfaces satisfactorily when applied in strict accordance with recommendations. Apply each coat at the proper consistency.

.3 Sand lightly and dust between coats to achieve required finish.

.4 Do not apply finishes on surfaces that are not sufficiently dry. Each coat of finish should be dry and hard before a following coat is applied unless the manufacturer's directions state otherwise.

.5 Back prime interior woodwork which is to receive a paint or enamel finish upon arrival at the job site with enamel undercoater paint. Finish tops of cabinet and projecting ledges, both above and below sightlines as specified for surrounding surfaces.

.6 Immediately after fitting and sanding and before hanging, seal the entire door with undercoater, stain or varnish as specified, including the top, bottom, opening and hardware recess edges. Finish with at least two coats of good quality oil based paint, varnish or lacquer as specified.

.7 Paint mechanical and electrical equipment, pipes conduit, hangers, ducts and access panels in rooms scheduled to be painted.

.8 Paint exposed steel framing, decking, joists and bracing in rooms scheduled to be painted.

.9 Apply paint and decorating material in a workmanlike manner using skilled and trade qualified applicators as noted under Quality Assurance.

.10 Minimum painting standards shall be in accordance with MPI Architectural Painting Specification Manual Premium Grade finish requirements.

.11 Paint all surfaces requiring paint or stain finish to minimum MPI Architectural Painting Specification Manual finish requirements with application methods in accordance with best trade practices for type and application of materials used.

.12 Apply paint and coatings within an appropriate time frame after cleaning when environmental conditions encourage flash-rusting, rusting, contamination or the manufacturer's paint specifications require earlier applications.

.13 Painting coats specified are intended to cover surfaces satisfactorily when applied at proper consistency and in accordance with manufacturer's recommendations.

.14 Tint each coat of paint progressively lighter to enable confirmation of number of coats.

.15 Apply a minimum of three coats to all surfaces to be painted. Apply a minimum of four coats, or more of paint where deep or bright colours are used to achieve satisfactory results. Apply four coats or more for existing dark surface to receive light new paint colour to cover all existing colour.

.16 Sand and dust between each coat to provide an anchor for next coat and to remove defects visible from a distance up to 1000mm (39").

.17 Prime coat of stain or varnish finishes may be reduced only in accordance with manufacturer's directions.

3.4 COLOUR SCHEDULE

.1 All paint colours to be applied to the following areas unless noted otherwise. Also refer to drawings and Section 09 06 00.3 Finish Schedule for details:

.1	PT-1	Dulux Paints	98YY 82/022	White High-Hiding RM
.2	PT-2	Dulux Paints	30YY 46/036	Zeppelin
.3	PT-3	Dulux Paints	10BG 39/244	Vista Marine
.4	PT-4	Dulux Paints	50YR 26/033	Ominous
.5	PT-5	Dulux Paints	20YY 54/342	Pate Shell

END OF SECTION 09 91 00

1.0 GENERAL

1.1 DOCUMENTS

.1 This Section of the Specifications forms part of the Contract Documents and is to be read, interpreted and coordinated with all other parts.

1.2 SECTION INCLUDES

.1 Application of epoxy coating system including surface preparation, primer and finish coats in Washromm/Shower Room walls and ceiling.

1.3 RELATED REQUIREMENTS

.1 Joints Sealants Section 07 92 00

.2 Gypsum Board Section 09 29 00

.3 Resinous Flooring Section 09 67 23

1.4 SUBMITTALS

.1 Product Data: submit manufacturer's technical data, installation instructions, and general recommendations for each resinous wall material required. Include certification indicating compliance of materials with requirements.

.2 Samples: submit, for verification purposes, 100 mm square samples of each type and colour of epoxy coating system required, applied to a rigid backing, in colour and finish indicated.

.3 Applicator Certificate: Submit "Authorized Applicator" certificate issued to system applicator by coating material manufacturer.

1.5 QUALITY ASSURANCE

.1 Single Source Responsibility: obtain primary epoxy coating materials including primers, resins, hardening agents, finish or sealing coats from a single manufacturer with not less than ten years of successful experience in manufacturing and installing principal materials described in this section. Contractor shall have completed at least five projects of similar size and complexity. Provide secondary materials only of type and from source recommended by manufacturer of primary materials.

.2 Only applicators trained by the system manufacturer are to be employed to install this system.

.3 Pre-installation conference:

- .1 General contractor shall arrange a meeting not less than thirty days prior to starting work.
- .2 Attendance:
  - .1 General contractor
  - .2 Architect/Owner's representative
  - .3 Manufacturer/Installer's representative

.3 Mock-up: On site, fabricate a 4x8' mock-up panel to demonstrate quality of finished wall system, complying with manufacturer's instructions. Install panel where directed by architect/engineer. Maintain panel as a standard of quality for all installations.

1.6 DELIVERY, STORAGE AND HANDLING

.1 Material shall be delivered to job site and checked by wall contractor for completeness and shipping damage prior to job start.

.2 All materials used shall be factory pre-weighed and pre-packaged in single, easy-to-manage batches to eliminate on site mixing errors. No on-site weighing or volumetric measurements allowed.

.3 Deliver product in factory packages, clearly marked with manufacturer's identification, printed instructions, lot numbers and shelf life expiration date for each component.

.4 Store materials at 50˚F to 90˚F (10˚C to 32˚C) in dry environment away from sunlight, heat, or other hazards.

1.7 PROJECT CONDITIONS

.1 Provide interior environment suitable for installation of resinous finish. Provide supplemental ventilation as required to control odours.

.2 Ensure that surfaces to receive coating products are above 13°C(55°F) or below 29°C (85°F) for a minimum of 48 hours prior to installation.

.3 Substrate must be free of hydrostatic, capillary or moisture vapor pressure. Substrates in contact with ground must have a properly installed, effective vapor barrier to help prevent potential problems resulting from hydrostatic, capillary or moisture vapor pressure. Concrete must contain less than 3% moisture when tested per ASTM D 1864.

.4 Do not apply sealers or membrane curing agents to concrete. Moisture curing of concrete is recommended.

.5 Concretes containing lightweight aggregates are not recommended substrates.

.6 Provide ventilation, lighting and clean, drinkable water supply.

.7 Advise other trades of fixtures and fittings not to be installed until system is cured, such as: radiators, painting, decorating, floor-supported equipment or cabinetwork, caulking, plumbing, fixtures, etc.

.8 Work areas shall be kept free of traffic and no trades shall be permitted in rooms during the application and curing of the coating. Provide temporary barriers and supervision necessary to control traffic during coating operations.

.9 Protect adjacent surfaces from damage resulting from work of this trade. If necessary, mask and/or cover adjacent surfaces, fixtures, equipment, etc. by suitable means.

2.0 PRODUCTS

2.1 MATERIALS

.1 General: A Technical Representative from the manufacturer shall be available on three days notice at the demand of the project consultant to provide advice during the installation of the flooring system to ensure that the applicator follows the installation recommendations of the manufacturer.

.2 Epoxy Wall Coating System:

.1 Location: Full height wall to ceiling and ceiling in Washroom/Shower room. Refer to drawings and Finish Schedule.

.2 Two components, 90% solids content epoxy coating, two component, high solids low VOC, water based epoxy finish coat. C/w antimicrobial and anti-fungicidal additives.

.3 Colour: Ceiling – White; Walls – RAL 6027.

.4 Approved Product: Sikagard Duroplast by Sika.

.1 Primer: Sikagard Duroplast PS
.2 Coating: Sikagard Duroplast 100 (two coats @ 6-8 mils d.f.t.)
.3 Finish Coats: Sikagard Duroplast 150 (one coat @ 3-4 mils d.f.t.)

.3 Sealant: epoxy polyurethane, non-sag joint filler for vertical surfaces – Sikaflex 2c NS EZ mix.

3.0 EXECUTION

3.1 INSPECTION

.1 Before starting work, ensure that environmental and site conditions are suitable for application and curing.

.2 Inspect surfaces for acceptability of levelness, moisture content and other critical factors at time of installation.

.3 Report in writing to architect/engineer, with copy to manufacturer, of deficiencies that could impair work. Surfaces must be approved by the certified contractor prior to application of the system.

.4 Do not apply coating system if ambient temperature is below 10°C (50°F) or above 32°C (90°F) or if relative humidity is above 80%.

3.2 SURFACE PREPARATION

.1 Prepare surfaces in accordance with manufacturer's instructions.

.2 Remove concrete laitance by steel shot blasting, grit blasting, or other method approved by manufacturer.

.3 Surface must be clean, sound and dry prior to application.

.4 Pre-fill surface irregularities, holes and cracks in accordance with manufacturer's recommendations.

3.3 MIXING

.1 Comply with manufacturer's instructions for mixing procedures.

.2 Pre-mix each component before every batch to ensure uniformity.

.3 Carefully measure and mix the components together.

3.4 INSTALLATION

.1 Follow manufacturer's written instructions.

.2 Prime entire surface with recommended primer.

.3 Apply each component of epoxy coating system in compliance with manufacturer's directions to produce a pinhole free surface. Total dry film thickness of epoxy finish coat only to be 18 to 20 mils uninterrupted except at expansion joints.

.4 Apply grout coat(s) and topcoat(s) at manufacturer's recommended coverage to provide uniform, dense surface.

.5 Apply urethane caulking at stainless steel cap strip of epoxy base to provide continuous moisture proof system.

.6 Allow proper cure time for each installation step.

.7 Allow the finished system to cure for a minimum of 7 days from completion before putting into service.

3.5 CURING, PROTECTION AND CLEANING

.1 Cure resinous wall materials in compliance with manufacturer's directions, taking care to prevent contamination during stages of application and prior to completion of curing process. Close area of application for a minimum of 24 hours.

.2 Protect resinous wall materials from damage and wear during construction operation. Where temporary covering is required for this purpose only, comply with manufacturer's recommendations for protective materials and method of application.

.3 Cleaning: remove temporary covering and clean epoxy coating system just prior to final inspection. Use cleaning materials and procedures recommended by epoxy wall coating system manufacturer.

END OF SECTION 09 96 56

1.0 GENERAL

1.1 RELATED REQUIREMENTS

.1 Section 09 21 00 Gypsum Board

1.2 REFERENCES

.1 Aluminum Association, Inc. (AAI)
- .1 AAI DAF45-03, Designation System for Aluminum Finishes.

.2 ASTM International Inc.
- .1 ASTM A 653/A 653M-07, Standard Specification for Steel Sheet, Zinc-Coated, (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
- .2 ASTM B 32-04, Standard Specification for Solder Metal.
- .3 ASTM B 456-03, Standard Specification for Electrodeposited Coatings of Copper Plus Nickel Plus Chromium and Nickel Plus Chromium.

.3 Canada Green Building Council (CaGBC)
- .1 LEED Canada-CI 1.0-2007, LEED (Leadership in Energy and Environmental Design): Green Building Rating System Reference Package For Commercial Interiors

.4 Canadian General Standards Board (CGSB)
- .1 CAN/CGSB-1.81-M90, Air Drying and Baking Alkyd Primer for Vehicles and Equipment.
- .2 CAN/CGSB-1.88-92, Gloss Alkyd Enamel, Air Drying and Baking.
- .3 CGSB 31-GP-107Ma-90, Non-Inhibited Phosphoric Acid Base Metal Conditioner and Rust Remover.
- .4 CGSB 41-GP-6M-1983, Sheets, Thermosetting Polyester Plastics, Glass Fibre Reinforced. Reaffirmation of September 1976.

.5 Canadian Standards Association (CSA International)
- .1 CAN/CSA-G164-M92(R2003), Hot Dip Galvanizing of Irregularly Shaped Articles.
- .2 CSA W47.2-M1987(R2008), Certification of Companies for Fusion Welding of Aluminum.
- .3 CSA W59-03, Welded Steel Construction (Metal Arc Welding).
- .4 CSA W59.2-M1991(R2003), Welded Aluminum Construction.

.6 Canadian Sheet Steel Building Institute (CSSBI)
- .1 CSSBI SSF 6-1995, Sheet Steel Facts #6, Metallic Coated Sheet Steel for Structural Building Products-July 1995.

.7 Green Seal Environmental Standards
- .1 Standard GS-11-2008, 2nd Edition, Paints and Coatings.
- .2 Standard GS-36-00, Commercial Adhesives.

.8 Health Canada/Workplace Hazardous Materials Information System (WHMIS)
- .1 Material Safety Data Sheets (MSDS).

.9 South Coast Air Quality Management District (SCAQMD), California State
- .1 SCAQMD Rule #1113-A2007, Architectural Coatings.
- .2 SCAQMD Rule #1168-A2005, Adhesive and Sealant Applications.

.10 The Master Painters Institute (MPI)
- .1 Architectural Painting Specification Manual – latest edition.
  - .1 MPI #76, Quick Dry Alkyd Metal Primer.

.2 MPI #96, Quick Dry Enamel Gloss.

1.3 SUBMITTALS

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

.2 Shop Drawings- provide shop drawings showing graphics and color, and joint as applicable.

.3 Samples:

.1 Submit duplicate representative 300x300 sample of each vinyl film type showing representational pictures and text printing.

1.5 QUALITY ASSURANCE

.1 Welding Certification in accordance with CSA W47.2.

.2 Sustainability Standards Certification:

.1 Construction Waste Management (CWM)

.2 Recycled Content:

.1 Provide listing of recycled content products used, including details of required percentages of recycled content materials and products, showing their costs and percentages of post-consumer and post-industrial content, and total cost of materials for project.

1.6 DELIVERY, STORAGE AND HANDLING

.1 Packaging Waste Management:

.1 Remove for reuse and return by manufacturer of pallets, crates, padding, and packaging materials in accordance with Section 01 74 19 – Waste Management.

2.0 PRODUCTS

2.1 MATERIALS

.1 Graphic film to be tough, scuff-resistant, flexible and with consistent printability.

.2 Vinyl film on storefront glazing to have removable adhesive performance.

.3 Vinyl film on gypsum wall board to have permanent adhesive performance.

.4 Physical Characteristics:

PROPERTY		VALUE
Caliper, face Caliper, adhesive		3.4 mil (97 µm) 1.0 mil (25 µm)
Dimensional Stability		<0.065” (1.651mm)
Tensile at Yield		
Elongation		
Gloss	Hunter Gloss @60	55 +/-10
Adhesion: 15 min	Permanent	3.2 lbs/in (560N/m)
15 min	Removable	1.0 lbs/in (175N/m)
Flammability		Self-extinguishing
Shelf Life		1 year
Durability	Vertical Exposure	Unprinted-5year, Printed-up to 4 years
Min. Application Temperature		50°F (10°C)
Service Temperature		-40º- 180ºF (-4º- 82ºC) (Reasonable range

	of temp which would be expected under normal environmental conditions)
Chemical Resistance	Resistant to most mild acids, alkalis, and salt solutions

.5 Apply a layer of luster laminate on top of the vinyl graphic film for protection.

2.2 DIGITAL GRAPHICS

.1 Digital printing using AGFA Anapurna M2050 printer or approved equal – high speed UV curable inkjet system using UV inks in CMYK + LcLm + White, with pre and post-white capability on dark surfaces; good ink adhesion for high image longevity and outdoor resistance; direct printing to rigid and painted substrates up to 45 mm thick and 2050 mm wide borderless; direct printing to variety of roll media including film, vinyl, paper, canvas and banners; top quality printing at quality as high as 720 x 1440 dpi, capable of rendering crisp text as small as 4 and 6 point negative.

