

UHN - DI CT 64 Replacement

University Hospital of Northern British Columbia, 1475, Edmonton St.,
Prince George, BC, V2L 3X2

Replacement of the existing CT Scan, refresh of ceiling and wall finishes.
Replacement of the existing sink with a CSA Z8000 compliant handwash
sink; Upgrades to the electrical & mechanical within the space. Structural
work for the new scan.

ISSUED FOR TENDER

Architectural Specifications

August 5, 2026

Prepared for:

NHA

Prepared by:

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Section 00 01 03

Project Directory

Part 1 General

1.1 Client

1. Northern Health
300 -299 Victoria Street
Prince George, BC V2L 5B8

Project Manager: Lloyd Nordin, EIT

p: 250-645-8797
e: lloyd.nordin@northernhealth.ca

1.2 Architect

1. J. Robert Thibodeau Architecture + Design Inc.
138 West 8th Avenue
Vancouver, British Columbia
V5Y 1N2

Project Director: Harsh Mehra, Architect AIBC
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Project Manager: Marjorie Beaulieu, APDIQ, DIC, NCIDQ, RID, WELL AP
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e: marjorie.beaulieu@gotad.ca

1.3 Electrical

1. O'M Engineering
#630- 8188 Manitoba St,
Vancouver, BC- V5X 0L5

Electrical Engineer: Henry (Hong) Yin, P.Eng

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e: henry@omengineering.ca

1.4 Mechanical

1. Aperta Consulting Inc.
#205- 3003 St Johns St,
Port Moody, BC- V3H 0LH

Mechanical Engineer: James Y.P Lee, P.Eng

p: 778.231.5278
e: james.lee@aperta.consulting

1.5 Structural

1. RJC Engineers
#300 1285W Broadway,
Vancouver, BC- V6H 3X8

Cost Consultant: Colin Macmillan, P.Eng

p: 604.739.6259

e: cmacmillan@rjc.ca

End of Section

Section 00 01 15 List of Drawing Sheets

Part 1 General

1.1 List of Drawings

1. Architectural

1.1.

DRAWING NO.	DESCRIPTION
A000	Cover Sheet
A001	Door & Hardware Schedules
A100	Demolition & Construction Plan + RCP
A101	Finishes demo & construction plan
A102	Millwork details

2. Structural

2.1.

DRAWING NO.	DESCRIPTION
S100	General notes
S200	Level 2 Floor part plan
A301	Sections and details

3. Electrical

3.1.

DRAWING NO.	DESCRIPTION
E000	Cover Page
E010	Partial single line diagram
E020	Exist. and new power & low tension plan
E025	Existing and new lighting plan
E030	Electrical details
E031	Electrical details

4. Mechanical

4.1.

DRAWING NO.	DESCRIPTION
M01	Cover Page
M02	HVAC Plans
M03	Plumbing plans
M04	Fire supression plan

Part 2 Products - Not Used

Part 3 Execution - Not Used

End of Section

Section 00 31 00

Available Project Information

Part 1 General

1.1 Definitions

1. Available Project Information: information identified in this Section, of any type, and in any form, and identified as Available Project Information. Available Project Information, or any part thereof, does not form part of the Contract Documents unless specifically incorporated into Contract Documents by means of copying, transcribing, or referencing, or is listed in the Agreement as a Contract Document.
2. Contractor: synonymous with Bidder

1.2 Use and reliance upon available project information

1. Available Project Information is made available to Bidders for the purpose of disclosing information that is available to the Consultant and Owner.
2. Per CCDC, Available Project information is made available to Bidders to fulfill the Consultant's duty to disclose all relevant Project information to Bidders.
3. Do not consider the Available Project Information as a representation or warranty that the information is necessarily accurate, complete, or appropriate.
4. Bidders are responsible for interpreting and forming their own conclusions about the Available Project Information, including consideration of the time the document was created. Bidders are encouraged to obtain specialist advice if necessary. Consultant and Owner assume no responsibility for interpretations or conclusions made.
5. In the event there is a conflict between the Contract Documents and the recommendations contained in the Available Project Information, the Contract Documents shall govern.

1.3 Available project information

1. The following Available Project Information is not incorporated into the Contract Documents, but is made available to Bidders:
 - 1.1. Existing Hazardous Material Information
2. The following Available Project Information is incorporated into the Contract Documents , in whole or in part:
 - 2.1. Existing Building Drawings

1.4 Existing hazardous material information

1. Refer to hazardous materials report for information and guidelines including: executive summary, summary of findings, scope of assessment, findings, recommendations, and referenced Federal and Provincial regulations for hazardous materials.
2. Hazardous Materials Report:
 - 2.1. Report title: Asbestos Bulk Sample Report Certificate of Analysis
 - 2.2. Report publication date: 17-Mar-2026
 - 2.3. Report prepared by: T&T OHS
 - 2.3.1. Address: Unit #2 – 1962 Quinn Street South, Prince George, BC V2N 1X5
3. Hazardous Materials Report:

- 3.1. Report title: Pre-Renovation Hazardous Building Materials Survey
- 3.2. Report publication date: March 23rd, 2026
- 3.3. Report prepared by: T&T OHS
 - 3.3.1. Address: Unit #2 – 1962 Quinn Street South, Prince George, BC V2N 1X5
- 4. A copy of the report is available as a digital file upon request from Owner.

1.5 Related instructions

- 1. Report any irregularities or changed surface conditions at the actual project site to Consultant a minimum of 7 days before Bid close.

Part 2 Products

2.1 Not used

- 1. Not Used.

Part 3 Execution

3.1 Not used

- 1. Not Used.

End of Section

Section 01 11 00

Summary of Work

Part 1 General

1.1 Related requirements

1. Division 01 amends and completes the General Conditions, Supplementary Conditions and other requirements and should be read in conjunction with them. In any contractual document, when reference is made to the General Conditions, it should be read to be the General Conditions, the Supplementary Conditions and Division 01.
2. The Owner will not accept any delay and/or claims for extra expense on the part of the Contractor, or his Subcontractors and suppliers, by reason of their non-compliance with the above clause.
3. Division 01 prescriptions, the General Conditions and the Supplementary Conditions apply to all Divisions and Contract Sections and to all parts of the Work.
4. Whenever the same subject is treated in more than one of the documents mentioned above, the more stringent condition prevails.
5. The arrangement and division of these specifications is not to be construed as establishing the limits of responsibility of sub-trades. The Contractor shall be responsible for delineating the scope of subcontractors and for coordinating all of their work.
6. The Contractor is to ensure that all his sub-trades and suppliers have read and comprehend these provisions and will abide by them.
7. See applicable contractual documents Sections for Mechanical, Structural and Electrical Works with respect to their general requirements, execution, and impact on Architectural works.

1.2 Work covered by contract documents

1. Work of this Contract includes replacing includes the installation of the new CT scan machine at CT Scan room 1, new door replacement, new patient lift and finishes upgrades. It also includes related mechanical, electrical and structural work, and is located at 1475 Edmonton street, Prince George, BC, V2M 1S2
2. The Contractor shall provide all labour, materials, equipment, tools, plant and services equipment, supervision and required services necessary to supply and execute all Architectural works in conformity with drawings, specifications and other documents mentioned herein, including implied required works for completion of works.
3. The Contractor must coordinate all security clearances, bookings, permits, access restrictions, including commissionaires.
4. The Contractor shall execute all preparatory work required and implied in the drawings.
5. The Contractor shall provide all documentation and logs requested in Contract Sections.

1.3 Contract method

1. Construct Work under stipulated price contract.
2. Observe and enforce all construction safety measures required by the British Columbia Building Code 2024, WorkSafe BC/Workers' Compensation Board of British Columbia and Municipal statutes and by-laws.
3. Relations and responsibilities between Contractor and subcontractors and suppliers assigned by Owner are as defined in Conditions of Contract. Assigned Subcontractors shall, in addition:

- 3.1. Purchase and maintain liability insurance to protect Contractor from claims for not less than limits of liability which Contractor is required to provide to Consultant.
4. Provide and implement a Completed Occupational Health & Safety Records and Plan as a condition of award, within 5 days of being requested.
5. In the event of conflict between any provisions of above safety authorities, the most stringent provision will apply.
6. Claims for additional costs will not be entertained with respect to existing site conditions that could have been ascertained by an inspection of the site, prior to Bid Closing Date, in case an inspection is feasible.

1.4 Submittals

1. Submit in accordance with Section 01 33 00 - Submittal Procedures
2. Submit Project construction progress schedule in accordance with Section 01 32 16.19 - Construction Progress Schedule - Bar (GANTT) Chart.
3. Sustainable Design Submittals:
 - 3.1. Construction Waste Management:
 - 3.1.1. Submit calculations on end-of-project recycling rates, salvage rates, and landfill rates demonstrating 75 % of construction wastes recycled or salvaged
4. Submit site-specific and Work Plan Health and Safety Plan in accordance with Section 01 35 29.06 - Health and Safety Requirements.

1.5 Work by others

1. Co-operate with other Contractors in carrying out their respective works and carry out instructions from Consultant.
2. Co-ordinate work with other contractors. If any part of work under this Contract depends for its proper execution or result upon work of another contractor, report promptly to Consultant, in writing, any defects which may interfere with proper execution of Work.
3. SPEC NOTE: Use the following paragraph only to designate work to be executed after completion of this Contract, but which is part of Project. Co-ordinate with Drawings.
4. Work of this Project must include provisions for co-ordinating related work, identified in Contract Documents, for following principal items.

1.6 Work sequence

1. Construct Work in stages to accommodate Owner's continued use of premises during construction.
2. Co-ordinate Progress Schedule and co-ordinate with Owner Occupancy during construction.
3. Construct Work in stages to provide for continuous public usage. Do not close off public usage of facilities until use of one stage of Work will provide alternate usage.
4. Maintain fire access/control.
5. Protect workers and public safety.
6. The Contractor shall remove existing constructions, finishes, furnishings and equipment as needed per architectural drawings
7. Ascertain all existing conditions reasonably inferable from examination of the site and its surroundings and the Contract Documents with respect to surface and sub-surface conditions, access to the site, restrictions prevailing on adjacent streets, disposal of materials, municipal by-laws with respect to noise, street cleaning, pollution and other conditions having effect on the execution of the Work. Include in the Contract Price all costs associated with the above.

8. Report promptly to the Consultant any discrepancy, inaccuracy or deviation between the information contained in the Contract Documents and the actual conditions found to be in existence during the process of the work.

1.7 Contractor use of premises

1. Unrestricted use of site until Substantial Performance.
2. Limit use of premises for Work, for access, to allow:
 - 2.1. Partial owner occupancy.
3. Co-ordinate use of premises under direction of Consultant.
4. Obtain and pay for use of additional storage or work areas needed for operations under this Contract.
5. Refer to Section 01 51 00 - Temporary Utilities, Section 01 52 00 - Construction Facilities and Section 01 56 00 - Temporary Barriers and Enclosures, for temporary facilities, access roads and parking areas, traffic regulations, and utilities.
6. Remove or alter existing work to prevent injury or damage to portions of existing work which remain.
7. Repair or replace portions of existing work which have been altered during construction operations to match existing or adjoining work, as directed by Consultant.
8. Ensure that operations conditions of exiting work at completion are still the same, equal to or better than that which existed before new work started.

1.8 Owner occupancy

1. Owner will occupy premises during entire construction period for execution of normal operations.
2. The Contractor must organize the work in such a manner so as not to disturb the daily activities and operations of the building occupants.

All construction work must occur outside of regular office hours (Monday to Friday from 6:00pm to 6:00am), and on Saturdays, Sundays and statutory holidays.
3. Co-operate with Owner in scheduling operations to minimize conflict and to facilitate Owner usage.
4. Take all required measures to ensure the execution of work is completed within the time frame set by the Owner.
5. Take all protective measures necessary to ensure the security of the users and the existing facilities. Ensure the respect of applicable security by-laws and maintain a safe work site.
6. No additional expenses can be charged to the Owner, with respect to the above-mentioned conditions.

1.9 Partial owner occupancy

1. Schedule and substantially complete designated portions of Work for Owner's occupancy prior to Substantial Performance of entire Work.
2. Execute Certificate of Substantial Performance for each designated portion of Work prior to Owner occupancy. Contractor shall allow:
 - 2.1. Access for Owner personnel.
 - 2.2. Use of parking facilities.

1.10 Pre-ordered products or pre-bid work

1. Not used.

1.11 Pre-purchased equipment

1. Not used.

1.12 Owner furnished items

1. Owner Responsibilities:
 - 1.1. Arrange for delivery of shop drawings, product data, samples, manufacturer's instructions, and certificates to Contractor.
 - 1.2. Deliver supplier's bill of materials to Contractor.
 - 1.3. Arrange and pay for delivery to site in accordance with Progress Schedule.
 - 1.4. Arrange for replacement of damaged, defective or missing items.
 - 1.5. Arrange for manufacturer's field services; arrange for and deliver manufacturer's warranties and bonds to Contractor.
2. Contractor Responsibilities:
 - 2.1. Designate submittals and delivery date for each product in progress schedule.
 - 2.2. Review shop drawings, product data, samples, and other submittals. Submit to Consultant notification of observed discrepancies or problems anticipated due to non-conformance with Contract Documents.
 - 2.3. Receive and unload products on Site.
 - 2.4. Inspect deliveries jointly with Owner; record shortages, and damaged or defective items.
 - 2.5. Handle products on Site, including uncrating and storage.
 - 2.6. Protect products from damage, and from exposure to elements.
 - 2.7. Assemble, install, connect, adjust, and finish products.
 - 2.8. Provide installation inspections required by public authorities.
 - 2.9. Repair or replace items damaged by Contractor or subcontractor on site (under his control).

1.13 Alterations, additions or repairs to existing building

1. Execute work with least possible interference or disturbance to occupants, public and normal use of premises. Arrange with Consultant to facilitate execution of work.
2. Use only elevators, dumbwaiters, conveyors existing in building for moving workers and material.
 - 2.1. Investigate the status of existing elevators, dumbwaiters, conveyors in building(s), if they are functional and safe for moving workers and materials before the Work starts.
 - 2.2. Provide the required protection for passenger elevators walls, obtain Consultant approval before using these elevators.
 - 2.3. Accept liability for damage, safety of equipment and overloading of existing equipment.

1.14 Existing services

1. Notify, Consultant and utility companies of intended interruption of services and obtain required permission.
2. Where Work involves breaking into or connecting to existing services, give 48 hours notice for necessary interruption of mechanical or electrical service throughout course of work. Minimize duration of interruptions. Carry out work at times as directed by governing authorities with minimum disturbance to tenant operations.
3. Provide alternative routes for personnel and vehicular traffic.
4. Provide alternative routes for personnel.

5. Establish location and extent of service lines in area of work before starting Work. Notify Consultant of findings.
6. Submit schedule for approval by Consultant for any shut-down or closure of active service or facility including power and communications services. Adhere to approved schedule and provide notice to affected parties.
7. Provide temporary services to maintain critical building and tenant services.
8. Where unknown services are encountered, immediately advise Consultant and confirm findings in writing.
9. Protect, relocate or maintain existing active services. When inactive services are encountered, cap off in manner approved by authorities having jurisdiction.
10. Record locations of maintained, re-routed and abandoned service lines.
11. Construct barriers, as required, in accordance with Section 01 56 00 - Temporary Barriers and Enclosures.

1.15 Documents required

1. Maintain at job site, one copy of each document as follows:
 - 1.1. Contract Drawings.
 - 1.2. Specifications.
 - 1.3. Addenda.
 - 1.4. Reviewed Shop Drawings.
 - 1.5. List of Outstanding Shop Drawings.
 - 1.6. Change Orders.
 - 1.7. Other Modifications to Contract.
 - 1.8. Field Test Reports.
 - 1.9. Copy of Approved Work Schedule.
 - 1.10. Health and Safety Plan and Other Safety Related Documents.
 - 1.11. Other documents as specified.

Part 2 Products

2.1 Not used

1. Not used.

Part 3 Execution

3.1 Not used

1. Not used.

End of Section

Section 01 14 00

Work Restrictions

Part 1 General

1.1 Precedence

1. For Government projects, Division 1 sections take precedence over technical specification sections in other Divisions of this Project Manual.

1.2 Access and Egress

1. Design, construct and maintain temporary "access to" and "egress from" work areas, including stairs, runways, ramps or ladders and scaffolding, independent of finished surfaces and in accordance with relevant municipal, provincial and other regulations.