.2 All screened inks shall be made by a manufacturer with experience in production and consistency of such inks for the purpose and surfaces involved.

.3 No paint, ink, or lacquer that will fade, discolor or de-laminate as a result of proximity to UV light source shall be used.

.4 All inks, paints and lacquers shall be evenly applied and without pinholes, scratches, peeling, application marks, etc.

.5 Prime condition or other surface pre-treatments where recommended by the manufacturer shall be included in the work and noted on the shop drawings.

.6 All sign surfaces shall be free of buckles, warping, oil canning effect and shall have faces of such flatness that when measured from corner to corner along the diagonal, the maximum deviation from the nominal plane of the surface shall not exceed 1/16" for measured distances of up to 6' -0", and 1/8" for measured distances 6' - 0" and greater.

2.3 FABRICATION

.1 Fabricate signs in accordance with details, specifications and shop drawings.

.2 Install square, true, accurate to size, free from visual or performance defects.

.3 Fit and securely join sections to obtain tight, closed joints.

.4 Allow for thermal movement without distortion of components.

3.0 EXECUTION

3.1 INSTALLATION

.1 Manufacturer's Instructions: compliance: comply with manufacturer's written recommendations or specifications, including product technical bulletins, handling, storage and installation instructions, and data sheets.

.2 Install graphics plumb and level at elevations as directed by Departmental Representative.

.3 Comply with sign manufacturer's installation instructions and approved shop drawings.

3.2 CLEANING

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

.1 On completion and verification of performance of installation, remove surplus materials, excess materials, rubbish, tools and equipment.

.2 Leave signs clean.

.3 Remove debris from interior of sign boxes.

.4 Touch up damaged finishes.

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

END OF SECTION 10 14 00

1.0 GENERAL

1.1 DOCUMENTS

.1 This Section of the Specifications forms part of the Contract Documents and is to be read, interpreted and coordinated with all other parts.

1.2 SECTION INCLUDES

.1 Washroom accessories.

.2 Refer to Section 3.6 Schedule of the specification for scope of work.

1.3 RELATED SECTIONS

.1 Rough Carpentry Section 06 10 00

.2 Finish Carpentry Section 06 20 00

1.4 SUBMITTALS

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

.2 Clearly indicate size and description of components, base materials, surface finish inside and out, hardware and locks, attachment devices, and description of rough-in framing required.

.3 Submit samples of components for the Consultant's approval, in specified material and finish.

.4 Provide maintenance instructions for inclusion in the operation and maintenance manuals.

.5 Provide copies of manufacturer's standard warranties for inclusion in operation and maintenance manuals.

.6 Furnish tools and extra materials that match products installed and that are packaged with protective covering for storage and identified with labels describing contents as specified in Section 01 78 00 – Closeout Submittals.

.1 Tools: Provide special tools required for assembly, disassembly or removal for washrooms accessories.

.2 Security Fasteners: Furnish not less than 1 box for each 50 boxes or fraction thereof, of each type and size of security fastener installed.

1.5 QUALITY ASSURANCE

.1 Installers: Factory-trained personnel having a minimum of five (5) years proven experience in the installation of washroom accessories for projects of similar size and complexity.

.2 Regulatory Requirements: Design and installation in accordance with Vancouver Building Bylaw 2014, "Building Requirements for Persons with Disabilities".

1.6 PRODUCT DELIVERY, HANDLING, STORAGE

.1 Deliver material in protective covering to prevent damage during shipping and handling.

.2 Store materials in cartons, protected, in a dry secure area.

2.0 PRODUCTS

2.1 MATERIALS

.1 Sheet Steel: ASTM A526 commercial quality, galvanized to ZF075.

.2 Stainless Steel Sheet: ASTM A167, Type 304, commercial grade, No. 4 Satin Finish.

.3 Stainless Steel Tubing: ASTM A312, Type 304, commercial grade, seamless, 1.2 mm wall thickness minimum, No. 4 Satin Finish.

.4 Fasteners: Concealed screws and bolts hot-dip galvanized; expansion shields synthetic lead or rubber as recommended by the fixture manufacturer for component and substrate; exposed fasteners stainless steel, tamperproof.

.5 Cold-Rolled Steel Sheet: ASTM A 1008/A 1008M, CS (Commercial Steel), Type B.

.6 Metallic-Coated Steel Sheet: ASTM A 653/A 653M, CS (Commercial Steel), Type B; with Z180 zinc galvanized coating designation.

.7 Stainless-Steel Sheet: ASTM A 666 or ASTM A 240/A 240M, austenitic stainless steel, Type 304; Type 430 for mirrors.

.8 Steel Plates, Shapes, and Bars: ASTM A 36/A 36M.

.9 Welding Rods and Bare Electrodes: Select according to AWS specifications.

2.2 FINISHES

.1 Chrome and nickel plating: to ASTM B 456, satin finish, U.O.N.

.2 Galvanized Metal: (Unexposed after installation) shop prime damaged surfaces after fabrication with zinc-rich primer.

.3 Steel Galvanizing: Hot-dip galvanize products made from rolled-, pressed-, and forged-steel shapes, castings, plates, bars, and strips indicated to be galvanized to comply with ASTM A 123/A 123M.

.4 Stainless Steel:

.1 General: Remove tool and die marks and stretch lines or blend into finish. Grind and polish surfaces to produce uniform, directionally textured, polished finish indicated, free of cross scratches. Run grain with long dimension of each piece.

.2 Intermediate Polish Finish: No. 4 unless otherwise indicated.

.3 Grind and polish mirrored surfaces to produce uniform, mirror-polished finish indicated, free of cross scratches.

.4 When polishing is completed, passivate and rinse surfaces. Remove embedded foreign matter and leave surfaces chemically clean.

2.3 FABRICATION

.1 Weld and grind joints of fabricated components flush and smooth. Use mechanical fasteners only where approved.

.2 Wherever possible, form exposed surfaces from one (1) sheet of stock, free of joints.

.3 Brake form sheet metal work with 1.5 mm radius bends.

.4 Form surfaces flat and without distortion. Maintain flat surfaces without scratches or dents.

.5 Back paint components where contact is made with building finishes to prevent electrolysis.

.6 Hot-dip galvanize concealed ferrous metal anchors and fastening devices to CSA G164-M1981.

.7 Shop assemble components and package complete with anchors and fittings.

.8 Deliver inserts and rough-in frames to job site at appropriate time for building-in. Provide templates, details and instruction for building in anchors and inserts.

.9 Provide steel anchor plates and components for installation on studding and building framing.

2.4 ACCEPTABLE MANUFACTURERS

.1 Accessory model numbers listed in schedule are based on the manufacturer listed.

.2 Acceptable Alternative Manufacturers: ASI, Bradley, Frost, Kimberly-Clark.

.3 Alternative manufacturers: Allowed unless otherwise noted. Supply fixtures of like quality, finish and function. Alternative accessories not approved by the Consultant as like in quality, finish and function will be rejected and instructions given to provide the specified accessory in accordance with the specifications at no additional cost to the Owner.

3.0 EXECUTION

3.1 INSPECTION/PREPARATION

.1 Ensure frames, blocking and anchorage are correctly and securely installed ready to accept the accessory designed for it.

.2 Ensure rooms, surfaces and areas in which accessories to be installed are finished with all painting completed and dry.

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

3.2 INSTALLATION

.1 Conform to Vancouver Building Bylaw 2014 for installation requirements for accessible accessories.

.2 Install washroom accessories in accordance with the manufacturer's printed directions. Confirm exact location with the Consultant.

.3 Conceal fasteners wherever possible, compatible with substrates, and suitable for the purpose intended. Use exposed tamperproof fasteners where required.

.4 Secure accessories rigid, square and flush to wall surface, plumb, levels and in alignment with other work.

.5 Install and secure all fixtures rigidly in place using the following techniques:

.1 For stud walls, install steel back plate (where recommended by the manufacturer for specific items) to stud prior to drywall finish. Plate to have threaded studs or plugs provided.

.2 For hollow masonry units, use toggle bolts drilled into cell/wall cavity.

.3 In solid masonry or concrete, use bolt with lead expansion sleeve set into drilled hole.

.6 Install grab bars on built-in anchors provided by bar manufacturer.

.7 Fill units with necessary supplies shortly before final acceptance of building.

3.3 INSPECTION AND ADJUSTMENT

.1 Upon completion of installation, adjust all components for proper operation and alignment.

.2 Instruct the Owner's personnel in adjustment, operation, refilling procedures.

.3 Clean accessories, touch up all scratches and abrasions to be invisible.

3.4 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.

3.5 PROTECTION

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

.2 Repair damage to adjacent materials caused by washroom accessories installation.

3.6 SCHEDULE

.1 Refer to drawings for locations and quantities of washroom accessories.

.2 Grab Bars (GB): 30/32 mm dia x 1.6 mm wall tubing of stainless steel, peened gripping surface, 38 mm diameter wall flanges, concealed screw attachment, flanges welded to tubular bar, provided steel back plates and all accessories. Knurl bar at area of hand grips. Grab bar material and anchorage to withstand downward pull of 2.2kN. Configurations and sizes as indicated.
.1 Toilet Side Wall Angled Grab Bar: one (1) 24” x 24”, or 24” x 36”, 120 degree for 3 point mounting.
.2 Shower Grab Bar: one each (1) 24” x 36” long as shown on drawings.
.3 Acceptable manufacturer: Bobrick

.3 Mirror (MR): One-piece channel frame is 13 x 13 x 9.5 mm with bright polished finish and mitred corners. No. 1 quality, 6mm glass mirror electrolytically copper plated; guaranteed against silver spoilage for 10 years. Mirror corners and back protected by shock absorbing material. Back is galvanized steel, secured to concealed wall hanger with two theft-resistant locking screws. Acceptable manufacturer and product: Bobrick B-165 series, size to be 762mm (30”) wide x 915mm (36”) high.

.4 Folding Shower Seat (FSS): ½” thick solid phenolic folding shower set, 33” wide, projects 22 5/16” from wall, L-shaped seat. Acceptable manufacturer and product, Bobrick B-5181.

.5 Sanitary Napkin Disposal (ND): Type 304 22-gauge (0.8 mm) stainless steel surface-mounted sanitary napkin disposal with all-welded construction; satin-finish for all exposed surfaces. Drawn, one-piece, seamless construction cover, secured to container with a full-length stainless steel piano-hinge. Integral finger depression on container for opening cover. Capacity: 3.8 L. Unit dimension: 190 x 255 x 95 mm. Acceptable manufacturer and product: Contura Series Surface-mounted model #B-270 by Bobrick.

.6 Coat Hook (HK): Type 304 stainless steel satin finish surface-mounted hook strip. Back plate to be 22 gauge and hooks 14 gauge. Hook strip contains 4 numbers of hooks. Acceptable manufacturer and product: “BRADEX” model #9944 by Bradley.

.7 Toilet Tissue Dispenser (TTD): Toilet Tissue Dispenser to dispense rolls in 3.8” width with a 3.25” diameter core. Manual dispensing of 2 cored toilet paper rolls: either two JRT Jr. Rolls (two full 9.38” diameter) OR one JRT Sr. Roll (13” diameter) and a stub roll. Unit to have a hinged front cover, tear off bars, push button and a lock to reduce pilferage. ADA compliant when installed properly. Color: Black / Smoke. Size: 20.43” x 13.12” x 5.8”. Acceptable manufacturer and product: Insight Cored JRT Combo Bathroom Tissue Dispenser #09551 by Kimberly-Clark Professional.

.8 Shower Curtains (SC): Opaque white vinyl 0.2 mm thick shower curtains, containing anti-bacterial and flame-retardant agents with nickel-plated brass grommets along top. Hemmed bottom and

sides minimum 1830 mm high width to suit shower opening. Complete with type 304 1.2mm stainless steel satin- finish heavy duty shower curtain rod, 30 mm outside diameter, length to suit, and hooks from same manufacturer. Acceptable manufacturer and product: “CLASSIC SERIES” shower curtain rod model # B-6047 & shower curtain model #204 by Bobrick.

.9 Paper Towel Dispenser and Disposal (PTDD): Provide one (1) on east wall of washroom semi - recessed paper towel dispenser and waste receptacle shall be type 304 stainless steel with all-welded construction; exposed surfaces shall have satin-finish. Front of paper towel dispenser door and waste receptacle shall have slight arc. Flange shall be drawn, one-piece, seamless construction. Paper towel dispenser door shall be drawn, 18-gauge (1.2mm), one-piece, seamless construction; secured to cabinet with a full-length stainless steel piano-hinge; and equipped with a stainless steel cable door-swing limiter and flush tumbler lock key. Unit equipped with a 90° return towel guide angle inside cabinet to prevent paper towels from falling forward out when door is opened for servicing and a Nylon Rod across the center of the towel tray to dispense paper towels one at a time. Waste receptacle shall be formed, 18-gauge (1.2mm), one-piece, seamless, removable front panel with top edge hemmed. Unit equipped with trash liner holder fabricated with molded plastic trash liner holder sleeve and a 20-gauge (0.91mm), U-shaped support strap; riveted construction. Liner holder shall have an arc at front and same shape as inside of waste receptacle area. Trash Liner holder facilitates installation and removal of disposable trash liners and retains liner inside waste receptacle. Paper towel dispenser capacity to be 600 c-fold or 800 multifold paper towels. Waste receptacle capacity to be 24 L (6.3 gal). Acceptable manufacturer and product: “TRIMLINE SERIES” Semi-recess-mounted model #B-38032 by Bobrick.