1.3 Use of site and facilities

1. Execute work with least possible interference or disturbance to normal use of premises. Make arrangements with Owner to facilitate work as stated.
 - 1.1. Contractor to inform and coordinate with Owner the schedule of works that will take place outside of normal business hours at least two (2) days in advance.
 - 1.2. Five (5) days advance written authorization is required for all planned requirements for building access, key authorization, fire alarm by-passes, life safety, electrical, heating, ventilation and air conditioning systems.
 - 1.3. One (1) week advance notice is required for any work that will require the disruption of services to tenants during regular business hours.
 - 1.4. Contractor must coordinate all the security clearances, bookings, permits, and access restrictions, including commissionaires.
2. The Contractor is to coordinate with client for all access, delivery and disposal of materials, storage, parking and any other use of site issues. Repair any damage done to the site and building at the end of the work.
3. Determine work zones and supplementary staging or storage areas required for the execution of works in accordance with the terms of the contract. The Contractor to cover all associated costs
 - 3.1. The Contractor shall not unduly accumulate materials and equipment that clutter the site. Avoid congestion on site. Evacuate all excess materials from the site.
 - 3.2. Keep all access routes clear of obstructions at all times. Use adequate signage as required for temporary obstructions.
4. Maintain existing services to building and provide for personnel and vehicle access.
5. Only those persons whose presence is necessary for the execution of the Work shall have the right to access the site.
6. Where security is reduced by work provide temporary means to maintain security.
7. Food and beverage consumption is strictly limited to the specifically assigned spaces provided by the Contractor for use by Contractor's personnel. No beverage containing alcohol is permitted.
8. No rubbish, bottles or paper bags shall be left in the work area or the facility.
9. Smoking is strictly forbidden on the project site.
10. Contractor must provide sanitary facilities for use by Contractor's personnel. Keep facilities clean.

1.4 Alterations, additions or repairs to existing building

1. Execute work with least possible interference or disturbance to occupants, and normal use of premises. Arrange with the building manager to facilitate execution of work.
2. Repair or replace, as indicated by the Architect, all elements of the existing building that were modified during Construction in order to connect and harmonize to services.
3. Once works are complete, the existing building site shall be delivered in a state superior to its state prior to Construction.

1.5 Special requirements

1. Construction work that is dust or odor-generating or otherwise disruptive must occur on weekends: starting Fridays from 6:00pm; anytime on Saturdays, Sundays, and statutory holidays; with work ending by 6am on Mondays.
2. Submit schedule in accordance with Section 01 32 16.19 - Construction Progress Schedule - Bar (GANTT) Chart.
3. Ensure Contractor's personnel employed on site become familiar with and obey regulations including safety, fire, traffic and security regulations.
4. Keep within limits of work and avenues of ingress and egress.
5. The Contractor and his staff shall park their vehicles as directed by the Owner.

1.6 Special requirements

1. Paint and carpet public or Departmental Representative occupied areas Monday to Friday from 18:00 to 07:00 hours only and on Saturdays, Sundays, and statutory holidays.
2. Carry out noise generating Work Monday to Friday from 18:00 to 07:00 hours and on Saturdays, Sundays, and statutory holidays.
3. Submit schedule in accordance with Section 01 32 16.19 - Construction Progress Schedule - Bar (GANTT) Chart.
4. Ensure Contractor's personnel employed on site become familiar with and obey regulations including safety, fire, traffic and security regulations.
5. Keep within limits of work and avenues of ingress and egress.

1.7 Security

1. Contractor and Contractor's personnel must be authorized to work on site.
2. Contractor must provide site security and control access to site and lock down the site after work hours.

1.8 Building smoking environment

1. Comply with smoking restrictions. Smoking is not permitted.

Part 2 Products

2.1 Not used

1. Not Used.

Part 3 Execution

3.1 Not used

1. Not Used.

End of Section

Section 01 29 00

Payment Procedures

Part 1 General

1.1 References

1. Owner/Contractor Agreement: Standard Format as endorsed by the Province.
2. Canadian Construction Documents Committee (CCDC)
 - 2.1. CCDC 2-2020, Stipulated Price Contract.

1.2 Applications for progress payment

1. Refer to CCDC 2-2020.
2. Refer to Standard Format as endorsed by the Province.
3. Make applications for payment on account as monthly as Work progresses.
4. Date applications for payment last day of agreed monthly payment period and ensure amount claimed is for value, proportionate to amount of Contract, of Work performed and Products delivered to Place of Work at that date.
5. Submit to Consultant, at least 10 working days before first application for payment. Schedule of values for parts of Work, aggregating total amount of Contract Price, to facilitate evaluation of applications for payment.

1.3 Schedule of values

1. Refer to CCDC 2-2020.
2. Provide schedule of values supported by evidence as Consultant may reasonably direct and when accepted by Consultant, be used as basis for applications for payment.
3. Include statement based on schedule of values with each application for payment.
4. Support claims for products delivered to Place of Work but not yet incorporated into Work by such evidence as Consultant may reasonably require to establish value and delivery of products.

1.4 Preparing

1. Schedule of unit
 - 1.1. Price table items:
 - 1.1.1. Submit separate schedule of unit price items of Work requested in Bid form.
 - 1.1.2. Make form of submittal parallel to Schedule of Values, with each line item identified same as line item in Schedule of Values. Include in unit prices only:
 - 1.1.2.1. Cost of material.
 - 1.1.2.2. Delivery and unloading at site.
 - 1.1.2.3. Sales taxes.
 - 1.1.2.4. Installation, overhead, and profit.
2. Ensure unit prices multiplied by quantities given equal material cost of that item in Schedule of Values.

1.5 Progress payment

1. Payment
 - 1.1. Refer to CCDC 2-2020.
2. Consultant will issue to Owner, no later than 10 days after receipt of an application for payment, certificate for payment in amount applied for or in such other amount as Consultant determines to be due. If Consultant amends application, Consultant will give notification in writing giving reasons for amendment.

1.6 Substantial performance of work

1. Performance of Work.
 - 1.1. Refer to CCDC 2-2020.
2. Prepare and submit to Consultant comprehensive list of items to be completed or corrected and apply for a review by Consultant to establish Substantial Performance of Work or substantial performance of designated portion of Work when Work is substantially performed if permitted by lien legislation applicable to Place of Work designated portion which Owner agrees to accept separately is substantially performed. Failure to include items on list does not alter responsibility to complete Contract.
3. No later than 10 days after receipt of list and application, Consultant will review Work to verify validity of application, and no later than 7 days after completing review, will notify Contractor if Work or designated portion of Work is substantially performed.
4. Consultant: state date of Substantial Performance of Work or designated portion of Work in certificate.
5. Immediately following issuance of certificate of Substantial Performance of Work, in consultation with Consultant, establish reasonable date for finishing Work.

1.7 Payment of holdback upon substantial performance of work

1. After issuance of certificate of Substantial Performance of Work:
 - 1.1. Correct deficiencies and complete work 100%.
 - 1.2. Submit application for payment of holdback amount.
 - 1.3. Submit sworn statement that accounts for labour, subcontracts, products, construction machinery and equipment, and other indebtedness which may have been incurred in Substantial Performance of Work and for which Owner might in be held responsible have been paid in full, except for amounts properly retained as holdback or as identified amount in dispute.
2. After receipt of application for payment and sworn statement, Consultant will ensure completeness will issue certificate for payment of holdback amount.
3. Where holdback amount has not been placed in a separate holdback account, Owner shall, the ten (10) working days prior to expiry of holdback period stipulated in lien legislation applicable to Place of Work, place holdback amount in bank account in joint names of Owner and Contractor.
4. Amount authorized by certificate for payment of holdback amount is due and payable on day following expiration of holdback period stipulated in lien legislation applicable to Place of Work. Where lien legislation does not exist or apply, holdback amount is due and payable in accordance with other legislation, industry practice, or provisions which may be agreed to between parties. Owner may retain out of holdback amount sums required by law to satisfy liens against Work or, if permitted by lien legislation applicable to Place of Work, other third party monetary claims against Contractor which are enforceable against Owner.

1.8 Progressive release of holdback

1. Refer to CCDC 2-2020.
2. Where legislation permits, if Consultant has certified that Work of subcontractor or supplier has been performed prior to Substantial Performance of Work, Owner will pay holdback amount retained for such subcontract Work, or products supplied by such supplier, on day following expiration of holdback period for such Work stipulated in lien legislation applicable to Place of Work.
3. In addition to provisions of preceding paragraph, and certificate wording, ensure that such subcontract Work or products is protected pending issuance of final certificate for payment and be responsible for correction of defects or Work not performed regardless of whether or not such was apparent when such certificates were issued.