END OF SECTION 10 28 13

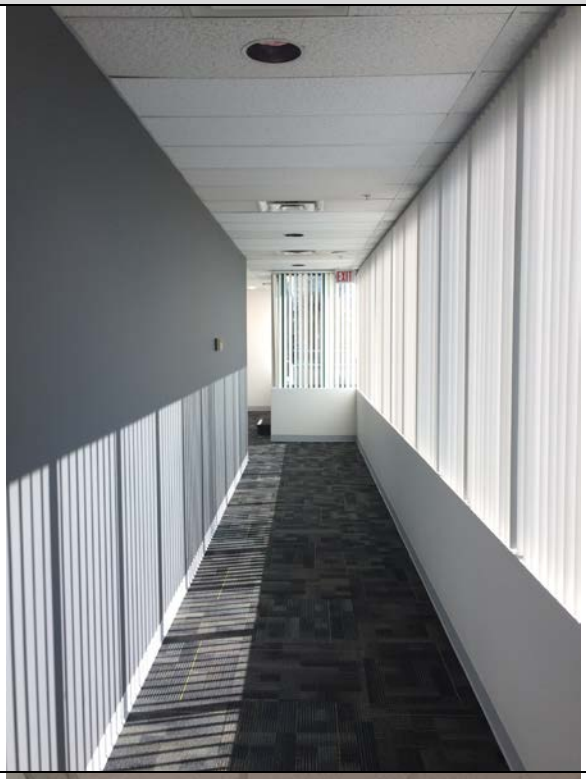
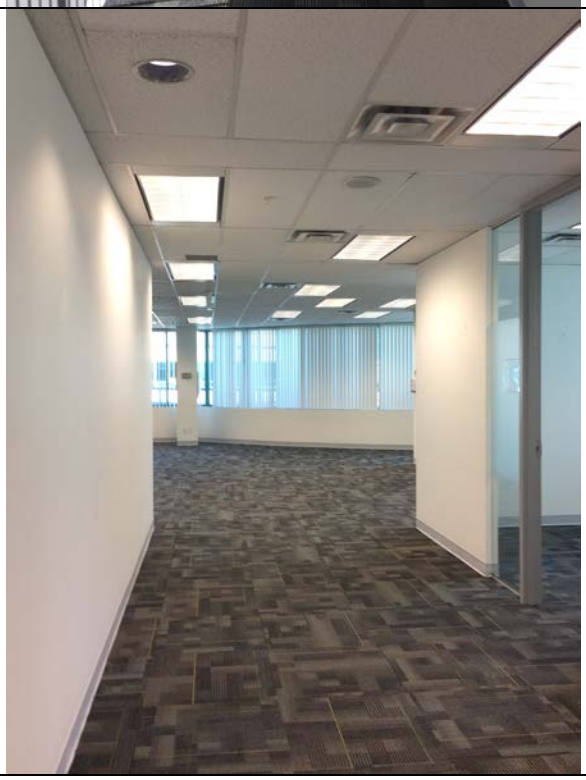
TENANT FIT - OUT FOR ECHELON CENTRE
6/F, 575 WEST 8TH AVENUE
VANCOUVER, BRITISH COLUMBIA

APPENDIX 1

SITE PHOTOS

SITE PHOTOS

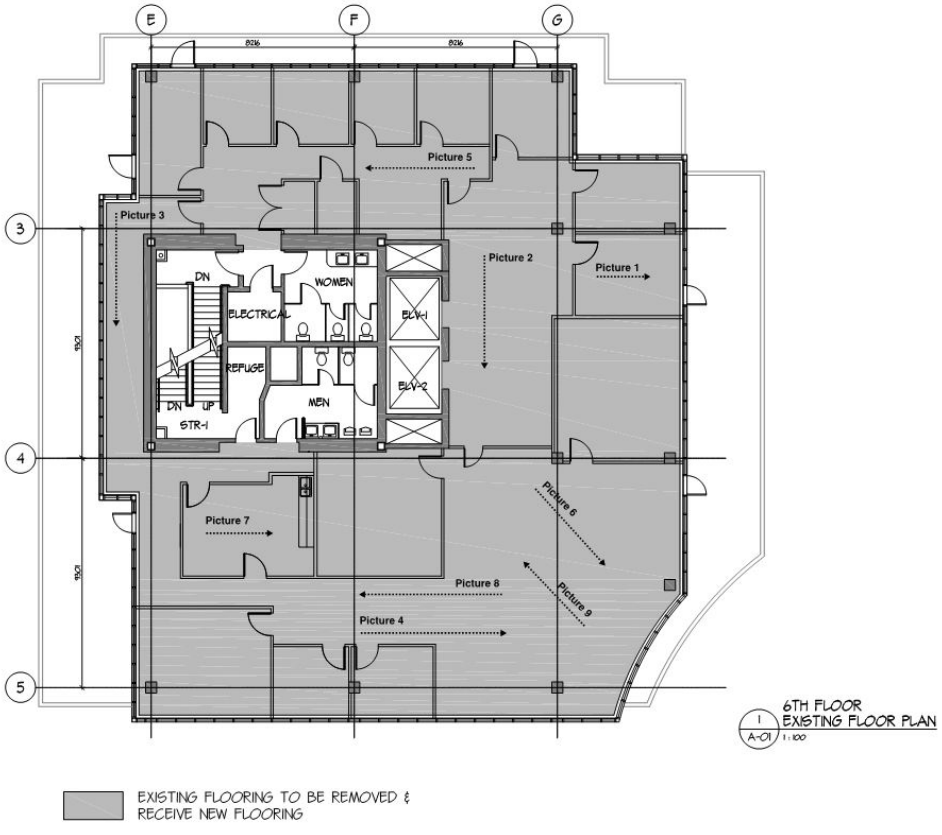
Number	Photo	Description
1		Door Patio
2		Entrance Elevator

Number	Photo	Description
3		Hallway
4		Hallway

Number	Photo	Description
5		
6		

SITE PHOTOS

Number	Photo	Description
7		Kitchen
8		Office Space

Number	Photo	Description
9		Office Space
10		Ground Floor Plan

APPENDIX 2

Echelon Centre - Tenant Design and Construction Manual

Tenant Design and Construction Manual

Echelon Centre

590, 575 & 555 West 8th Avenue
Vancouver, BC, V5Z 1C6

CRESSEY

Please recycle any version issued prior to January 2018

Contents

DISCLAIMER

While every effort has been made to ensure the accuracy of the information contained herein, Cressey (the "Landlord") assumes no responsibility for any errors, omissions, and/or revisions to this information.

This manual sets out general procedures with respect to the operation of Echelon Centre (the "Building"). The terms, covenants, and conditions contained in the lease (the "Lease") with the Landlord supersede any of the procedures set out in this manual. The general procedures may be updated and revised from time to time when deemed necessary by the Landlord.

This manual is confidential and proprietary to the Landlord. It is released solely for the purposes of communicating policies and procedures to the tenants of the Building. Copying or use for any other purpose is strictly prohibited.

INTRODUCTION

Located in the heart of the Broadway corridor in Vancouver between Cambie and Ash Streets, the Building has two towers encompassing a total area of approximately 124,000 square feet of office space.

The purpose is to assist and introduce the tenant (the "Tenant") and/or their designer, architect or contractor (the "Designer", "Architect" or "Tenant's Contractor") to the base building design, systems, contacts and opportunities inherent to the Building. Utilizing these guidelines will enable the Tenant to renovate and occupy their premises without unnecessary delays, alterations and expense.

It is intended that the high standard of design and building finishes of the Building will be carried through into the tenant improvements (the "Tenant Improvements"), and to that end, these guidelines have been prepared.

Questions concerning leases, building management and occupancy should be directed to the Landlord.

There is a strict approval process in place, and questions regarding information and/or approvals concerning planning, construction and scheduling should be directed to the Landlord.

These guidelines are to be read in conjunction with and form a part of the "Lease" document. In the event of any conflict between these guidelines and the "Lease", the provisions of the "Lease" shall prevail.

1. GENERAL

These Tenant Improvement guidelines (the "Tenant Improvement Guidelines") are prepared to assist and introduce the Tenant and/or their Architect or Tenant's Contractor to the basic building design, systems and building regulations.

The utilization of the Tenant Improvement Guidelines will enable the Tenant and his agents to avoid unnecessary delays, alterations, and expenses.

These guidelines are to be read in conjunction with the Lease. In the event of any conflict between the Tenant Improvement Guidelines and the Lease, the provisions of the Lease shall prevail.

1.1 Tenant Coordination

The principal function of the Tenant Design and Construction Manual is to guide and assist the Tenant throughout the design and construction process and to provide points of contact within the Landlord's organization and network.

The Landlord is responsible for the review of all tenant drawings and engineering drawings and provide approvals prior to the commencement of all construction. As well, the Landlord's team shall control the coordination of all Tenant and Landlord work on site.

The Landlord's team will work in conjunction with the recommended Landlord's Consultants, to ensure compliance with the building systems.

Minor changes may be indicated by amendments to existing drawings or by a diagram or written description. All changes must be reported to the Landlord's team and one of the recommended Landlord's Consultants.

Major changes involving demolition, new walls or renovations must be covered by drawings and detailed specifications, again being coordinated through the Landlord's team and the appropriate recommended Landlord's Consultant(s).

Please see Attachment 2 for a full breakdown of the move-in/move-out procedures for the Building.

The Tenant and its agents shall address all requests for information and/or approvals to:

Building Superintendent

Cres Inc.
P1 – 555 West 8th Avenue
Vancouver, B.C. V5Z 1C6
Contact: Mark Manna
Telephone: 604.710.1665
Email: echelon@shawlink.ca

Landlord

Cressey Properties Corporation
Suite 200 – 555 West 8th Avenue
Vancouver, B.C. V5Z 1C6
Contact: Tom Johnston
Telephone: 604.895.0415
Email: tjohnston@cressey.com

1.2 Landlord Consultants:

Architectural Engineer

Chernoff Thompson Architects
info@cta.bc.ca
Phone: 604-669-9460

Structural Engineer

John Bryson & Partners
www.jbp.ca
Phone: 604-685-9533
Contact: John Bryson

Electrical Engineer

Nemetz & Associates
engineers@nemetz.com
Phone: 604-736-6562
Contact: Steve Nemetz

Electrical Contractor

Ino-Tek Electric Ltd.
info@inotekelectric.com
Phone: 604-968-0696
Contact: Dave

Mechanical Engineer

MCW Consultants Ltd.
Steve Bruskiewich
mcw_van@mcw.com
Phone: 604-687-1821

Mechanical Contractors

Sundawn Integrated Services
stann@sundawn.com
Phone: 604-739-3801
Contact: Carl Best

Enviroware Projects
jtongeenvirowareprojects@gmail.com
Phone: 604-803-6895
Contact: John Tonge

Plumbing Contractor

Unique Plumbing
uniquexpert@aol.com
Phone: 604-767-4411
Contact: Ramin Ighani

Fire Protection & Sprinklers

Masters Fire Protection Services
mike@mastersfire.com
Phone: 604-417-4702
Contact: Mike Perrier RFPT

Security Systems

Secan Technologies
don@secaninc.com
Phone: 604-898-0101
Contact: Don Campbell

Surveyors

Lyon, Flynn & Collins
lyon@telus.net
Phone: 604-737-8777

Building Cleaner

NBM Group
harley@nbmltd.com
Phone: 604-294-0050
Contact: Harley Greenwood

Building Locksmith

Dutch Door Hardware Ltd.
dutchdoorhardwareltd@yahoo.com
Phone: 604-880-4187

1.3 The City of Vancouver and Regulatory Bodies

Building Permits

All drawings for Tenant Improvement work must be approved and building permits ("Building Permits") issued by the City of Vancouver (the "City") before construction can begin. The Tenant or the Tenant's Contractor or Designer is responsible for obtaining all necessary permits and approvals from the Building Department, Health Department, Fire Department and Ministry of Labour. The Tenant shall provide to the Landlord proof of Building Permits and approvals as

received from all regulatory bodies having jurisdiction, prior to commencement of the Tenant's Improvements. Any installation of items that are contrary to code will not be allowed.

Approval of such plans as outlined in this section does not waive the Tenant's responsibility to ensure that any and all Tenant Improvements meet building standards and code requirements as outlined herein with respect to design and/or construction.

Within one (1) week of the completion of all Building Permit requirements, the Tenant shall close such Building Permit and provide the Landlord with a copy of such documentation from the City.

Occupancy Permits

Tenants are responsible via the Tenant's Contractor to make arrangements for a Building Inspector to inspect their premises prior to move-in. In order to avoid unexpected delays with obtaining your Occupancy Permit, tenants are STRONGLY encouraged to apply for the Occupancy Permit at the same time as the Building Permit.
Each different use i.e. Commercial, retail, residential, industrial will require different trade inspectors to sign off on the various aspects i.e. Health, electrical, mechanical, sprinkler.
When you have arranged a date and time for the final inspection, please advise the Landlord's team as soon as possible, as they may also attend the inspection. All permits must be closed with each regulatory body and proof of such final closer shall be delivered to the Landlord.

To avoid delays with tenant move-ins', the above guidelines, as well as Attachment 2, should be followed; otherwise, move-in dates could be delayed.

The relevant and applicable authorities include, but are not limited to, those listed below. The Tenant must consider all those pertinent to the project.

City of Vancouver
Building Permits - Health Department
Fire Department

Province of British Columbia
Occupational Environment Branch
Workers' Compensation Board

Materials Testing and Certification
Underwriters Laboratories of Canada
Canada General Standards Board
Canadian Standards Association

Upon receipt of such Occupancy Permit from the City, the Tenant shall immediately provide the Landlord with a copy of such documentation from the City.

2. BASE BUILDING CONSTRUCTION

Any alterations and/or additions to the base building construction* that may be required to accommodate the Tenant's office layout shall be subject to the approval of the Landlord and the Landlord retains the right to have such alterations carried out by the Landlord's Contractor, under the supervision of the Landlord's consultants at the Tenant's expense. The cost of such work shall be borne by the Tenant and such costs may include, but are not limited to, labour, materials, applicable taxes, all architectural, engineering and contractor's fees, and such reasonable fee of supervision as the Landlord may elect to charge at its sole discretion.

* The base building construction shall consist of all the structural, mechanical systems, electrical systems, fire safety, security and architectural finishes.

3. COMMENCEMENT OF TENANT'S IMPROVEMENTS

The Tenant's Improvements (the "Tenant's Improvements") in the leased premises (the "Leased Premises") shall commence subject to the following conditions:

(a) The Tenant's final working drawings shall have been approved by the Landlord, and its consultants.

(b) The Tenant shall have obtained all necessary approvals and permits from all regulatory bodies having jurisdiction over Tenant's Improvements and evidence of all such approvals and permits shall be provided to the Landlord.

(c) The Tenant's Contractor and sub-contractor(s) (the "Sub-Contractors") shall have been approved by the Landlord prior to commencement of Tenant's Improvements.

(d) Tenant's Contractor(s) shall furnish proof of insurance as stipulated under the Tenant's Contractor requirements (the "Tenant Contractor(s) Requirements") herein.

4. TENANT DRAWING REQUIREMENTS

4.1 The Tenant's Architect/Designer

(a) The Tenant shall engage an Architect and/or a certified Designer to prepare any and all drawings which are necessary for the construction of the Tenant's Improvements and the approval of the Landlord and/or any other regulatory bodies having such jurisdiction. The Landlord may request the Tenant and/or his agent to produce additional drawings and/or information which in the Landlord's opinion may be necessary to identify and describe the nature of the intended improvements.

(b) The Tenant and/or its agent shall inform itself regarding bylaw and code requirements before preparing drawings.

(c) By giving approval to such plans, the Landlord or his consultants do not waive the Tenant's responsibility to ensure that any and all Tenant Improvements meet building standards with respect to design and/or construction.

4.2 The Approval of the Tenant Drawings

Submission of Preliminary Drawings

The Tenant and/or his agent shall submit two (2) prints of his preliminary drawings showing proposed office layout for the preliminary approval of the Landlord. Tenant preliminary drawings will be checked from the standpoint of physical compatibility and any problems encountered shall be returned to the Tenant and/or his agent for solution. Preliminary approval shall be given by the Landlord upon receipt of advice of corrections to any problems.

City Approval

Drawings will be reviewed by the City's Building Permit department and such approval for commencement of the Tenant Improvements may take more than 6 weeks.

Submission of Final Plans and Specifications

The Tenant or its agent shall submit two (2) copies of complete working drawings and specifications for final approval by the Landlord at least fifteen (15) days prior to scheduled start of work.

4.3 Tenant Drawing Parameters

The Tenant drawings shall consist of:

1. Floor Plan at 1/8" = 1'0" scale, indicate the Tenant area in relationship to the corridors, stairs, fire extinguisher, cabinets, partitions, doors, etc.

2. Telephone and Power Outlet Plan at 1/8" = 1'0" scale indicate with dimensions, location of all telephone and power outlets.

3. Reflected Ceiling Plan at 1/8" = 1'0" scale, indicate partition layout, baffles, supply air diffusers, lights, sprinklers, etc.

4. Sections at 3" = 1'0" scale, indicate partition details, baffles, doors, etc.

5. Room Finish, Door & Hardware Schedule - indicate all elements including keying which must be to building standards.

6. Mechanical Plans – prepared by the appropriate Landlord's Consultant.

7. Electrical Plans - prepared by the appropriate Landlord's Consultant.

8. General Plan Requirements:

(a) The Tenant and/or his agent shall indicate the number of persons who shall occupy each office and state the functions of each room to guideline the Landlord's consultants, especially regarding mechanical modifications.

(b) The Tenant and/or his agent are responsible for obtaining all necessary permits and approvals; such as Building Department, Health Department, Fire Marshall and Ministry of Labour. The Tenant and/or his agent shall post evidence with Landlord, proof of Building Permit and approvals as received from all regulatory bodies having jurisdiction prior to the commencement of the Tenant's Improvements, and provide the Landlord with a copy of each permit or license.

(c) The Tenant shall engage each relevant Consultant outlined in Section 1.2 to review and approve, on behalf of the Landlord, all mechanical and electrical modifications and/or additions to the base building systems to accommodate the Tenant office layout requirements. The cost of such review and approval shall be borne by the Tenant.

(d) The Tenant shall engage the Landlord's Contractors, for any mechanical and electrical modifications and/or additions all in accordance with the appropriate Landlord's Consultant's approval to ensure physical compatibility and guarantees and warranties to base building elements, unless otherwise agreed to in writing by the Landlord

(e) Tie-ins to base building mechanical systems to be performed by and/or supervised by the base building mechanical contractor and mechanical controls contractor at the Tenant's expense.

(f) The Tenant and Designer shall be responsible for the submission to the Landlord of "as is" drawings within 30 days following completion of the construction in Autocad and PDF.

5. TENANT CONTRACTOR(S) REQUIREMENTS

1. The Tenant shall engage his own Tenant Contractor(s) to execute the Tenant's Improvements.

2. The Tenant Contractor(s) are subject to the following conditions:

(a) The Tenant's ensure that the Tenant's Contractor provides a list of Sub-Contractors to the property manager for approval by the property manager, 7 days in advance of the commencement date of Tenant's Improvements.

(b) The Landlord reserves the right to approve all construction work carried out by the Tenant's Contractor(s) to ensure its compliance with approved drawings and building standards.

(c) The Tenant Contractor(s) shall be approved by the Landlord prior to the awarding of contract(s).

(d) Prior to the commencement of any work, Tenant Contractor(s) are required to the latest version of the Tenant Design and Constriction Manual and forward the following documentation to the Landlord:

- Signed Statement of Acknowledgement Attachment 1
- Insurance Certificate
- Trades list – complete with contact names & numbers (including all Sub-Contractors)
- Copy of Building Permit
- Worksafe BC Certificate
- Electronic copy of drawings (pdf and cad) and 2 hard copies
- Detailed work schedule
- Corridor & elevator lobby carpets must be protected with RAM Board

Once the project is complete, the Tenant's Contractor is required to submit final electronic Architectural, Mechanical and Electrical as-built drawings.

(e) The Tenant Contractor(s), their Sub-Contractor(s), and all construction personnel required to perform on the job site shall have labour relations affiliation compatible with that of the Landlord's Contractors or as required by law.

(f) The Tenant Contractor(s) shall be restricted to the area of Leased Premises for all work and storage of materials and equipment.

(g) The Tenant Contractor(s) shall arrange for the security of the Tenant Leased Premises and equipment, materials, etc. during the construction period.

(h) The Tenant Contractor(s) shall enforce safety regulations during the construction period.

(i) The Tenant Contractor(s) shall observe normal working hours, 7:30 a.m. to 6:00p.m., Monday to Friday, unless permission is obtained in writing from the Landlord.

(j) All noisy work such as demolition, coring, drilling, and installing track must be carried out during non-business hours and the Tenant Contractor(s) shall obtain the Landlord's approval in advance of such work.

(k) All coring and drilling must be approved in writing by the structural consultant prior to work commencing.

(l) The Tenant Contractor(s) shall provide and maintain adequate first aid and fire prevention facilities during the construction period.

(m) Air balancing report – submit to the property manager at the Tenant's cost

(n) The Tenant Contractor(s) shall give the Landlord at least twenty-four (24) hours advance notice to reserve the use of the Landlord's freight elevator for Tenant's Improvements materials and equipment. The freight elevator shall only be available for the movement of goods, materials and refuse between the hours of 9:30 - 11:30a.m. and 1:30 - 3:30 p.m. and after 6:00 p.m.

(o) The Tenant Contractor(s) shall remove all garbage and construction debris from the Tenant premises in sealed containers to a designated location. Disposal container to be supplied by the Tenant's Contractor. No construction garbage or debris is to be placed in the Landlord's garbage container.

(p) The Tenant Contractor(s) shall **NOT** penetrate or affix to the exterior wall, windows, or window frame.

(q) The Tenant Contractor(s) shall protect all finishes to basic building elements and reimburse the Landlord the cost to make good any damages.

(r) The Tenant Contractor(s) shall stack drywall over main beams at column lines. Piles not to exceed 12" in height.

(s) The Tenant's Contractors shall provide walk off mats on construction side of elevator lobbies, into common areas and stairwells.

(t) No work will be permitted on the building's fire alarm, life safety or sprinkler systems without first coordinating it through the Building Superintendent at 604-710-1665.

(u) Welding, brazing and any heat or fume producing activities are not permitted unless coordinated with the Building Superintendent.

(v) If additional security is required due to unloading facilities and elevators being used outside of normal office hours to accommodate Tenant's Contractor move-ins, such security shall be to the Tenant's account.

(w) No electrical circuits, fans or pumps are to be turned off without the prior permission of the Building Superintendent.

(x) Each Tenant shall be required to submit to the property manager at the Tenant's cost, within one month of construction completion, an air balancing report commissioned by

the heating, ventilating and air conditioning Tenant's Contractor responsible for the Tenant's Work.

5.1 Tenant's Contractor(s) Insurance

The Tenant's Contractors shall, prior to start of work, furnish evidence that they are adequately and properly covered by insurance, according to the following terms:

a) All Tenant's Contractors and Sub-Contractors, and trades of those insured, engaged in, or connected with the construction of the project are listed as additional named insureds on all policies;

b) The Tenant's Contractor must sign an indemnification agreement stating that the Tenant's Contractor or its Sub-Contractors will not place any liens against the property before the Landlord signs an "Owners/Lessees Undertaking" issued by the City.

c) A Comprehensive General Liability policy be in force covering the work, with a limit to any one occurrence of $5,000,000.00. The policy shall contain a cross liability clause and shall be extended to include non-owned automobiles and blanket contractual liability;

d) An "all risk" of physical loss or damage policy be provided covering the total contract price for the Tenant's Improvements;

e) An automobile policy must be in force covering all owned vehicles, with a minimum limit of $500,000.00;

f) All policies of insurance relating to Tenant's Improvements must be in amounts and in form and with insurers acceptable to the Landlord, including an undertaking by the insurers to give at least thirty (30) days written notice of cancellation or material changes;

g) Evidence of the existence of insurance covered referred to in this section must be submitted to the Landlord by means of a Certificate of Insurance from the Tenant's Contractor's insurers or by a certified copy of the actual policy documents before commencement of Tenant's Improvements;

h) The Tenant may, if it so wishes, provide the aforementioned insurance, but shall be bound by all the same terms and conditions as herein described.

6. RULES AND REGULATIONS DURING CONSTRUCTION

Any noise or activity which disturbs other tenants in the building, is not permitted. Failure to comply with any of regulations may result in the job being stopped/halted by the Landlord. The Landlord accepts no fault for non-performance by the Tenant's Contractor should this event occur. Strict adherence to these guidelines is mandatory.

The Landlord's team will inspect all work and has the authority to stop work where there are violations of these guidelines and/or have violations rectified at the Tenant's cost.

6.1 WorkSafeBC:

All Tenant's Contractors must follow Worksafe BC rules and regulations at all times when working at the Building. The Tenant's Contractor and his chosen Sub-Contractors will supply written evidence of good standing with WorkSafeBC.

6.2 Noise:

a) Coring, drilling and other noisy work (welding, painting equipment) is not permitted during normal business hours (7:30 a.m. to 6:00 p.m., Monday through Friday), or at times specified by the Landlord's Team. Repeated violation of this rule will result in the Tenant's Contractor being required to perform ALL work after 6:00 p.m.

b) The Tenant's Contractor shall not use "ramset," "Hilti," "Kangyo" or other explosive percussion or vibrating tools during normal business hours.

c) Welding and painting equipment will not be used during normal business hours. When such equipment is used, an isolation pad must be placed to buffer the noise. Prior to ANY hot work commencing, a "Hot Work Permit" must be obtained from the Building Superintendent.

2d) All demolition must be done after normal business hours – unless otherwise pre-approved by the Landlord.

e) There will be no external noise from radios, etc. in construction areas.

6.3 Odours:

a) Due to odours that the following materials produce, they cannot be applied during normal business hours (Monday to Friday. 7:30 a.m. to 6:00 p.m.) due to WorkSafeBC requirements: lacquers, oil based paint, enamel paints, lacquer based contact cement, carpet glues, sealers, burning equipment, gas welders, or anything that may produce noxious fumes. If there are any questions with regard to product(s) to be used, contact the Landlord's team.

b) Automotive paint sprays are not allowed.

6.4 Deliveries:

a) The Tenant's Contractor shall restrict large volume deliveries of materials and equipment to after hours (**7:30 p.m. to 6:00 a.m**.) Monday through Friday – and **anytime** on weekends. To schedule delivery times, book freight elevators, etc., call the Building Superintendent (pre-booking of freight elevators is mandatory).

b) During any after hour's delivery, it is mandatory that the loading door is not left insecure.

c) At all times, only the **freight** elevators may be used for the transportation of construction personnel and the movement of tools and materials.

d) Some form of protection must be installed from the freight elevator to the suite door during all construction deliveries on multi-tenanted floors.

6.5 Security:

a) Strict security procedures are in place. As soon as the Tenant's Contractor has been awarded the job, they should liaise with the Building Superintendent.

b) Once the Tenant's Contractor and trades have provided proper security information, they can be supplied building access cards that will allow them access to the designated area of construction. It is mandatory that identification be supplied before access cards are granted. These cards are cancelled once the job has been completed, and there will be an administrative charge for unreturned cards billed to the Tenant. For further information on this charge, please contact the Building Superintendent.

6.6 Damage and Repair:

The Tenant's Contractor is to protect base building elements during construction. They are responsible for making good all building standard finishes affected by their construction. Where encroachment beyond construction limits is necessary, they must supply and erect hoarding at the job site, the design and location of which are to be pre-approved by the Landlord's team (contact for specific requirements and approval).

6.7 Curtain Wall:

a) The Tenant's Contractor shall not penetrate or permanently fix to the exterior wall or window mullions on the curtain wall (double back tape only).

b) No materials to be stacked on induction units or against the glazing on the windows. Glazing is fitted with insulation film and any rips, tears, scratches or other damage will be repaired by the Landlord and charged to the Tenant or the Tenant's Contractor. Do not use tape on the window film.

6.8 Housekeeping:

a) The Tenant's Contractor shall keep premises clean and remove garbage daily. They must arrange with Building Cleaner for locating and storing of large refuse containers which must be located after 7:30 p.m. and removed by 6:00 a.m. the following morning. Bins are not available from the Landlord. No construction material is to be deposited into the Building compactors.

b) Prior to the commencement of construction work, floor finishes at work entrances, including elevator lobby and corridor carpets, must be protected with Ram Board – alternate spec not permitted.

c) Tenant's Contractors working on multi-tenanted floors may be charged for additional services during the term of the build out. These services would cover costs for additional cleaning to the floor, garbage removal and or extra security checks.

6.9 Waste Removal / Recycling:

a) It is mandatory for Tenant's Contractors working within the Building to recycle construction materials. Below is a list of construction materials to be recycled and the recycling facilities that accept them:

Drywall can be recycled through New West Gypsum Recycling (BC) Inc.

All **metals, steel studs, copper, aluminum, brass**, and **electrical wiring** can be recycled through Allied Salvage & Metals Ltd.

All other **construction garbage, wood, carpet, glass,** and **plastic** can be sent to one of two facilities for sorting. The sorting process takes place at either Inner-City Recycling or Ecowaste Industries Ltd. At these facilities the wood and other products are separated for possible recycling. What is left can then be taken to the City landfill.

Fluorescent lamps can be recycled through Nu-Life Industries.

b) It is the Tenant's Contractor's responsibility to ensure that they act in accordance with local and provincial environmental guidelines.

6.10 Administration:

a) At least five days **prior to the commencement of any work**, the Landlord's team must be advised of the time and date of commencement, Tenant's Contractor's name and phone number, contact names and phone numbers (including emergency number) and similar information for the Architect/designer responsible for the project.

b) It is strictly forbidden for Tenant's Contractors, Sub-Contractors and their tradespeople to ask tenants for the use of a telephone unless it is an emergency safety issue (i.e. fire, injury, smoke fumes, etc.).

c) The Tenant's Contractor(s) shall confine operations to the Leased Premises and arrange for the security of the Tenant's Leased Premises and equipment, materials, etc. during the construction period.

d) The Tenant's Contractor(s) will be responsible for any disruption to an existing tenant in the form of power outages or computer failure caused by power outages if caused by the Tenant's Contractor's negligence.

e) The Tenant's Contractor(s) will not use the washrooms on multi-tenanted floors for construction purposes, such as cleaning paintbrushes or emptying buckets.

6.11 On-Site Supervision:

All construction projects within the Building that are over 4,000 square feet will require the Tenant's Contractor to be on-site full time for the duration of the project. That failing, a superintendent/foreman must be appointed and on-site at all times to be responsible for all Sub-Contractors.

6.12 Theft:

During the construction process the Landlord will not be responsible, under any circumstances, for any loss or damage to the Tenant's materials, fixtures or equipment, whether due to Tenant's failure to properly secure the premises or for any other reason whatsoever. Also, the Landlord will not be responsible for any supplies and/or equipment belonging to the Tenant's Contractor(s) left on site at any time.

6.13 Smoking:

Smoking is forbidden in the Building and one the Property.

7. LANDLORD'S BASE BUILDING STANDARDS

7.1 Ceiling

Ceilings in typical rental areas shall be suspended T-bar system on a 5'0" x 2'0" grid with a 12" sub-grid for ceiling tile and light fixtures.

The ceiling tile is 60" x 24": 762A or 772A Armstrong Fissured Minaboard 24" x 60" X 5/8" (confirm w/ Building Superintendent before ordering).

Floor to Ceiling Heights: 2nd to 6th Floors - 8'-6" or more.

Designers should limit the use of solid ceilings due to the following:

a) difficulty with access to system components above ceiling for maintenance, repair and installation work (or install access panels at Tenant's expense for servicing);

b) type of light normally installed in such ceilings often exceeds air conditioning system capacity and hampers air distribution and temperature control;

c) limits the flexibility of the tenant located above to make changes (i.e. plumbing, floor plugs);

Ceiling access panels (minimum 2' x 2') must be installed for mechanical maintenance at the Landlord's discretion and at the Tenant's cost in solid ceilings (i.e. gypsum, metallic)

7.2 Floors

The floor shall be smooth trowelled concrete ready for finish by Tenant. A polyurethane sealer will be applied wherever the Tenant is not installing flooring.

7.3 Doors

Where a special entrance/door is required, the Landlord's team must approve the door. Tenant interior doors must comply with the City Building By-Law.

New Door Standard Suite entry doors are rated solid core – 1' ¾" x 3' 0" x 8' 6" set in a frame, 20 minute rating required. Note: All interior office doors and/or pocket doors are required to be full height.

Door Hardware – Entrance Doors – All keys must use a Schlage blank; substitutes or equivalents may not be used.