1.9 Final payment

1. Refer to CCDC 2, GC 5.7.
2. Submit application for final payment when Work is completed.
3. Consultant will, no later than (10) working days after receipt of application for final payment, review Work to verify validity of application. Consultant will give notification that application is valid or give reasons why it is not valid, no later than five (5) working days after reviewing Work.
4. Consultant will issue final certificate for payment when application for final payment is found valid.

Part 2 Products

2.1 Not used

1. Not Used.

Part 3 Execution

3.1 Not used

1. Not Used.

End of Section

Section 01 31 19

Project Meetings

Part 1 General

1.1 Related requirements

1. Section 01 33 00 Submittal Procedures.
2. Section 01 41 00. Regulatory Requirements
3. Section 01 45 00. Quality Control

1.2 Administrative

1. Contractor to schedule and administer project meetings throughout the progress of the work on a semi-monthly basis.
2. Construction coordination meetings to be held virtually.
3. The Contractor shall be present at all of these meetings with his Sub-contractors when their presence is requested by the Owner, the Architect or the Contractor. All Consultants whose presence is required shall be notified by the Contractor, the Owner, or the Architect, as required.
4. Reports and minutes of meetings shall be drafted by the Architect and distributed to the Owner and the Contractor. The Contractor shall distribute them to his Sub-contractors and suppliers as needed.
5. The Contractor shall hold regular meetings with his Sub-contractors and shall inform and/or invite the Consultants, in writing, as required. The minutes of these meetings shall be drafted by the Contractor and distributed to all present with copies sent to the Owner and the Consultants.
6. Representative of Contractor, Subcontractor and suppliers attending meetings will be qualified and authorized to act on behalf of party each represents.

1.3 Preconstruction meeting

1. At the kick-off meeting the following subjects matters, in addition to other matters, shall be discussed:
 - 1.1. The general procedures concerning the project progress;
 - 1.2. Milestones;
 - 1.3. Communication protocols and methods;
 - 1.4. All other pertinent matters.

1.4 Progress meetings

1. During course of Work and 2 weeks prior to project completion, Contractor is to schedule progress meetings semi-monthly.
2. Contractor, major Subcontractors involved in Work, Consultant and BGIS Representative are to be in attendance.
3. Agenda to include the following:
 - 3.1. Review, approval of minutes of previous meeting.
 - 3.2. Review of Work progress since previous meeting.
 - 3.3. Field observations, problems, conflicts.
 - 3.4. Problems which impede construction schedule.
 - 3.5. Review of off-site fabrication delivery schedules.

- 3.6. Corrective measures and procedures to regain projected schedule.
- 3.7. Revision to construction schedule.
- 3.8. Progress schedule, during succeeding work period.
- 3.9. Review submittal schedules: expedite as required.
- 3.10. Maintenance of quality standards.
- 3.11. Review proposed changes for affect on construction schedule and on completion date.
- 3.12. Other business.

Part 2 Products

2.1 Not used

- 1. Not Used.

Part 3 Execution

3.1 Not used

- 1. Not Used.

End of Section

Section 01 32 16.19

Construction Progress Schedule - Bar (GANTT) Chart

Part 1 General

1.1 Related requirements

1. The Contractor shall complete the work within the time limits indicated in the Instructions to Bidders, taking all required measures and obtaining authorization, if necessary, to ensure compliance with the schedule, including by increasing personnel, working overtime and adding extra shifts on weekends and holidays.
2. Responsibility to meet project deadlines remains solely with the Contractor, despite any consultations he may have with the Owner or the Architect.
3. The Owner will reject any claim for extra payment and/or may request an extension of the contract time in order to place orders and/or sign sub-contracts.

1.2 Definitions

1. Activity: element of Work performed during course of Project. Activity normally has expected duration, and expected cost and expected resource requirements. Activities can be subdivided into tasks.
2. Bar Chart (GANTT Chart): graphic display of schedule-related information. In typical bar chart, activities or other Project elements are listed down left side of chart, dates are shown across top, and activity durations are shown as date-placed horizontal bars. Generally Bar Chart should be derived from commercially available computerized project management system.
3. Baseline: original approved plan (for project, work package, or activity), plus or minus approved scope changes.
4. Construction Work Week: Monday to Friday, inclusive, will provide five day work week and define schedule calendar working days as part of Bar (GANTT) Chart submission.
5. Duration: number of work periods (not including holidays or other nonworking periods) required to complete activity or other project element. Usually expressed as workdays or workweeks.
6. Master Plan: summary-level schedule that identifies major activities and key milestones.
7. Milestone: significant event in project, usually completion of major deliverable.
8. Project Schedule: planned dates for performing activities and the planned dates for meeting milestones. Dynamic, detailed record of tasks or activities that must be accomplished to satisfy Project objectives. Monitoring and control process involves using Project Schedule in executing and controlling activities and is used as basis for decision making throughout project life cycle.

1.3 Action and informational submittals

1. Provide submittals in accordance with Section 01 33 00 - Submittal Procedures.
2. Submit Project Schedule (Bar/GANTT Chart) to Consultant within five (5) working days of Award of Contract.
3. At each request for payment, the Contractor shall submit a work progress report (percentage planned vs actual percentage) for the Architect to review and distribute.

1.4 Project Milestones

1. Project milestones for Project Schedule:

- 1.1. Interior finishing and fitting, and electrical, mechanical and structural work completed within 30 days of Mobilisation date;
- 1.2. Interim Certificate (Substantial Completion) within 30 days of Mobilisation date;

1.5 Master plan

- 1. Structure schedule to allow orderly planning, organizing and execution of Work as Bar Chart (GANTT).
- 2. Consultant will review and return revised schedules within 5 working days.
- 3. Revise impractical schedule and resubmit within 5 working days.
- 4. Accepted revised schedule will become Master Plan and be used as baseline for updates.

1.6 Project schedule

- 1. Develop detailed Project Schedule derived from Master Plan.
- 2. Ensure detailed Project Schedule includes as minimum milestone and activity types as follows:
 - 2.1. Award.
 - 2.2. Shop Drawings, Samples.
 - 2.3. Permits.
 - 2.4. Mobilization.
 - 2.5. Demolition
 - 2.6. Slab adjustments
 - 2.7. Interior Architecture (Walls, Floors and Ceiling).
 - 2.8. Plumbing.
 - 2.9. Lighting.
 - 2.10. Electrical.
 - 2.11. Piping.
 - 2.12. Controls.
 - 2.13. Heating, Ventilating, and Air Conditioning.
 - 2.14. Millwork.
 - 2.15. Fire Systems.
 - 2.16. Testing and Commissioning.
 - 2.17. Supplied equipment long delivery items.
- 3. Ensure detailed Project Schedule includes as minimum milestone and activity types as follows:
 - 3.1. Shop Drawings, samples and technical data submittal dates;
 - 3.2. Delivery dates of important equipment and materials;
 - 3.3. Start and end dates of works described in each section of the specifications;
 - 3.4. Date of substantial completion of works in relation to the stipulated end of works as called for in the contractual documents;
 - 3.5. The critical path of works;
 - 3.6. Testing and Commissioning.

1.7 Project schedule reporting

1. Update Project Schedule on weekly basis reflecting activity changes and completions, as well as activities in progress.
2. The Contractor shall explain, in writing, the reason for any slippage and its impact on the overall progress of works. The Contractor shall explain the compensatory measures to be undertaken to recuperate the lost time. Changes and increased costs, for which the Contractor is responsible for, are to be covered by the Contractor.
3. The Contractor shall complete the work within the time limits indicated in the Instructions to Bidders, taking all required measures and obtaining authorization, if necessary, to ensure compliance with the schedule, including by increasing personnel, working overtime and adding extra shifts on weekends and holidays.

1.8 Project meetings

1. Discuss Project Schedule at regular site meetings, identify activities that are behind schedule and provide measures to regain slippage. Activities considered behind schedule are those with projected start or completion dates later than current approved dates shown on baseline schedule.
2. Weather related delays with their remedial measures will be discussed and negotiated.