If electromagnetic locks are installed on building exit doors, they must be installed according to V.B.B.L.3.4.7.12.(16) and V.B.B.L. Bulletin 95-10 and V.B.B.L. 95-5.

All electromagnetic locks require a Building Permit and an electrical permit, and an Electrical Tenant's Contractor must install the devices. All efforts must be made to eliminate the use of electromagnetic locks. They can be a security breach, as the strikes will remain in the open position during fire alarm situations. They can remain unlocked until the system is reset, which in some instances can be hours or days if a technician is required to make repairs.

If the Tenant installs access card system for their door, it must not be tied into the base building access control system. The Tenant can chose a system which is compatible with the base building and Tenant doors.

The tenant shall by fully responsible for all cost associated with installation, maintenance and programming of their access card system.

7.5 Demising Partitions

The Landlord shall provide building standard demising partitions to delineate the Tenant's Leased Premises which shall be composed of 2 ½" steel studs, 2 ½" batt insulation fill, 1 only ½" layer of dry wall each side; taped, filled and ready for Tenant's finish.

Outside walls to lobby and exit corridor shall be 3 ½" stud with 5/8" drywall on each side and from slab to slab. Deviations will be allowed in finishes on the Tenant's side of the demising partitions, subject to the Landlord's approval and at the Tenant's expense.

7.6 Interior Walls

2 ½" steel studs on a metal track on a 16" or 24" centre with 2 ½" friction fit sound barrier insulation (R8), covered with ½" gypsum board on both sides, painted, to the T-Bar ceiling line, with a 2 ½" high rubber base.

7.6 Core Walls & Columns

Finish on core walls and columns shall be drywall ready for painting or wall covering.

7.7 Exterior Walls

Finish on exterior walls shall be drywall with paint finish.

Tenants shall not affix to or puncture the exterior drywall membrane for the installation of partitions, furniture, electrical outlets, etc.

7.8 Heating and Ventilation

a) Heating and ventilation is provided by a fan system supplying conditioned air through recessed ceiling slots.

b) Return air is through slots at the ends of the lighting fixtures into the return air plenum above the ceiling.

c) Washroom exhaust systems, located in the building core, are adequate to handle additional small local washrooms on a limited basis.

d) Final selection of locations for mounting of wall type thermostats shall suit Tenant layouts.

7.9 Fire Protection

a) The building has a full sprinkler system.

b) Statutory standpipes and fire department valves have been provided at each floor.

c) Pull stations, fire alarm speakers, smoke detectors and firefighter's telephone handset have been provided at each floor.

d) All sprinkler work must be reported to the Landlord's, so the Tenant's Contractor can be informed of the procedures.

e) No welding, cutting, soldering or brazing will be allowed, if the sprinkler system is turned off. All welding, cutting, soldering or brazing must have a trained Fire Watchman to monitor for potential fires and to ensure the fire safety procedures are followed.

f) The main sprinkler valve to each floor is hidden either within the ceiling or wall on each floor and the Building Superintendent can advise of the specific location. During construction the chain should be removed so the valve can be shut in the event of an emergency. If the valve is closed for any emergency, it should be closed within 30 seconds to prevent the building from going into full alarm. The supervisor should make all workers on the site aware of this procedure.

g) After moving any fire alarm/information speakers or devices (i.e., sensors, pull stations, firefighting phones, etc.) the entire floor must be "Re-verified" by the appropriate Landlord's Consultant. The fire alarm must be re-verified before anyone can occupy the space in any reconstructed office.

7.10 Sprinklers

a) All sprinklers must be approved by the appropriate Landlord's Consultant prior to the sprinklers being installed.

b) When part of the sprinkler system has been taken out of commission for renovation work or repairs, 72 hours notice (three business days) is required, except for emergencies. All sprinkler impairments must be done between the hours of 7:00AM - 6:00PM (Monday – Friday) or from 8:00AM – 3:00PM on weekends. It is mandatory that the sprinkler Tenant's Contractor be present for the sprinkler re-fill which can only be done after 6:00PM on weekdays. On weekends, the re-fill must be completed by 4:00PM. (For example, if you request the sprinkler impairment to be done from 8AM – noon, you must come back to the site at 6:00PM for the refill).

c) All sprinklers must be operational at all times unless they are being maintained or work is being performed on them. If at any time there is part of a system, or all of the system, that cannot be put into normal operation a fire watch must be put into effect. The appropriate fire watch will be at least one person per floor and four persons per building on patrol and in contact with the Fire Department.

7.11 Security

The entire Building goes into lockdown from 6:00 p.m. to 7:00 a.m., Monday to Friday and 24 hours on weekends and holidays. During lockdown, security clearance is required to move around the Building from floor to floor. This is obtained by contacting the Building Superintendent.

As another measure of security the stairwell doors are also locked down, excluding crossover floors. Any full-floor Tenant must be aware that stairwell entrances are locked and can be keyed to the master.

11.3. Tenant security issues can be addressed with the Building Superintendent.

7.12 Lighting

a) Typical office floor light fixtures shall be a lay-in fluorescent type to suit the 5' x 2' ceiling grid.

b) Lighting fixtures utilize a 347 Voltage supply.

c) Light tubes shall be cool white only.

d) Basic design lighting level shall be an average minimum of 70 foot candles at desk level on an open floor basis.

e) Light fixtures shall be 60" x 12" to provide maximum flexibility for location in 5' x 2' grid system. Air return shall be through the lighting fixtures.

All Typical tenant fixtures shall utilize electronic ballasts, reflectors, and 32W octron tubes as per the building standard. All Tenant office floor light fixtures are to be coordinated through the Landlord to ensure conformance with the standard building lighting.

f) The Landlord may elect to require the Tenant to install switching that provides independent lighting for areas approximating 1500 square feet (e.g. 4 switches for a Tenant area of 6000 square feet).

g) If a Tenant uses non building standard lighting within their premises the Tenant shall be responsible for their replacement.

7.13 Typical Floor Power

(a) A ceiling junction box grid system shall be provided throughout the floor areas for Tenant outlet requirements at 120/208 volt, 3 phase, 4 wire.

(b) In addition, duplex wall outlets shall be provided on certain core walls and on certain perimeter columns.

7.14 Telephone System

(a) Tenants are required to make arrangements directly with Telephone providers and/or others, for the supply and installation of telephone services to their premises.

(b) A telephone room is provided on each floor in the building core. Any additional space of this nature, which the Tenant requires for their use or equipment, must be provided within the Leased Premises. Any special cooling or ventilation required to accommodate the Tenant telephone equipment shall be provided and paid for by the Tenant.

(c) The main telephone cable entry room is located in the building parkade.

(d) Note that the telephone company will not lift or replace carpet, ceiling tile, etc., and the Tenant's Contractor must provide for this.

7.15 Structural

Unusual loading situations, such as filing rooms, safes, computer installations, etc., must be brought to the attention of the Landlord. The Landlord will not be responsible for any partitioning layout revisions necessitated by unusual loading conditions.

At the Landlord's request, and at the Tenant's expense, the Tenant shall obtain written confirmation from the building's structural consultant regarding any unusual loading conditions.

7.16 Mail Box

The building mail box is located on Parking Level 1.

7.17 Tenant Signage

(a) A building standard identification sign for Tenant's entrance door shall be provided by the Landlord at Tenant's expense.

(b) Tenant identification shall be provided in the main floor lobby directory and their floor lobby directory by the Landlord at Tenant's cost.

(c) All Tenant's signage must be approved by the Landlord before installation.

7.18 Exterior Window Coverings

The Landlord shall provide base building curtains. No other type of exterior window covering will be permitted without the Landlord's prior written consent.

8. TENANT CONSTRUCTION STANDARDS

8.1 Interior Partitions

The Tenant shall install a partition composed on 2 ½" steel studs at 16" O.C. with Batt insulation to full stud depth and ½" drywall each side - taped, filled and painted, as minimum standard. Top track of all partitions are to be installed with the use of clips and not screw mounted.

8.2 Interior Doors

The Tenant shall install solid core wood full height doors. Variations to suit individual decor shall be subject to Landlord's approval.

8.3 Locks

Tenants requiring locksets to any offices within the Leased Premises shall ensure the lockset will receive a Sargent cylinder with keys coded to the building's master-key system. The Tenant's designer shall note on the required hardware schedule the appropriate designations for interior locksets and keying requirements, subject to the Landlord's approval.

8.4 Power

(a) All power shall originate form circuits in panels on the Tenant floor.

(b) Extra 120/208 volt, 3 phase, 4 wire power other than that provided through the ceiling junction box system shall be installed if available, at Tenant's expense.

8.5 Copying Machines

Copying machines must be non-toxic type and will usually require special circuitry and power hook-up. Because of the heat, etc., generated by these types of equipment, an exhaust duct may be required from the room to the building exhaust shaft. The Tenant shall advise and provide specifications of copying machines.

8.6 Coffee Machines & Water

Coffee machines usually require special circuitry and power hook-up. The Tenant shall advise and provide specifications. If additional appliances are installed, separate dedicated circuits should be provided. Backflows and filters shall be maintained regularly by the Tenant.

8.7 Light Switches

Heat dissipating dimmer switches must not be located below thermostats. Where a local light switch is desirable to a private office or boardroom, the Tenant shall advise and specify.

8.8 Pot and Track Lights

In order to conserve energy, Tenants will be permitted to install incandescent pot or track lights to a maximum average of 0.4 watts per square foot of the Leased Premises. All such lights shall be controlled by local switching.

8.9 Tenant Construction Clean-up

Upon completion of the Tenant's improvements and before occupancy, the Tenant's Contractor(s) shall thoroughly vacuum and clean up the Leased Premises, windows (interior only), repair damaged ceiling tiles, walls, ceilings, elevator, building systems and any other parts of the building effected by Tenant's Improvements.

The Landlord recommends the use of the Building Cleaner in Section 1.2 to ensure physical compatibility of cleaning materials and standards.

8.10 Air Balancing

Each Tenant shall be required to submit to the Landlord at the Tenant's cost, within one month of construction completion, an air balancing report commissioned by the heating, ventilating and air conditioning Tenant's Contractor responsible for the Tenant's Improvements.

9. INTERIOR DESIGN GUIDE

Tenant's Designer(s) are urged to take maximum advantage of the basic building and its systems to avoid expense and delay to Tenants when creating their improvements and restoring them at the termination of the Tenant's Lease.

This is intended as a guide to Tenant and their Designers and Tenant Contractor(s):

a) Do take full advantage of the 5' x 2' grid to which the ceiling is built and the 12" sub-grid of ceiling tile and light fixtures.
b) Do keep ceiling at standard height.
c) Do not request changes to the partitions, doors, ceiling heights or finishes in the rooms in the core (i.e. male and female toilets, vestibules, stairs janitor, electrical and telephone closets).

d) Do ensure that any wall finishing material introduced by a full-floor tenant in the elevator lobby does not require changes to the elevator door frames, call buttons or signals.
e) Cladding of door frames with special approved finishes will be permitted to full-floor tenants.
f) Do ensure that any floor finish material introduced by a full-floor tenant in the elevator lobby does not require changes to the elevator door thresholds.
g) Do locate additional washrooms, sinks, etc., as close as possible to the soil stacks to ensure adequate slope of drains.
h) Do advise Landlord as soon as possible, and in writing, of any changes required to the base building elements.
i) Do not permit the filling of holes in the aluminum frames of the windows.
j) Do arrange for air return openings in every sound baffle in ceiling plenum above a partition, to permit return of air through the ceiling space to the return air ducts at the core.
k) Do comply with City regulations, with respect to access to Fire Department valve cabinets and acceptable routing through the Tenant premises for persons with hose and maximum distance of water throw.

10. SUSTAINABLE TENANT DESIGN

The Landlord supports and encourages sustainable design in the buildings we operate. Sustainable-design offers a host of advantages to office tenants including a reduction in their operating costs, a healthier workplace for their staff as well as improving the environment with the right choices for materials and office equipment. It is now easier than ever to make sure that your office renovations have as little negative impact on the environment as possible, while providing a more comfortable place to work.

Here are some things to consider before starting your renovation:

Hire Designers, Engineers, and Tenant Contractor(s) that are knowledgeable about sustainable design and construction practices. One good place to start is the Canada Green Building Council's website where they have a directory of accredited professionals' expert in sustainable design/construction (www.cagbc.org).

Install low VOC (Volatile Organic Compounds) materials. Make environmentally conscious choices when selecting carpets, adhesives, paints, finishes, sealants and composite wood products.

Incorporate sunlight and access to views in the design of the space so all of your employees reap the benefits. day-lighting, or allowing abundant natural light indoors, enhances interior light quality and reduces energy demands. The use of glass in sustainable-design office space should be selected with consideration given to visible light transmittance, heat loss and gain, ultraviolet ray transmittance, and color. The use of high-performance glazing systems in the design of

interior or private office placement admits more light while simultaneously rejecting a higher percentage of solar heat gain, resulting in better day-lighting and reduced cooling loads.

Insist that Tenant's Contractors recycle as much construction waste as possible. Did you know that Tenant's Contractors can recycle concrete, metal, glass, wood drywall, plastics and even packaging waste? Demolition and construction waste accounts for over 30% of total waste sent to landfills. Recycling construction waste can also be less expensive than sending waste to the land fill, as tipping charges are much lower at recycling depots than landfills.

Install materials with high recycled content. Building construction accounts for over 40% of raw materials used globally. By using materials with a high recycled content, you are reducing the need for raw material extraction and reducing the amount of waste that ends up in a landfill. Again, materials with a high recycled content are becoming readily available at little or no additional cost.

Take stock of what you already have. Is there something in your existing space that could be reused or adapted in your new space?

Save energy! Put occupancy sensors and/or light switches in rooms that aren't constantly used (kitchens, supply rooms, meeting rooms) so the lights automatically shut off when staff aren't around. Minimize or eliminate specialty lighting. Advances in lamp, ballast, and fixture technology produce more light with less energy. Good lighting design uses as little as 0.5 to 0.75 1P watts per sq. ft. of floor space, compared to lighting loads of 2.5 to 3 watts in traditional office design. Furthermore, sensors that measure indoor light levels can raise and lower artificial lighting in response to changing outdoor conditions, and occupancy sensors turn lights off when not needed.

Ventilation systems. Tenant design should take into consideration improved ventilation with well-designed mechanical and electrical systems to deliver air-flow effectiveness, provide plentiful fresh air, and reduce exposure to bio-contaminants such as microbial diseases, fungi, and moulds. High-efficiency filtration systems are very effective in reducing air quality. Improved ventilation also removes indoor pollutants generated by the off-gassing of materials such as carpet, adhesives, sealants, furniture coverings, and paints and varnishes, as well as reduces carbon dioxide levels.

Reduce water use. Many cost-effective options can reduce water use by up to 30 percent. Toilets now use 1.6 gallons per flush versus 3 to 5 gallons per flush on older models. Sensor-operated faucets and urinals help save water and improve sanitary conditions.

Materials Selection. Building and finish materials should be selected with regard to renewability, recycled content, manufacturing processes, packaging, and shipping (i.e., using materials that are locally manufactured or harvested). Sustainable-design practices also incorporate less-toxic premises materials and furnishings. Carpets and floors, paints, varnishes, furniture, and other materials should be carefully and researched prior to specification. Life-cycle cost analysis of materials should also be conducted to compare not only a system or material's first cost but also to consider its cost over the building's entire life span. An increase in the manufacturing of such products has reduced their costs while increasing selection and quality.

Sustainable Tenant Design: The Bottom Line

Sustainable design does not come from employing piecemeal changes that create minor reductions in resource use and total life-cycle costs. Tenants can benefit the most from sustainable design if they work with qualified designers, construction managers and building management to take a holistic approach to planning, designing, and construction of their space. Simultaneously considering design, construction, and interlinked issues, such the building electrical/mechanical and lighting systems optimizes all aspects of a project. In the end, an integrated approach often creates multiple benefits for both the building Landlord and the Tenant.

ATTACHMENT 1

Statement of Acknowledgement

I acknowledge that I have received, read and will abide by the **2018** version of the **Echelon Centre Construction Manual** and confirm that I will abide by the rules and regulations governed by the Construction Guidelines.

_____
(Date)

_____
(Print Company Name)

_____
(Print Name)

_____
(Signature)

ATTACHMENT 2

Move In/Move Out Procedures

On all move-ins and move-outs, please give at least 3 weeks prior notice to the Building Superintendent's office prior to your moving date so that arrangements can be established. We will be pleased to discuss the details of any move with your moving company representative.

Loading and Unloading Requirements

(a) It is the policy of the Landlord that moves should be carried out on business days, between the hours of 8:45 a.m. and/or 1:30 p.m. to 4:30 p.m. If circumstances are such that this is not possible, permission may be granted provided security coverage is arranged through the Building Superintendent's office. Any charges incurred for this security service are chargeable to the Tenant.

(b) The loading bay is located at the rear of the Building, an Elevator will be allocated to moving companies and a key supplied. Moving of materials and/or furniture through the ground floor lobby is strictly prohibited.

(c) Protective curtains for the elevator are available through prior arrangements with the Building Superintendent's office and must be installed before materials are moved. Installation and removal will be the responsibility of the moving company.

(d) At the completion of each day, all cartons, crates, wrappings, and waste shall be removed from the building, through arrangements made by the Tenant. The Premises, streets and sidewalks should be kept clear of debris caused by the move.

(e) The Tenant is liable to the Landlord for replacement or repair of any damages incurred to the Building property during a move. This includes, but is not limited to, damage to the loading zone, elevators and corridors. Tenants should ensure that its moving company carries adequate insurance coverage to cover damages. Billing for damages will be made directly to the Tenant, not to the Tenant's Contractor.

(f) All interior surfaces exposed to possible damage as a result of the move, such as, carpets, floor finishes and wall coverings, shall be adequately protected.

(g) Upon completion of the move and removal of the debris caused by the move, the Building Cleaner will clean the areas of the building affected by the move. Cost of this cleaning will be billed to the Tenant as a tenant cost.

Please contact the Building Superintendent to make arrangements with respect to the move or to obtain further information.

For information, please contact the Building Superintendent

APPENDIX 3

Hazmat Report

1. Asbestos Materials Survey & Risk Assessment
2. Crystaline Silica Swp & Ecp

ASBESTOS MATERIALS SURVEY & RISK ASSESSMENT

OF

'**ECHELON**'

555/575 West 8th. Ave,

Vancouver BC

PREPARED FOR:

Cressey Development Group

#800 – 925 West Georgia Street

Vancouver, BC

V6C 3L2

PREPARED BY:

Marc P. DiMarco

H&S Manager (A.B.I./AHERA)

1. EXECUTIVE SUMMARY

This building survey included a complete walkthrough and physical assessment of all common areas and functional spaces, accessible storage areas, mechanical rooms, boiler rooms, telephone rooms, parking structures and a select number of representative commercial suites within each subject property. The representative suites were limited to those that were vacant at the time of sampling and a few occupied suites. Exclusions from this assessment include rooftop and associated rooftop building materials.

It should be noted that structural, mechanical and architectural drawings were issued for construction in 1991; as such, WorksafeBC and AHERA have advised that buildings constructed prior to 1990, shall be tested for hazardous materials and their inventories kept current. It must be noted that due to the age of the Echelon buildings, not all materials are required to be tested.

This risk assessment has been conducted in compliance with OHSR 20.112, under AHERA, to prevent accidental disturbances to ACMs by workers who may impact the materials during work activities, tenants in common areas and sub-trades.

The objective of this assessment was to identify the types, conditions and extent of ACMs, their friability and potential for disturbance. Photographs taken during this assessment are included in Appendix A of this report.

The assessment was conducted using both visual and physical assessment techniques as sanctioned by WSBC and AHERA. Representative sample data of suspected ACM materials is located in Appendix B of this report.

In summary, the findings from this assessment conclude that NO Asbestos Containing Materials exist in any of the Surfacing Materials or Thermal Systems of this building; however it should be noted, that several “miscellaneous” materials have been recorded as “unknown.”

This survey was conducted using non-destructive to minor-destructive testing methods, due to occupancy in functional spaces at the time of the assessment. Areas within walls, above t-bar ceiling and acoustic tiles was inspected where access was possible.

2.0 INTRODUCTION

This survey was conducted on 11/25/2013 (Updated on 07/03/2014) by Marc P. DiMarco, Health & Safety Manager at Cressey Development Group. Marc DiMarco is a licensed AHERA building inspector.

Representative bulk samples collected and analysed using PLM methodology under NIOSH, are included in Appendix C of this report. This document also provides information on the potential level of hazards that may or may not exist at this property.

3.0 METHODOLOGY

The US EPA Guideline document for Controlling Asbestos Containing Materials in Buildings was selected for use in this risk assessment. The document identifies factors associated with the “condition” and “potential for disturbance” of ACMs. These factors help in defining the friability and potential for fiber release of ACMs.

This survey relied on the abilities and experience of the inspector to identify possible ACMs. Exclusions from this assessment are limited to rooftop areas.

4.0 RESULTS & ASSOCIATED RISK LEVELS

No Asbestos containing materials were recorded or observed during the assessment of this building.

4.1 Surfacing Materials –

Homogeneous sampling groups in functional areas included a) acoustic ceiling tiles, b) drywall, c) DWJC (drywall joint compound).

Variations in consistency, patterns, texture application and thickness were noted, though no significant damage.

DWJC was sampled extensively and no ACMs were detected.

4.2 Ceiling and Wall Textures (SMs)

None of the ceiling or wall textures in this building are considered to be ACMs.

4.3 Mechanical Pipe Insulation - (TSIs)

Insulating pipe materials in the boiler rooms, telephone rooms and mechanical rooms of this building were found to be fibreglass, with no mudded pipe elbows or fittings.

4.4 Underground Parking Spray Insulation –

White ceiling spray (sound dampener) was observed in the underground parking area of this subject property. The materials are presumed to contain cellulose fibre and not ACM.

4.5 Ceiling Tiles –

2x4 acoustic ceiling tiles were sampled by ACM labs in 2013 and were found to be negative for ACM.

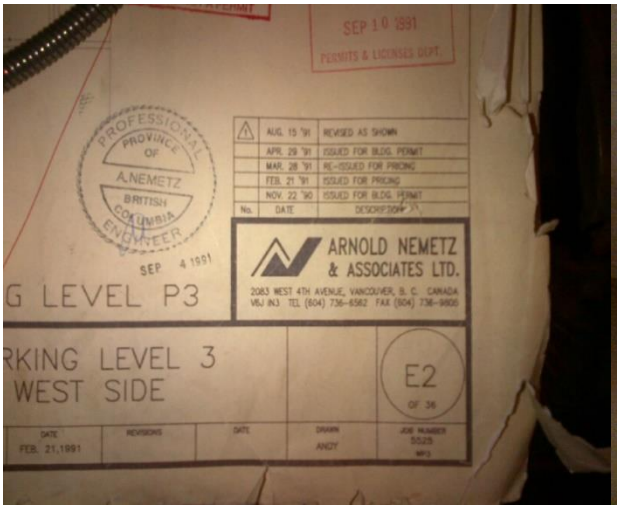
4.6 Glazing Mastics –

Because of the “as-built” date of drawings and the facility, it is assumed that no ACMs were used in the glazing mastics as applied.

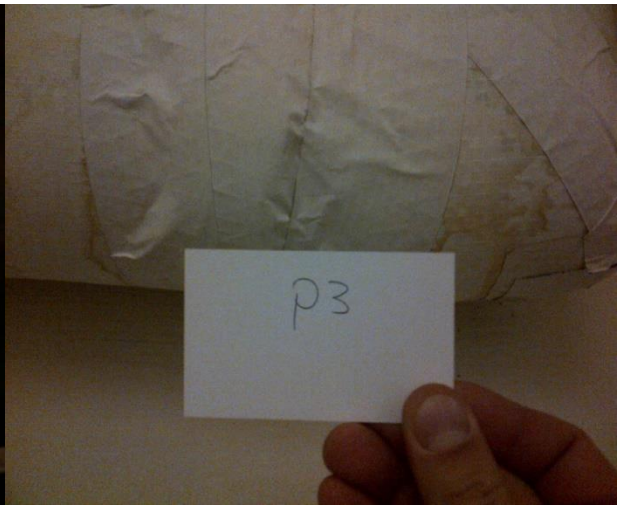
5.0 RECCOMENDATIONS

As a result of the findings discussed in previous sections of this assessment, it can be concluded that NO associated risks of asbestos contamination exists at this property location.

APPENDIX A – SITE PHOTOS



Issued for Construction



Thermal System HVAC Pipe Wrap

Hot Water Supply / Return

Domestic Cold Water

555 – Floor 2 (Above ceiling space) DWJC and Fire-Stop

Functional Space – Homogenous Acoustic Ceiling Tile (common hallways)

CRYSTALINE SILICA SWP & ECP

(Operating Locations)

Table of Contents

Purpose of the ECP

The purpose of this exposure control plan is to set out our approach to protecting workers, tenants and visitors to our operating locations from harmful exposure to airborne silica dust.

We have a duty to protect our workers from silica exposure on our worksites, and we do so by embracing the ALARA philosophy when it comes to exposure levels: "As Low As Reasonably Achievable."

Studies show that maintenance and construction work tasks involving disturbances to Silica can create a lot of dust. This dust may generate airborne silica in levels above what is deemed to be safe. Therefore, effective controls are available to protect workers from harmful exposure.

A combination of these control measures will be required to achieve this objective. We commit to being diligent and up-to-date in our efforts to select the most effective control technologies available, and to ensure that the best practices as described in this ECP are followed at our worksites and operating locations.

Responsibilities

Due to the risk posed by silica dust, all key-personnel involved in the daily maintenance of our operating locations, must take specific action to ensure that as much as possible, a hazard is not created.

As the Employer, we are responsible for:

- Ensuring that the materials (e.g., tools, equipment, personal protective equipment) and other resources (i.e., worker training materials) required to fully implement and maintain this exposure control plan (ECP) are readily available where and when they are required.
- Providing a job-specific ECP, which outlines in detail the work methods and practices that will be followed on each site. Considerations will include:
  - Availability and delivery of all required tools/equipment
  - Scope and nature of disruptive work to be conducted
  - Control methods to be used

  - Level of respiratory protection required
  - Coordination plan
- Conducting a periodic review of the effectiveness of the ECP. This would include a review of the available dust-control technologies to ensure these are selected and used when practical.
- Initiating sampling of worker exposure to concrete dust when there are non-standard work practices for which the control methods to be used have not been proven to be adequately protective.
- Ensuring that all required tools, equipment, and personal protective equipment are readily available and used as required by the ECP.
- Ensuring supervisors and workers are educated and trained to an acceptable level of competency.
- Maintaining records of training, fit-test results, crew talks, and inspections (equipment, PPE, work methods/practices).

The supervisor (Building Superintendent) is responsible for

- Obtaining a copy of the ECP from the employer, and making it available at the worksite to their workers
- Selecting, implementing, and documenting the appropriate site-specific control measures
- Providing adequate instruction to workers on the hazards of working with silica-containing materials (e.g., concrete or spray-applied acrylic dryfall) and on the precautions specified in the job-specific plan covering hazards at the location
- Ensuring that workers are using the proper respirators (if required) and have been fit-tested, and that the results are recorded
- Directing the work in a manner that ensures the risk to workers, tenants and the public is minimized and adequately controlled according to the ALARA philosophy
- Communicating with sub-contractors to ensure a safe work environment

The worker is responsible for

- Knowing the hazards of silica dust exposure
- Using the assigned protective equipment in an effective and compliant manner
- Setting up the operation in accordance with the site-specific plan
- Following established work procedures as directed by the supervisor or H&S Manager
- Reporting any unsafe conditions or acts to the supervisor or H&S Manager
- Knowing how and when to report exposure incidents

Risk identification, assessment, and control

Risk identification and assessment

- *Work activities that may generate airborne silica dust*—For silica, the route of exposure is through the inhalation of airborne dust. The employer should have a qualified person review the planned work activities to identify those that may generate airborne silica.
- *Identify workers at risk of exposure*—For example, workers who finish concrete would be at greater risk of exposure than plumbers or electrical workers.
- *Amount of exposure*—Some work activities generate more dust than others, and the amount of exposure should be estimated. Published resources are available that provide air sampling data and compare silica dust levels from various construction activities.
- *Duration of exposure*—Workers who grind concrete for a full shift would be at greater risk than workers jackhammering for an hour.

Worker exposure measurements

The Occupational Health and Safety Regulation lists an occupational exposure limit (OEL) for respirable crystalline silica (including quartz) of 0.025 milligrams per cubic meter (mg/m^3). This is a concentration to which nearly all workers could be exposed for eight hours a day, five days a week, without adverse health effects. However, as a suspected carcinogen, crystalline silica is also an ALARA substance, and exposures must be reduced to levels **a**s **l**ow **a**s **r**easonably **a**chievable below the OEL (occupational exposure limits).

Studies show that when construction work tasks involving the drilling, disturbing, chipping, grinding, cutting, and sawing of concrete and concrete products (or silica containing acrylic dryfall)are conducted without using effective dust controls, workers can be exposed to airborne silica concentrations at levels far above the OEL.

Risk control options (see OHSR 5.55, Type of controls)

Effective control options must be used to eliminate or reduce the risk to workers from the hazards of silica dust exposure. The following hierarchy of control measures must be followed:

- Elimination/substitution (e.g., using products with less silica or using work methods that would eliminate the need for surface cutting/disturbing/grinding)
- Engineering controls (e.g., water, local exhaust ventilation, enclosure)
- Administrative controls (e.g., coordination of tasks with subcontractors, signage)
- Personal protective equipment (e.g., coveralls, respiratory protection)

Control Methods

We are committed to developing knowledge and expertise about these controls and to establishing policies/procedures to protect workers from harmful exposure and to minimize reliance on respirators. Effective engineering controls such as HEPA vacuum attachments and wetting methods, which control silica dust at its source, are readily available. These controls have been proven to reduce airborne dust levels significantly when selected and operated in accordance with best practices. We know that engineering controls alone do not reduce airborne silica to safe levels; so in most cases other control measures, including respiratory protection for the worker, will be necessary.

The Occupational Health and Safety Regulation directs us to use the best control technology available for the task and circumstance. If we take on a job that could release an unusually high amount of dust, and we are unsure of the adequacy of our control measures, we will conduct air sampling in order to ensure that control methods are protective.

We will reduce or eliminate worker exposure to silica dust by selecting a combination of the following controls listed in order of preference:
1. Elimination and substitution
2. Engineering
3. Administrative
4. Personal protective equipment

Elimination and substitution

We recognize the importance of planning the work in order to minimize the amount of silica dust generated.
- During the project planning phase, we will advocate for the use of methods that reduce the need for cutting, grinding, disturbing or drilling of concrete surfaces or spray applied, silica containing acrylic dryfall.
- Whenever possible, we will schedule work when work area can be wetted, because we know that much less dust is released at that time.