Part 2 Products

2.1 Not used

1. Not used.

Part 3 Execution

3.1 Not used

1. Not used.

End of Section

Section 01 33 00

Submittal Procedures

Part 1 General

1.1 Related requirements

1. Section 01 35 29.06 - Health and Safety Requirements
2. Section 01 78 00 Closeout Submittals

1.2 Administrative requirements

1. Submit to Consultants submittals listed for review. Submit promptly and in orderly sequence to not cause delay in Work. Failure to submit in ample time is not considered sufficient reason for extension of Contract Time and no claim for extension by reason of such default will be allowed.
2. Do not proceed with Work affected by submittal until review is complete.
3. Present shop drawings, product data, samples and mock-ups in SI Metric units.
4. Where items or information is not produced in SI Metric units converted values are acceptable.
5. Review submittals before submission to Consultant. This review represents that necessary requirements have been determined and verified, or will be, and that each submittal has been checked and coordinated with requirements of Work and Contract Documents. Submittals not stamped, signed, dated and identified as to specific project will be returned without being examined and considered rejected.
6. Notify Consultant, in writing at time of submission, identifying deviations from requirements of Contract Documents stating reasons for deviations.
7. Verify site measurements and affected adjacent Work are coordinated.
8. Contractor's responsibility for errors and omissions in submission is not relieved by Consultant's review of submittals.
9. Contractor's responsibility for deviations in submission from requirements of Contract Documents is not relieved by Consultant review.
10. Keep one reviewed copy of each submission on site.

1.3 Shop drawings and product data

1. Refer to CCDC 2 GC 3.11.
2. The term "shop drawings" means drawings, diagrams, illustrations, schedules, performance charts, brochures and other data which are to be provided by Contractor to illustrate details of a portion of Work.
3. Submit drawings stamped and signed by professional engineer registered or licensed in Province of British Columbia, Canada, as required.
4. Indicate materials, methods of construction and attachment or anchorage, erection diagrams, connections, explanatory notes and other information necessary for completion of Work. Where articles or equipment attach or connect to other articles or equipment, indicate that such items have been coordinated, regardless of Section under which adjacent items will be supplied and installed. Indicate cross references to Contract drawings and specifications.
5. Adjustments made on shop drawings by Consultant are not intended to change Contract Price. If adjustments affect value of Work, state such in writing to Consultant before to proceeding with Work.

6. Make changes in shop drawings as Consultant may require, consistent with Contract Documents. When resubmitting, notify Consultant in writing of revisions other than those requested.
7. Accompany submissions with transmittal letter, in duplicate, containing:
 - 7.1. Date.
 - 7.2. Project title and number.
 - 7.3. Contractor's name and address.
 - 7.4. Identification and quantity of each shop drawing, product data, and sample.
 - 7.5. Other pertinent data.
8. Submissions to include:
 - 8.1. Date and revision dates.
 - 8.2. Project title and number.
 - 8.3. Name and address of:
 - 8.3.1. Subcontractor.
 - 8.3.2. Supplier.
 - 8.3.3. Manufacturer.
 - 8.4. Contractor's stamp, signed by Contractor's authorized representative certifying approval of submissions, verification of site measurements and compliance with Contract Documents.
 - 8.5. Details of appropriate portions of Work as applicable:
 - 8.5.1. Fabrication.
 - 8.5.2. Layout, showing dimensions, including identified site dimensions and clearances.
 - 8.5.3. Setting or erection details.
 - 8.5.4. Capacities.
 - 8.5.5. Performance characteristics.
 - 8.5.6. Standards.
 - 8.5.7. Operating weight.
 - 8.5.8. Wiring diagrams.
 - 8.5.9. Single line and schematic diagrams.
 - 8.5.10. Relationship to adjacent work.
9. Submit one (1) electronic copy of shop drawings for each requirement requested in specification Sections and as Consultant may reasonably request.
10. Submit electronic copies of product data sheets or brochures for requirements requested in specification Sections and as requested by Consultant where shop drawings will not be prepared due to standardized manufacture of product.
11. Submit electronic copies of test reports for requirements requested in specification Sections and as requested by Consultant.
 - 11.1. Report signed by authorized official of testing laboratory that material, product or system identical to material, product or system to be provided has been tested in accord with specified requirements.
12. Submit electronic copies of certificates for requirements requested in specification Sections and as requested by Consultant.
 - 12.1. Statements printed on manufacturer's letterhead and signed by responsible officials of manufacturer of product, system or material attesting that product, system or material meets specification requirements.

- 12.2. Certificates must be dated after award of Contract complete with project name.
13. Submit electronic copies of manufacturers instructions for requirements requested in specification Sections and as requested by Consultant.
 - 13.1. Pre-printed material describing installation of product, system or material, including special notices and Safety Data Sheets concerning impedances, hazards and safety precautions.
14. Submit electronic copies of Operation and Maintenance Data for requirements requested in specification Sections and as requested by Consultant.
15. Delete information not applicable to project.
16. Supplement standard information to provide details applicable to project.
17. If upon review by Consultant, no errors or omissions are discovered or if only minor corrections are made, copies will be returned and fabrication and installation of Work may proceed. If shop drawings are rejected, noted copy will be returned and resubmission of corrected shop drawings, through same procedure indicated above, must be performed before fabrication and installation of Work may proceed.

1.4 Samples

1. Submit for review samples in duplicate as requested in respective specification Sections. Label samples with origin and intended use.
2. Deliver samples prepaid to Consultant's business address.
3. Notify Consultant in writing, at time of submission of deviations in samples from requirements of Contract Documents.
4. Where colour, pattern or texture is criterion, submit full range of samples.
5. Adjustments made on samples by Consultant are not intended to change Contract Price. If adjustments affect value of Work, state such in writing to Consultant before proceeding with Work.
6. Make changes in samples which Consultant may require, consistent with Contract Documents.
7. If a sample is refused, both samples will be returned. If accepted by the Consultant, one sample will be returned, marked "Review without comment."
8. Reviewed and accepted samples will become standard of workmanship and material against which installed Work will be verified.

1.5 Photographic documentation

1. Submit electronic copies of digital photographs in .jpg format as directed by Consultant.
2. Project identification: name and number of project and date of exposure indicated.
3. Frequency of photographic documentation: as directed by Consultant.

1.6 Certificates and transcripts

1. Immediately after award of Contract, submit Workers' Compensation Board status.
2. Submit transcription of insurance immediately after award of Contract.

1.7 Normal and Extended Warranty

1. Submit a normal or extended warranty for the supply and installation of all materials, equipment and workmanship, referred to in the Technical Sections of the Specifications.
2. Unless otherwise noted, submit a normal warranty of one year for all materials, equipment and workmanship, effective from the date of Substantial Completion of works.

1.8 Other Submittals

1. Supply copies of signed contracts with sub-contractors and of purchase orders to materials and equipment suppliers when and if requested by the Consultant.
2. Supply proofs of purchase when and if requested by the Consultant.
3. See Section 01 35 29.06 - Health and Safety Requirements for required submittals concerning health and security.
4. See Section 01 78 00 - Closeout Submittals for submittals at the project closeout.

Part 2 Products

2.1 Not used

1. Not Used.

Part 3 Execution

3.1 Not used

1. Not Used.

End of Section

Section 01 35 29

Health, Safety. and Emergency Response Procedure

Part 1 General

1.1 Related requirements

1. Section 02 81 00 - Hazardous Materials

1.2 Reference standards

1. Canada Labour Code, Part 2, Canada Occupational Safety and Health Regulations
2. Province of British Columbia
 - 2.1. Workers Compensation Act, RSBC 1996 - Updated 2024.
3. Occupational Health & Safety Federal and Provincial Regulations. In case of conflict, the most stringent is to be adhered to.

1.3 Action and informational submittals

1. Submit in accordance with Section 01 33 00 - Submittal Procedures.
2. Submit site-specific Health and Safety Plan: Within seven (7) days after date of Notice to Proceed and prior to commencement of Work. Health and Safety Plan must include:
 - 2.1. Results of site specific safety hazard assessment.
 - 2.2. Results of safety and health risk or hazard analysis for site tasks and operation found in work plan.
3. Submit copies of reports or directions issued by Federal, Provincial and Territorial health and safety inspectors.
4. Submit copies of incident and accident reports.
5. Submit WHMIS Safety Data Sheets (SDS) in accordance with Section 02 81 00 - Hazardous Materials.
6. Owner's Representative will review Contractor's site-specific Health and Safety Plan, to be submitted minimum two weeks prior to mobilization. The Owner's Representative will provide comments to Contractor within ten (10) days after receipt of plan. Revise plan as appropriate and resubmit plan to Owner's Representative within 10 days after receipt of comments from Owner's Representative.
7. Owner's Representative review of Contractor's final Health and Safety plan should not be construed as approval and does not reduce the Contractor's overall responsibility for construction Health and Safety.
8. On-site Contingency and Emergency Response Plan: address standard operating procedures to be implemented during emergency situations.