Engineering control of dust

Our dust control systems may employ three well-established techniques:
- Local exhaust ventilation (LEV)
- Wet dust suppression (WDS)
- Restricting or isolating the work activity with barriers or full enclosures (this may be the only option where LEV or WDS is not practical or effective)

Local exhaust ventilation (LEV)—safe work practices

When LEV is used in our work, we will employ the following systems and safe work practices:

- Vacuum attachment systems to capture and control the dust at its source whenever possible.
- Dust control systems (used regularly and well maintained).
- HEPA or good quality, multi-stage vacuum units approved for use with silica dust. [The vacuum units should be capable of creating a target airflow of at least 70 cfm. This should achieve a face velocity at the shroud of about 1.3 m/s (260 fpm)—the higher the face velocity, the more dust captured at source.]
- Work planning, so that work can be completed when wet (dust release can be significantly reduced).
- Good housekeeping work practices (for example, use vacuums with high-efficiency particulate air (HEPA) filters, or use wet sweeping).
- Train workers and supervisors on how to properly use and maintain the equipment.

Wet methods for dust control—safe work practices

Water spray systems

These systems are designed to apply water to the surface to wet the surface and prevent the resulting dust from becoming airborne. Many construction tools/equipment types can be purchased with wet spray attachments. Water can also be manually applied to the surface before and during the work (grinding, drilling, cutting, etc).

A drawback to this method of dust control is that the dust is not collected—the wet slurry must be cleaned up so that the dust does not dry and become airborne.

Barriers and enclosures—safe work practices

Barriers / Enclosures
Barriers (if/when required) are used to isolate the work area from the rest of the project and to prevent entry by unauthorized workers. They do not prevent dust drift and should only be used where natural ventilation is sufficient and dust release is controlled.
Enclosures (if/when required) can contain a dusty atmosphere. They can consist of a partial structure (poly draping or partial plywood hoarding) or a full enclosure equipped with some capacity for maintaining a lower than ambient pressure inside (negative pressure). For partial enclosures, airflow in the enclosure could be created by setting up a ventilating (blower) fan where the dusty air would be discharged to an unoccupied outdoor location. This option should only be used when dust levels are low or to supplement LEV or wet methods such as in stairwells.

Administrative controls

Administrative controls involve activities that are not directly related to the actual physical work, but are important strategies to support the exposure control plan and ensure that all workers are protected from exposure to silica dust. Examples of administrative controls include

- Posting warning signs (if/when required)
- Rescheduling disturbing the silica containing substance at different times than other work
- Relocating unprotected workers away from dusty work

We will follow these safe work practices:

- Exposure control plans and the site risk assessment/workplan will be submitted to the H&S Manager prior to the start of work.
- We will establish procedures for housekeeping, restricting work areas, personal hygiene, worker training, and supervision.
- As part of our project planning, we will assess when silica dust may be generated and plan ahead to eliminate or control the dust at the source. We recognize that awareness and planning are key factors in the prevention of silicosis.
- Warning signs will be posted to warn workers about the hazards of silica and to specify any protective equipment required (for example, respirators).
- Work schedules will be posted at the boundaries of work areas contaminated with silica dust.
- Work that generates silica dust will be conducted after hours, when access to other unprotected workers cannot be restricted.

Personal protective equipment

Respirators

- Respirators should not be relied on as a primary means of preventing or minimizing exposure to silica dust.
- Select respiratory protective equipment (RPE) very carefully, as different types can give widely varying levels of protection. Employers may be able to rely on available exposure data to select the appropriate respiratory protection. Improper selection can result in serious worker exposure.
- A review of several research reports indicates that when effective engineering controls (e.g., LEV and wet methods) are used, a half-face air purifying respirator may be adequate to protect workers from harmful exposure to silica dust.

Respiratory protection

- All workers who wear respirators will do so in adherence with our respirator program.
- Respiratory protection will be selected based upon the site-specific risk assessment.
- Only NIOSH-approved respirators will be used.
- Workers who wear respirators will be clean-shaven. Filtering face-piece respirators give little or no protection to workers with beards, and even a minor growth of stubble can severely reduce the effectiveness of respiratory protection.
- All workers who wear respirators will be fit-tested.
- Workers will be properly trained in the use of respirators, and a high standard of supervision, inspection, and maintenance will be followed.

Protective clothing (PPE)

Workers will wear protective clothing as specified in our task-specific safe work procedures to prevent contamination of worker clothing. Workers will not use compressed air to clean themselves, their clothing, or their equipment.

Education and training

We will ensure that workers are informed about the contents of the ECP and are provided with adequate education and training to work safely with and around materials that contain silica.

We will train all workers potentially exposed to airborne silica dust in the following:

- Hazards associated with exposure to silica dust
- The risks of exposure to silica
- Signs and symptoms of silica disease
- Safe work procedures to be followed (e.g., setup of enclosures, disposal of silica waste, personal decontamination)
- Use of respirators and other personal protective equipment (e.g., wearing of personal protective equipment, and cleaning and maintenance of respirators)
- Use of control systems (e.g., LEV and wet methods)
- How to seek first aid (for example, the location and use of eyewash stations)
- How to report an exposure to silica dust

Records of training will be kept, as specified in the Occupational Health and Safety Regulation.

Documentation

Records will be kept of the following:

- All workers who are exposed to respirable silica dust while on the job
- Worker education and training sessions
- Respirator fit-testing
- Equipment maintenance and repair
- Worksite inspections

The exposure control plan will be reviewed at least annually and updated as necessary by the employer, in consultation with the workplace health and safety committee or the H&S Manager.

Appendix B: Sample site-specific exposure control plan forms

SILICA DUST EXPOSURE CONTROL PLAN

Date control plan completed:			
Prime contractor:		Superintendent:	
Project manager:		CSO/First aid attendant:	
Project:	Address:		
Company completing work:			
Address:		Contact:	
Contact phone:		Contact fax:	
On-site supervisor(s):			
Worker(s):			
Scope of work to be completed:			
Work start date:		Duration: ☐ Days ☐ Months ☐ Years	
Employer responsible for:			
Supervisor responsible for:			
Worker responsible for:			

HAZARDS IDENTIFIED (other than silica dust)	**CONTROL MEASURE(S)**
☐ Falls	
☐ Slipping	
☐ Confined space	
☐ Workers above	
☐ Workers below	
☐ Noise	
☐ Electrical	

Overview of work procedure (How are you going to work safely?):

Workers trained in (training records must be available for review):			
Proper use of grinding equipment	Y☐ N☐	Proper use of admin controls	Y☐ N☐
Proper use of engineering controls	Y☐ N☐	Proper use of PPE	Y☐ N☐
Proper disposal methods	Y☐ N☐	Other (fall protection, swing stages, etc)	Y☐ N☐

Respirators (Refer to ECP for respirator requirements)		
Required: Y☐ N☐	Available: Y☐ N☐	Fit-tested: Y☐ N☐

PPE required for scope of work (other than respirator)

☐ Coveralls ☐ Gloves ☐ Rubber boots ☐ Eye protection ☐ Reflective vest ☐ Hearing protection

Documents to be attached to control plan (☑ if present)

☐ Exposure control program ☐ Respiratory protection program ☐ Training records ☐ SWP (tools and equipment)

SILICA DUST EXPOSURE CONTROL PLAN

Project management signature	Position:	Date:
Contractor supervisor signature	Position:	Date:

Task/risk management matrix (relating to silica dust) use table 1 for codes, separate with a comma (,)

#	Date/Duration		Task	Controls		PPE	Supplies/ Equipment
				Engineering	Administrative		

Notes (For task/risk management matrix above. Use # to indicate which task the note relates to.)

SITE INSPECTION CHECKLIST (complete pre-work & periodically during project)

Engineering controls		Problem noted (DETAIL)	Problem corrected (DETAIL)
Available at site	Y☐ N☐		
Operating correctly	Y☐ N☐		
Used appropriately	Y☐ N☐		
Effective in dust control	Y☐ N☐		
Administrative controls			
Available at site	Y☐ N☐		
Used appropriately	Y☐ N☐		
In place before work start	Y☐ N☐		
Effective	Y☐ N☐		
Cleanup			
Vacuum used properly	Y☐ N☐		
Large pieces picked up	Y☐ N☐		
Vacuum capacity maintained	Y☐ N☐		
Pre-filters in place	Y☐ N☐		
Vacuum attachments used	Y☐ N☐		
Collection bags in place	Y☐ N☐		
Waste properly disposed of	Y☐ N☐		

TABLE 1 (Codes for task/risk management matrix)

Engineering controls		Administrative controls		PPE		Supplies/Equipment	
1	Exhaust fan	1	Signage	1	Respirator	1	Hand grinder
2	LEV	2	After hours work	2	Gloves	2	Ceiling grinder
3	Wetting	3	Scheduling	3	Coveralls	3	Floor grinder
4	Partial enclosure			4	Hearing protection	4	Disposal bags
5	Full enclosure			5	Eye protection	5	HEPA filter (vacuum)
6	Shroud			6	Reflective vest	6	HEPA filter (respirator)
7	Barriers			7	Rubber boots (CSA)	7	Shovel
				8	Fall arrest	8	Lifeline

Site-specific silica exposure control plan

Location: _____ **Date:** _____

Work description:

Primary silica control options (check those options used and explain use if needed)

♦ Substitution controls (using procedures or products that do not create silica; must review MSDSs)

Other means of demo: _____

Different products: _____

Other substitutions: _____

♦ Engineering controls (when using ventilation, draw air out and don't expose others to exhaust dusts)

Vacuuming: _____

Wetting: _____

Ventilation: _____

Isolation: _____

Other means: _____

♦ Administration controls (reducing exposure by work schedules, timing, or planning options)

Control points: _____

Work schedule: _____

Other means: _____

Secondary silica control options (check those options used and explain use if needed)

♦ Personal protective equipment

Half-mask respirators: _____ Cartridge type: _____ Fit tests confirmed: _____

Full-face respirators: _____ Cartridge type: _____ Fit tests confirmed: _____

Supplied air units: _____

Coveralls required: _____

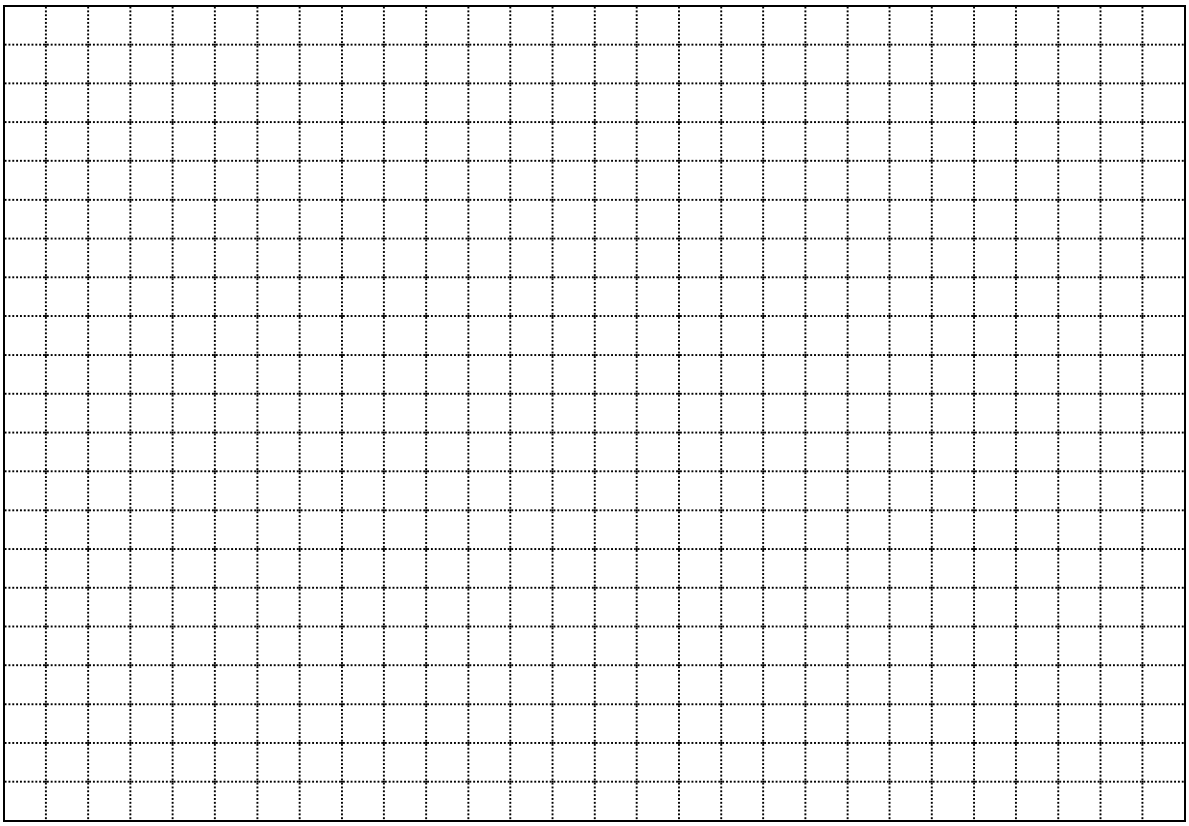
♦ Hygiene and decontamination options (reducing exposures after work has stopped or during breaks)

Water or washing facilities on site: _____

Vacuuming clothing/self: _____

Safe work procedures and other details: _____

Ventilation plan (sketch)



⇦ Show direction of airflow including makeup air locations and discharge air outlets

Area or location in building of ventilation plan (e.g., floor #, wing)

Date plan was reviewed by workers and posted for workers to see

Types of neg. air fans & no.'s *

* Indicate on plan by number the location of the negative air fans

Ventilation safety checklist

- ☐ Makeup air free of possible contaminants
- ☐ Exhaust fan operation has failure warning
- ☐ Dilution fans not stirring up dust
- ☐ Wetting of materials used to keep dust down
- ☐ Workers not placed between contaminants created and exhaust inlet ports
- ☐ Discharge air not affecting others
- ☐ All workers equipped with approved respirators

Note: Attach additional sheets if needed or other documents if required due to hazards or work conditions.

Print supervisor's name

Supervisor's signature

6951 Westminster Highway, Richmond, BC
Mailing Address: PO Box 5350, Vancouver BC, V6B 5L5
Telephone 604 276-3100 Toll Free 1-888-621-7233 Fax 604 276-3247

INSPECTION REPORT
Worker and Employer Services Division

The *Workers Compensation Act* requires that the employer must post a copy of this report in a conspicuous place at or near the workplace inspected for at least seven days, or until compliance has been achieved, whichever is the longer period. A copy of this report must also be given to the joint committee or worker health and safety representative, as applicable.