1.4 Filing of notice

1. File Notice of Project with Provincial authorities prior to beginning of Work.

1.5 Safety assessment

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

1.6 Meetings

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

1.7 Regulatory requirements

1. Do Work in accordance with Section 01 41 00 - Regulatory Requirements.

1.8 Project/site conditions

1. Schedule and administer Health and Safety meeting with the Owner as requested.
2. The Owner reserves the right to demand the implementation of safe work procedures or practices that will ensure at all times the safety completion of the work.

1.9 General requirements

1. Develop written site-specific Health and Safety Plan based on hazard assessment prior to beginning site Work and continue to implement, maintain, and enforce plan until final demobilization from site. Health and Safety Plan must address project specifications.
2. Consultant may respond in writing, where deficiencies or concerns are noted and may request re-submission with correction of deficiencies or concerns.

1.10 Responsibility

1. Be responsible for health and safety of persons on site, safety of property on site and for protection of persons adjacent to site and environment to extent that they may be affected by conduct of Work.
2. Comply with and enforce compliance by employees with safety requirements of Contract Documents, applicable federal, provincial, territorial and local statutes, regulations, and ordinances, and with site-specific Health and Safety Plan.

1.11 Compliance requirements

1. Comply with Workers Compensation Act, B.C. Reg. 296/97.
2. Comply with R.S.Q., c. S-2.1, an Act respecting Health and Safety, and c. S-2.1, r.4 Safety Code for the Construction Industry.
3. Comply with Occupational Health and Safety Regulations, 1996.
4. Comply with Canada Labour Code, Canada Occupational Safety and Health Regulations.

1.12 Unforeseen hazards

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

1.13 Health and safety co-ordinator

1. Employ and assign to Work, competent and authorized representative as Health and Safety Co-ordinator. Health and Safety Co-ordinator must:
 - 1.1. Have site-related working experience specific to activities associated with construction.
 - 1.2. Have working knowledge of occupational safety and health regulations.

- 1.3. Be responsible for completing Contractor's Health and Safety Training Sessions and ensuring that personnel not successfully completing required training are not permitted to enter site to perform Work.
- 1.4. Be responsible for implementing, enforcing daily and monitoring site-specific Contractor's Health and Safety Plan.
- 1.5. Be on site during execution of Work and report directly to and be under direction of site supervisor.

1.14 Posting of documents

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

1.15 Correction of non-compliance

1. Immediately address health and safety non-compliance issues identified by authority having jurisdiction or by Owner.
2. Provide Owner with written report of action taken to correct non-compliance of health and safety issues identified.
3. Owner or Consultant may stop Work if non-compliance of health and safety regulations is not corrected.

1.16 Work stoppage

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

1.17 On-Site Safety Representation

1. It is required that the Contractor appoint a person responsible for the safety of the Contractor's workers (i.e. job superintendent / foreman) who must be present at the job site at all times and their name must be posted at every job entry point.
2. Site Identification - There shall be suitable signs posted at all entry points to the work site identifying the construction site, hard hat area, safety shoe requirements, or any other particular safety requirements. Signs shall be easily read with lettering a minimum of 75 mm (3") high.

1.18 Dress Code

1. In addition to the personal protective clothing required by Provincial Regulations, while working on the site, workers must wear, as minimum, a T-shirt, full-length pants and a hardhat with a visible company logo.

1.19 Housekeeping

1. Refer to Section 01 78 00 - Close-out Submittals, Section 01 74 00 - Cleaning, and Section 01 74 19 Waste Management and Disposal.
2. Further, the Contractor must institute procedures for:
 - 2.1. Storage, dispensing and use of combustible materials,
 - 2.2. Storage of hazardous chemicals,
 - 2.3. Wire management (i.e. extension cords),
 - 2.4. Sanitation of first aid facilities,

2.5. In-house signage to locate office, first aid station, fire fighting equipment, etc.

1.20 Personal Protective Equipment

1. It is the responsibility of the Contractor and the Sub-contractors to develop, implement and post:

1.1. Respiratory protection program, dealing with:

1.1.1. Selection criteria of respirators;

1.1.2. Worker training in use, maintenance and storage of respirators.

1.2. Hearing protection program dealing with:

1.2.1. Selection and use of hearing protectors,

1.2.2. Identification and tagging of sources of noise above 85 dBA (e.g., compressors, jackhammers, etc.)

1.3. Eye protection program dealing with:

1.3.1. Selection and use of eye protectors;

1.3.2. Screening areas around arc welding, etc.

1.4. Other protective equipment and clothing such as gloves, coveralls, fall arresting devices, etc.

Part 2 Products

2.1 Not used

1. Not used.

Part 3 Execution

3.1 Not used

1. Not used.

End of Section

Section 01 35 33

Infection Control Procedures

Part 1 General

1.1 Related documents

1. This section references documents that are integral to the execution of the infection control procedures outlined in this specification. The contractor must adhere to the guidelines, standards, and regulations detailed in these related documents.
 - 1.1. Section 01 33 00: Submittal Procedures
 - 1.2. Section 01 35 29: Health and Safety Requirements
 - 1.3. Section 01 56 00: Temporary Barriers and Hoarding
 - 1.4. Section 01 74 19: Waste Management and Disposal
 - 1.5. Section 01 74 00: Cleaning
 - 1.6. Section 02 41 19.16: Selective Interior Demolition

1.2 Standards and Regulations

1. American Society of Heating, Refrigerating, and Air-Conditioning Engineers (ASHRAE):
Standard 170: Ventilation of Health Care Facilities
2. Canadian Standards Association (CSA):
CSA Z317.2: Special Requirements for Heating, Ventilation, and Air-Conditioning (HVAC) Systems in Health Care Facilities
3. National Fire Protection Association (NFPA)
NFPA 99: Health Care Facilities Code
4. British Columbia Health Authority Guidelines
5. WorkSafeBC Regulations

1.3 Submittals

1. Infection Control Risk Assessment (ICRA): Contractor is required to submit an ICRA before the start of the renovation, outlining identified risks and proposed mitigation strategies.
2. Infection Control Plan (ICP)/ Infection Control Measures (ICM) : Contractor must submit a detailed Infection Control Plan/ Measures, including containment measures, air quality control, dust management, and worker safety protocols.
3. Monitoring Reports: Periodic reports on air quality, containment integrity, and compliance with infection control measures must be submitted to the hospital's infection control officer.

1.4 Risk Assessment

1. Pre-Construction Risk Assessment: Conduct an Infection Control Risk Assessment (ICRA) to identify potential hazards.
2. Classification of Work Areas:
 - 2.1. Nuclear Med Area
Type D
Group 3
Risk Group IV

2.2. MDRD Area (below)

Type D
Group 4
Risk Group IV

1.5 Pre-Construction Activities

1. Ensure the ICRA is fully implemented before any construction begins.
2. Detailed instructions on installing containment barriers, negative pressure systems, and maintaining sealed entry points to prevent cross-contamination.
3. The constructor's on-site team shall include at least one person with demonstrated knowledge and experience in infection prevention and control during construction. Workers not trained in infection control shall not work alone, shall work with trained personnel or be supervised
4. All Worksafe BC regulations are to be followed for safe removal and installation of any lead containing materials. Contractor is responsible to provide a notice of project for lead exposure work, as well as an exposure control plan for NHA review and approval prior to starting any demolition or installation of lead shielding.
5. Risk Reduction Measures for Class 3 and 4 require Infection Prevention and Control Practitioner and project manager review and signature prior to work initiation
6. Personal Protective Equipment (PPE)
 - 6.1. Specific PPE requirements to be followed by workers in different areas. Refer to Section 01 35 29.06 Health and Safety Requirements

1.6 Construction Phase Activities (Class IV)

1. **Dust Control:** Use all methods required to minimize generation and dispersion of dust such as:
 - 1.1. Inform healthcare staff of project in order to identify high-risk patients who may require temporary relocation from construction area.
 - 1.2. Ensure patient care equipment and supplies protected from dust exposure. (May require nursing/department staff to remove/relocate supplies)
 - 1.3. Erect an impermeable dust barrier which includes an anteroom to the construction zone, from true ceiling (includes area above false ceilings) to the floor consisting of two layers of 6 mL polyethylene and a gypsum wallboard layer. When deemed appropriate by the multidisciplinary team, the composition of the barrier may be modified to suit time, space, or impact constraints. The poly membrane shall be present under all circumstances.
 - 1.4. Place walk off dust mat both inside and outside the anteroom.
 - 1.5. Ensure windows, doors, plumbing penetrations, electrical outlets and air supply and return ducts are properly sealed with plastic and taped within the construction / renovation area.
 - 1.6. Post infection control barrier warning signage
 - 1.7. Post risk reduction measures on outside of barrier
 - 1.8. Air ducts and spaces above ceilings should be HEPA vacuumed if necessary.
 - 1.9. Use dust capturing attachments to hose of the HEPA vacuum.
 - 1.10. Control dust by water misting work surfaces while cutting or alternatively use a utility knife.
 - 1.11. Construction workers to wear the appropriate personal protective equipment.
 - 1.12. Construction workers should be HEPA filter vacuumed before leaving the work site; or wear protective clothing that is removed each time; before entering client care areas.

- 1.13. All equipment and supplies must be clean and dry and meet the requirements detailed in the current CSA Z317 standards.
- 1.14. Cutting or coring of concrete slab requires a specific dust management plan: Contractor to add descriptions as required to the NHA Infection Control Risk Reduction Measures- Construction Activity Class IV assessment.
- 1.15. Pulling wire/cables requires a specific dust management plan based on location of wires (ceiling track, conduit, etc.) and population risk group. Contractor to add descriptions as required to the NHA Infection Control Risk Reduction Measures- Construction Activity Class IV assessment.
2. **Traffic Control:**
 - 2.1. Place supplies and equipment in covered containers during transportation through the health care facility.
 - 2.2. In collaboration with the facility project manager designate a traffic pattern for construction workers and debris removal that avoids client care areas, and a traffic pattern for clean or sterile supplies that avoids the construction area.
3. **Ventilation:**
 - 3.1. The work within the MDRD area (beneath the Hawkeye room), can have the negative air recirculated into the adjacent hallway. All infection control procedures need to be followed, but the filtered, clean air, can be recirculated into the adjacent hallway for the lower level work only.
 - 3.2. Disable the ventilation system in the construction/renovation area until project is completed.
 - 3.3. Monitor the need to change and/or clean filters in construction/ renovation area.
 - 3.4. Maintain differential negative pressure 7.5 Pa (0.03 WC) within the construction zone, and negative air pressure 2.5 Pa (0.01 WC) within the anteroom by using certified portable HEPA equipped air filtration units
 - 3.5. Ensure continuous monitoring of negative pressure by using differential monitoring device connected to an alarmed data recorder. The differential monitoring device must be located on the adjacent or exterior side of the barrier; no closer than five meters of the construction site entry.
 - 3.6. Monitoring equipment shall be maintained, zeroed and calibrated in accordance with manufacturers' instructions. The alarm set point for the differential pressure monitoring device shall be established by the MDT. In no case shall the alarm set points be set lower than 2.5 Pa with a maximum alarm delay of 90 s.
 - 3.7. The constructors shall record the pressure differentials in a log sheet daily.
 - 3.8. Construction air handling unit (CAHU) must be performance verified, operated and maintained in accordance with CSA Z317 standards.
 - 3.9. Air exhausted from construction, maintenance, and repair areas must be HEPA filtered, preferably directly outside and away from intake vents.
 - 3.10. Exhaust air shall not be discharged into Risk Group 3 or 4 areas. (measures related to re-circulated air require approval from the MDT).
 - 3.11. If a HEPA filtered vacuum is used as a CAHU, it must meet the CAHU requirements specified in the CSA Z317 standards.
 - 3.12. Ensure ventilation system is functioning properly and is cleaned if contaminated by soil or dust after construction project is complete.
 - 3.13. All opened ductwork must be sealed and remain sealed until installation and completion of connections and/or construction.
 - 3.14. All plumbing & HVAC systems shall be supplied, installed & commissioned in accordance to CSA Z 317.1, CSA Z 317.2 & CAN/CSA Z 8001.

3.15. Ensure ventilation system is functioning properly and is cleaned if contaminated by soil or dust after construction project is complete.

3.16. Ensure ventilation systems are working properly in adjacent areas.

4. Plumbing Activities:

4.1. Inform environmental services and healthcare staff to report any discolored water and/or water leaks to Plant Services.

4.2. Schedule water interruption during lower user activity (e.g., evenings if possible).

4.3. Flush water lines prior to use. Describe methods used to disinfect water lines. Contractor to add descriptions as required to the NHA Infection Control Risk Reduction Measures- Construction Activity Class IV assessment.

4.4. Water temperature meets health care facility requirements.

4.5. Use of water diverter preferred for ceiling leaks in risk group 3 & 4 areas.

4.6. If there are concerns about Legionella, consider hyper-chlorinating stagnant potable water or superheating and flushing all stagnant lines before restoring or re-pressurizing the water system.

4.7. Disinfect domestic water systems (or sections) that have been stagnant in accordance to clause 6.8

4.8. The water lines in the construction area and adjacent client care areas shall be flushed prior to reuse.

4.9. Plumbing materials used in the healthcare facility water systems shall be resistant to build-up of scale and corrosion, and shall not promote the growth of bacteria including Legionella

4.10. Ensure faucet aerators are not installed or used and shall be removed from existing faucets

4.11. Maintain as dry an environment as possible and report any water leaks that occur to walls and substructures.

1.7 Post Construction Activities (Class IV)

1. Debris Removal:

1.1. Appropriate containers supplied by contractor

1.2. Remove debris at the end of the workday via designated route. Describe route (may include external chute): Contractor to add descriptions as required to the NHA Infection Control Risk Reduction Measures- Construction Activity Class IV assessment.

1.3. Contain debris in covered container or cover with moistened sheet before transporting for disposal. Wipe wheels of bins/carts/etc. before entering occupied areas.

2. Clean Up:

2.1. Wet mop and vacuum work area with HEPA filtered vacuums daily and as required.

2.2. Do not remove dust barrier until the project is complete and the area has been cleaned thoroughly and inspected.

2.3. Remove dust barrier carefully by the following methods: HEPA vacuum surfaces; remove barrier and HEPA vacuum again (if practical) and damp wipe surfaces; roll up poly construction side up.

2.4. A final construction clean required at end of project prior to terminal clean by housekeeping department

2.5. Facilities maintenance personnel notifies housekeeping to facilitate cleaning of project zone (includes increased cleaning frequency of areas adjacent to the construction zone and final clean upon completion of project).

3. Evaluation:

3.1. Evaluate infection control prevention measures with other members of the planning team or delegate, to evaluate the effectiveness and identify problems at the end of the construction project.

3.2. Infection prevention and control is consulted whenever problems arise that may result in additional infection risks.

4. Important Reminders:

4.1. If the project scope changes and more extensive work is required, the project Risk Class must be revised and the necessary controls implemented -

4.1.1. Consultation with infection prevention and control practitioner (ICP), multidisciplinary team (MDT) and additional risk reduction measures analysis is required.

4.2. An MDT representative shall regularly visit the construction area to confirm preventive measures followed. Frequency of visits will be determined by the MDT. Visits shall be documented and records retained as part of the risk management documentation for the construction project.

1.8 Documentation and Record Keeping

1. Logs and Records: Keep detailed records of all infection control measures taken, inspections, and incidents.
2. Review and Updates: Regularly update the ICM document to reflect any changes in the construction plan or hospital policies.

End of Section

Section 01 41 00

Regulatory Requirements

Part 1 General

1.1 Summary

1. This Section references laws, bylaws, ordinances, rules, regulations, codes, orders of Authority Having Jurisdiction (AHJ), and other legally enforceable requirements applicable to the Work and that are or become enforced during performance of the Work.

1.2 Definitions

1. Reference Standards: Means consensus standards, trade association standards, guides, and other publications expressly referenced in the Contract Documents.