Inspection Report #201717748058A

Employer Name	Jobsite Inspected	Scope of Inspection
CITY OF VANCOUVER	ATTN: ORGANIZATIONAL HEALTH HUMAN RESOURCES SERVICES VANCOUVER BC V5Y 1V4	Meeting to Discuss Proposed Employer Asbestos Guideline

Date of Initiating Inspection	Date of This Inspection	Delivery Date of This Report	Delivery Method
Jul 20, 2017	Jul 20, 2017	Jul 22, 2017	Email

THERE ARE ZERO (0) ORDERS OR OTHER ITEMS OUTSTANDING

ACTION MAY STILL BE NECESSARY TO ENSURE COMPLIANCE
PLEASE READ FULL REPORT

6951 Westminster Highway, Richmond, BC
Mailing Address: PO Box 5350, Vancouver BC, V6B 5L5
Telephone 604 276-3100 Toll Free 1-888-621-7233 Fax 604 276-3247

INSPECTION NOTES

On Thursday July 20, 2017, Prevention Officer Jonathan Truefitt attended a meeting with this employer pertaining to matters of compliance with the Occupational Health and Safety Regulation (OHSR) and the Workers Compensation Act (WCA). The scope of the meeting was to discuss the employer's proposed internal guideline regarding the threshold date for sampling of asbestos. Indoor air quality was also discussed at the meeting.

Items discussed with the employer and worker representatives included, but were not limited to, the following:

A) PROPOSED EMPLOYER INTERNAL GUIDELINE FOR THRESHOLD DATE FOR SAMPLING OF ASBESTOS

This employer is considering the development of an internal guideline relating to the threshold date for the sampling of asbestos in this employer's buildings and workplaces based on construction dates. The employer provided this Officer with a copy of the document titled "Determination of a Testing Threshold Date for Asbestos in City-Owned Buildings" dated May 24, 2017. The document outlines the employer's plan to use historical sampling from the asbestos inventory of this employer's buildings and workplaces as a basis for the guideline. The employer is intending to use this guideline to implement a testing threshold date of 1990 for sampling of asbestos in both residential and commercial buildings after which date the number of asbestos samples required to be collected would be minimized.

The Occupational Health and Safety Regulation (OHSR) does not prescribe a threshold or cut-off date after which suspect materials are not required to be sampled for asbestos.

In regards to an asbestos inventory, Section 6.4(1) of the OHSR requires that a qualified person collects representative samples of the materials in the workplace that the qualified person suspects contain asbestos. Section 20.112(2) of the OHSR requires that a qualified person inspects the machinery, equipment, building or structure and the worksite to identify the hazardous materials (including asbestos), prior to demolition or salvage of machinery, equipment, a building or a structure, or the renovation of a building or structure.

The employer's attention is brought to the underlined sections above, in that the determination of which materials are required to be sampled for asbestos in regards to the above regulations is the determination of the qualified person. Therefore, the above regulations do not prohibit the employer from implementing an internal guideline regarding threshold dates for testing of asbestos *provided* that such a guideline is developed by a qualified person and is supported by evidence.

The employer has stated in their document referenced above that historical sampling from this employer's asbestos inventory will be used as part of the development of the threshold date guideline. It is expected that a detailed report would be developed by a qualified person and made available to workers and other's as necessary, as supporting evidence for the implementation of the threshold date guideline. A report would be expected to have sections that include, but not be limited to, the following: roles and responsibilities in the development of the threshold date guideline; a detailed methodology; details on the historical sampling results including a breakdown of material types; extrapolation on the conclusions inferred from the sample results and from any other supporting information or references; and any limitations on the use the use of the threshold date guideline.

Regardless of the development of the threshold date guideline, the employer is reminded that Section 20.112(2) and 20.112(3) of the OHSR would still require a qualified to perform a case-by-case inspection for hazardous materials prior to any demolition or salvage of machinery, equipment, a building or a structure, or the renovation of a building or structure, and the development of a report of the inspection.

However, a qualified person may determine that such inspections and subsequent reports may utilize the threshold date guideline along with supporting documents such as as-built drawings, historical renovation drawings, or original building specifications and contracts, to limit the amount of asbestos samples required to be taken. The qualified person would make the determination on the amount of asbestos samples (if any) to be taken, and would develop a subsequent report based on the scope of work and the known information. For example, the qualified person may determine as part of an inspection, and by using the threshold date guideline, that a post-1990 building does not require any asbestos samples to be collected (or only minimal samples) and that a simple letter suffices as a report for compliance of Section 20.112. This would be at the discretion of the qualified person and the

qualified person may be required to provide evidence of their decisions and determinations should it be requested.

The employer is reminded that Section 20.112 of the regulation applies to other hazardous materials in addition to asbestos. Therefore, although a qualified person may determine that a post-1990 building does not require samples to be collected for asbestos, they must still inspect for the presence of other hazardous materials.

It is also expected that the development of the guideline be completed in consultation with the joint health and safety committee(s) of this employer.

NEXT STEPS

Should the employer decide to move forward with the development of the threshold date guideline, inform this Officer of that decision. A copy of a detailed report as discussed above that supports the employer's threshold date guideline may then be requested to be provided at a future date.

B) INDOOR AIR QUALITY

The requirements of Section 4.79 of the OHSR were discussed that state that:

(1) The employer must ensure that the indoor air quality is investigated when

(a) complaints are reported,

(b) occupancy in the space changes substantially, or

(c) renovations involving significant changes to the ventilation system occur.

(2) An air quality investigation must include

(a) assessment of the ventilation rate, unless the indoor carbon dioxide level is less than 650 ppm above ambient outdoor levels,

(b) inspection of the ventilation system as required in Section 4.78(2) of the OHSR,

(c) sampling for airborne contaminants suspected to be present in concentrations associated with the reported complaints, and

(d) a record of the complaint, the findings of the investigation, and any actions taken.

In regards to section (c) above, a qualified person may make the determination on when sampling is required based on the complaint. For example, if the complaint is limited to air temperature, the qualified person may determine that sampling for an airborne contaminant may not be required.

In addition to Section 4.79 the employer is reminded of Section 5.59 of the OHSR which states that:

(1) If a worker exhibits signs or reports symptoms of overexposure to a hazardous substance present in the workplace, the employer must investigate and assess the potential for exposure.

(2) If the assessment demonstrates that the signs or symptoms can be caused by exposure to a hazardous substance that is present in the workplace, further investigation must be conducted, in consultation with the joint committee or the worker health and safety representative, as applicable, to address and resolve the worker's concern.

(3) Records of the investigation required under subsection (2) must be made available to workers, and maintained by the employer for a minimum of 10 years.

A qualified person may make the determination on which section of the OHSR applies to a certain situation given the nature of the complaint or concern, or on the nature of any reporting of symptoms.

C) CONTACT

If there are any questions regarding the items noted in this inspection report, please contact:

Jonathan Truefitt, B.Sc. - Occupational Hygiene Officer - WorkSafeBC
E-mail: jonathan.truefitt@worksafebc.com
Mail: P.O. Box 5350 Stn. Terminal, Vancouver, B.C. V6B 5L5
Phone: 604-244-6486 || Fax: 604-232-1558

For more information on occupational health and safety, visit: www.worksafebc.com

WORK SAFE BC

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Telephone 604 276-3100 Toll Free 1-888-621-7233 Fax 604 276-3247

REFERENCES

In addition to any orders, or other items, and the information provided in the Inspection Notes section in this Inspection Report, the officer may discuss other health and safety issues with the employer arising out of the inspection. The information below sets out the health and safety requirements discussed with the employer, and unless otherwise noted, violations of these requirements were not observed.

Reference	Details Discussed
OHS20.112(2) Before work begins on the demolition or salvage of machinery, equipment, a building or a structure, or the renovation of a building or structure, all employers responsible for that work, and the owner, must ensure that a qualified person inspects the machinery, equipment, building or structure and the worksite to identify the hazardous materials, if any.	As discussed in the inspection notes.
OHS20.112(1) In this section: "hazardous material" means a hazardous substance, or material containing a hazardous substance, including (a) asbestos-containing material, (b) lead or any other heavy metal, or (c) toxic, flammable or explosive material, that may be handled, disturbed or removed in the course of the demolition or salvage of machinery, equipment, a building or a structure, or the renovation of a building or structure; “qualified person”, except in subsections (7) and (8), means a person who (a) has, through education and training, knowledge of the management and control of the hazardous materials that the qualified person is made aware of by the employers, and the owner, or that are reasonably foreseeable by the qualified person, as being (i) on or in the machinery, equipment, building or structure that is the subject of the demolition, salvage or renovation, or (ii) at the worksite, and (b) has experience in the management and control of those hazardous materials.	As discussed in the inspection notes.

Reference	Details Discussed
OHS20.112(3) In conducting an inspection and identifying the hazardous materials, if any, under subsection (2), a qualified person must do the following: (a) collect representative samples of the material that may be hazardous material; (b) identify each representative sample and determine whether it is hazardous material; (c) if the actions under paragraphs (a) and (b) are not practicable, or not appropriate in the circumstances, use other sufficient means to identify the hazardous materials, if any; (d) based on the actions taken under paragraphs (a) and (b) or (c), determine the location of each of the hazardous materials identified; (e) make a written report of the inspection, including, (i) if the actions under paragraphs (a) and (b) were taken, (A) the location of each representative sample, and (B) the identity of each representative sample and whether it is hazardous material, (ii) if the actions under paragraph (c) were taken, the identity of each of the hazardous materials, if any, (iii) a description of the methods used under paragraph (b) or (c), (iv) the location, as determined under paragraph (d), of each of the hazardous materials identified, including by using drawings, plans or specifications, and (v) the approximate quantity of each of the hazardous materials identified.	As discussed in the inspection notes.

Reference	Details Discussed
OHS6.4(1) The employer and the owner must ensure that a qualified person (a) collects representative samples of the materials in the workplace that the qualified person suspects contain asbestos, (b) determines whether each of the samples is asbestos-containing material in accordance with (i) in the case of a sample that is not vermiculite insulation, one of the methods set out in paragraph (a)(i) to (iii) of the definition of “asbestos-containing material” in section 6.1, and (ii) in the case of a sample that is vermiculite insulation, the method set out in paragraph (b) of the definition of “asbestos-containing material” in section 6.1, and (c) prepares an inventory of all asbestos-containing materials in the workplace that includes the following information: (i) with respect to each representative sample collected under paragraph (a), (A) the specific location of the sample, (B) a description of the sample, (C) whether the sample is asbestos-containing material as determined under paragraph (b), (D) the method, set out in paragraph (a)(i) to (iii) or (b) of the definition of “asbestos-containing material” in section 6.1, used to determine if the sample is asbestos-containing material, and (E) if the sample is determined to be asbestos-containing material, the type of asbestos, as determined under paragraph (b), and the percentage of the sample that is comprised of that asbestos; (ii) with respect to each material that, under subsection (2), is treated under this Part as asbestos-containing material because it is inaccessible or not practicable to sample, (A) the specific location of the material or, if the specific location is not known, the presumed location of the material, (B) a description of the material, and (C) how it is determined that the material is inaccessible or not practicable to sample; (iii) the location of each of the asbestos-containing materials, including by using drawings, plans or specifications.	As discussed in the inspection notes.
OHS4.79(1)(a) The employer must ensure that the indoor air quality is investigated when complaints are reported.	As discussed in the inspection notes.
OHS4.79(1)(b) The employer must ensure that the indoor air quality is investigated when occupancy in the space changes substantially.	As discussed in the inspection notes.

Reference	Details Discussed
OHS4.79(1)(c) The employer must ensure that the indoor air quality is investigated when renovations involving significant changes to the ventilation system occur.	As discussed in the inspection notes.
OHS4.79(2)(a) An air quality investigation must include assessment of the ventilation rate, unless the indoor carbon dioxide level is less than 650 ppm above ambient outdoor levels. Note: in Subsection (2)(a) carbon dioxide is considered a marker indicator of sufficient outdoor air, not as a toxic air contaminant for which the exposure limit in Table 5-4 would apply. Normally, ambient levels are approximately 350 ppm, but may be higher in locations such as urban areas or during weather conditions such as inversions. Ambient levels may be assumed to be 350 ppm unless sampling establishes otherwise.	As discussed in the inspection notes.
OHS4.79(2)(b) An air quality investigation must include inspection of the ventilation system as required in section 4.78(2).	As discussed in the inspection notes.
OHS4.79(2)(c) An air quality investigation must include sampling for airborne contaminants suspected to be present in concentrations associated with the reported complaints.	As discussed in the inspection notes.
OHS4.79(2)(d) An air quality investigation must include a record of the complaint, the findings of the investigation, and any actions taken.	As discussed in the inspection notes.
OHS5.59(1) If a worker exhibits signs or reports symptoms of overexposure to a hazardous substance present in the workplace, the employer must investigate and assess the potential for exposure.	As discussed in the inspection notes.
OHS5.59(2) If the assessment demonstrates that the signs or symptoms can be caused by exposure to a hazardous substance that is present in the workplace, further investigation must be conducted, in consultation with the joint committee, or worker health and safety representative, as applicable to address and resolve the worker's concern.	As discussed in the inspection notes.

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Reference	Details Discussed
OHS5.59(3) Records of the investigation required under Subsection 5.59(2) must be made available to workers, and maintained by the employer for a minimum of 10 years.	As discussed in the inspection notes.

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INSPECTION REPORT
Worker and Employer Services Division
201717748058A

Employer #	Mailing Address	Classification Unit #	Operating Location
1770	ATTN: ORGANIZATIONAL HEALTH HUMAN RESOURCES SERVICES 453 12TH AVE W VANCOUVER BC V5Y 1V4	753004	006

Lab Samples Taken	Direct Readings	Results Presented	Sampling Inspection(s)
N	N	N	

Workers onsite during Inspection	Notice of Project Number
4	

Inspection Report Delivered To	Employer Representative Present During Inspection	Worker Representative Present During Inspection	Labour Organization & Local
Andrew Ross	Chris Adolf	Brian Kerin	CUPE 15

WorkSafeBC Officer Conducting Inspection
Jonathan Truefitt

*Inspection Time	*Travel Time
4.00 hrs	0.50 hrs

*The time recorded above reflects the inspection time and travel time associated with this inspection report and includes time spent on pre and post-inspection activities. Additional time may be added for subsequent activity.

Right to Review

Any employer, worker, owner, supplier, union, or a member of a deceased worker's family directly affected may, within 45 calendar days of the delivery date of this report, in writing, request the Review Division of WorkSafeBC to conduct a review of an order, or the non-issuance of an order, by contacting the Review Division. Employers requiring assistance may contact the Employers' Advisers at 1-800-925-2233.

WorkSafeBC values your feedback. To obtain that feedback, an external market research provider may be contacting you to complete a survey.

CITY OF VANCOUVER

REAL ESTATE & FACILITIES MANAGEMENT
Facilities Planning & Development

Pre-Renovation Hazardous Building Materials Assessment of 555/575 West 8th Avenue

According to the City's records, the building located at 555/575 West 8th Avenue, Vancouver, BC is a building constructed in the year 1992. Based on Municipal, Provincial and Federal laws that prohibit the use of asbestos and lead in the building construction industry, the undersigned AHERA Building Inspector has determined that no suspected asbestos containing materials or lead-containing paints are present in the interior finishes found within this building (mechanical, electrical, and structural components are not included). Therefore, during this hazardous materials assessment no materials were suspected to contain asbestos and no paints are suspected to be lead-containing. Samples of building materials were not collected for the analysis of asbestos – *WorkSafeBC Inspection Report#20177748058A* or lead. This decision however, does not apply to any other hazardous materials that may be found at this site.

Based on the scope of work for the upcoming renovations, other hazardous building materials (polychlorinated biphenyl's, ozone depleting substances, mercury, equipment with radioactive components etc.) are not expected to be encountered.

Should existing mechanical equipment, electrical equipment, or painted structural beams planned to be disturbed, further assessment may be required.

Report Prepared by City of Vancouver Hazardous Materials Team

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Per: Jun Han Poon, Hazardous Materials Technician
AHERA Certification No. CABIR-16-073