1.3 Reference standards and reference documents

1. If specified referenced standards do not indicate an edition or version, the latest edition or revision issued by the publisher at the time of bid closing shall apply, except as follows:
 - 1.1. If a particular edition or revision date of a specified standard is referenced in an applicable code or other regulatory requirement, the edition or version in the regulatory reference shall apply.
2. The specified reference standards establish minimum requirements. If Contract Documents indicate requirements that conflict with a reference standard, the more stringent requirements shall apply.
3. If multiple reference standards are specified and the standards establish different requirements, the most stringent requirement shall apply.
4. In case of discrepancy or uncertainties, refer to Consultant for interpretation or clarification.

1.4 Codes

1. Building Code: Perform Work in accordance with the British Columbia Building Code 2024 (BCBC) including amendments up to the time of bid closing and other codes of provincial or local application.
2. Fire Code: Perform Work in accordance with the British Columbia Fire Code 2024 (BCBC) including amendments up to the time of bid closing and other codes of provincial or local application.
3. Energy Code: Perform Work in accordance with the [National Energy Code of Canada for Buildings (NECB)] including amendments up to the time of bid closing and other codes of provincial or local application.
4. Plumbing Code: Perform Work in accordance with British Columbia Plumbing Code 2018 including amendments up to the time of bid closing and other codes of provincial or local application.
5. Accessibility Design for Built Environment: Perform Work in accordance with CSA B651-23, National Standard of Canada- Accessible design for the built Environment including supplements up to the time of bid closing and other codes of provincial or local application.
6. If there is a conflict or discrepancy between codes, the most stringent requirements shall apply.
7. Specific design and performance requirements listed in Specifications and indicated on Drawings may exceed minimum requirements established by referenced Codes; these requirements will govern over the minimum requirements listed in the referenced Codes.

1.5 Fees

1. Regulatory Requirements: Except as otherwise specified, Contractor shall apply for, obtain, and pay fees associated with permits, licenses, certificates, and approvals required by regulatory requirements and Contract Documents, based on General Conditions of Contract and the following:
 - 1.1. Regulatory requirements and fees in force at the time of bid closing, and
 - 1.2. A change in regulatory requirements or fees scheduled to become effective after the time of bid closing and of which public notice has been given before the time of bid closing.

Part 2 Products

2.1 Easements and notices

1. Owner will obtain permanent easements and rights of servitude that may be required for performance of the Work.
2. Contractor shall give notices required by regulatory requirements.

2.2 Permit requirements

1. Building Permit:
 - 1.1. Contractor shall apply for, obtain and pay for building permit on behalf of Owner, and other permits required for Work and its various parts.
 - 1.2. Owner has applied for and will be paying for building permit. Contractor is responsible for obtaining or coordinating other permits required for Work and its various parts.
 - 1.3. Contractor will require that specific Subcontractors obtain and pay for some permits required by authorities having jurisdiction (AHJ), where their work is affected by work requiring permits including asbestos abatement and control permits.
 - 1.4. Contractor shall display building permit and other permits in a conspicuous location at the Place of the Work.
2. Occupancy Permits:
 - 2.1. Contractor shall apply for, obtain, and pay for occupancy permits, including partial occupancy permits where required by AHJ.
 - 2.2. Contractor shall correct deficiencies in accordance with Consultant's instructions. If a deficiency is not corrected, the Owner reserves the right to make correction and charge Contractor for costs incurred.
 - 2.3. Contractor shall turn occupancy permits over to Owner.

Part 3 Execution

3.1 Not used

1. Not Used.

End of Section

Section 01 43 00

Quality Assurance

Part 1 General

1.1 Section includes

1. This Section describes administrative and procedural requirements for proactive Contractor activities to assure the quality of construction before and during execution of the Work.

1.2 Definitions

1. Mock-up: A full-size physical example that demonstrates materials, finishes, interrelationship of materials and assemblies, aesthetic effects, and execution. A mock-up may demonstrate coordination of multiple Subcontractors' work. A mock-up establishes a standard by which the Work will be judged. Mock-ups are not samples.
2. Quality Assurance: Procedures for preventing defects and deficiencies before and during execution of the Work.
3. Quality Audit: Systematic and independent examination to determine whether [quality requirements](#) have been fulfilled as planned. A quality audit will examine processes, products and services to determine if they have been implemented effectively to achieve their specified objective.

1.3 Reference standards

1. ASTM International (ASTM):
 - 1.1. [ASTM E329-20 Standard Specification for Agencies Engaged in Construction Inspection, Testing, or Special Inspection](#)
2. International Organization for Standardization (ISO):
 - 2.1. ISO 9001: 2015, Quality Management Systems - Requirements

1.4 Administrative requirements

1. Contractor is responsible for self-performed testing and submittal of test reports to Consultant.

1.5 Action and informational submittals

1. Submit in accordance with Section 01 33 00 - Submittal Procedures.
2. Submit formal testing and inspections reports per [ASTM E329](#) as indicated in technical specification Sections to Consultant in accordance with contractual agreement.
3. Submit one (1) digital copy of each quality assurance inspection and test report to Consultant, except where a technical specification Section indicates otherwise.

1.6 Qualifications

1. Manufacturers' Qualifications:
 - 1.1. specializes in manufacturing the products specified in the technical Section of the Project's construction specification.
 - 1.2. minimum 3 years documented experience with a record of successful performance
2. Suppliers' Qualifications:
 - 2.1. authorized to distribute manufacturer's products

- 2.2. has capacity to supply required products without delaying the Project
- 3. Fabricators' Qualifications:
 - 3.1. experienced in producing products required for this Project
 - 3.2. successful record of in-service performance
 - 3.3. sufficient production capacity to fabricate required products without delaying the Project
- 4. Installer Qualifications:
 - 4.1. firm or individual experienced in design and installation, application, and erection of materials to the extent required for this Project
 - 4.2. successful record of in-service performance
- 5. Testing and Inspecting Agency Qualifications:
 - 5.1. accredited organizations by the Standards Council of Canada for testing and inspection
 - 5.2. capable of reliably performing testing of building products and inspections of construction activities in accordance with [ASTM E329](#).
- 6. Licensed Professionals Qualifications:
 - 6.1. individual registered or licensed to practice their respective design profession as defined by the statutory requirements of the professional registration laws of the state or jurisdiction in which the project is to be constructed.

1.7 Certifications

- 1. Ensure that certification of products, processes, and systems includes physical and examination testing as specified in [ASTM E329](#) to confirm compliance with Specifications requirements.

1.8 Coordination

- 1. Coordinate and schedule tests and inspections with accredited agencies as indicated in Contract Documents and in accordance with ASTM E329 requirements.
- 2. Coordinate testing and inspections schedule with sub-contractor, testing agencies, and other affected parties.

1.9 Mock-ups

- 1. Mock-ups can be used as a reference for assessing quality of workmanship and site-applied finishes as requested in the project's Contract Documents.
- 2. Obtain Consultant's acceptance of mock-ups installation before beginning to install those portions of the Work represented by the mock-up.
- 3. Assemble mock-ups at the Place of the Work in locations acceptable to Consultant, or where location is indicated in the technical specification Section.
- 4. Schedule mock-ups ready for Consultant 's review and in orderly sequence, to avoid delays in Work.
 - 4.1. Failure to prepare mock-ups in ample time is not considered sufficient reason to request an extension of Contract Time. Claims for extension of Contract Time by reason of such default will not be considered.
- 5. If requested, Consultant will assist in scheduling dates for construction of mock-ups.
- 6. Construct mock-ups using materials, finishes, colours, and methods proposed for the completed Work. Mock-ups to demonstrate proposed workmanship and range of aesthetic appearance.
- 7. Where a mock-up represents or affects multiple specification Sections, coordinate activities of these Subcontractors to ensure mock-ups are complete.
- 8. Modify or replace mock-ups when unacceptable to Consultant.

9. Maintain acceptable mock-ups in an undisturbed condition as a standard for judging the completed Work.

Part 2 Products

2.1 Not used

1. Not Used.

Part 3 Execution

3.1 Not used

1. Not Used.

End of Section

Section 01 45 00

Quality Control

Part 1 General

1.1 Summary

1. This Section describes administrative and procedural requirements for reactive activities to verify that completed Work conforms to Contract Documents requirements.
2. Having inspection and testing agencies by Contractor or Owner does not relieve the Contractor of their responsibility to perform Work in accordance with Contract Documents.

1.2 Related requirements

1. Section 01 33 00 - Submittal Procedures
2. Section 01 92 00 - Facility Operation
3. Canadian Construction Documents Committee (CCDC)
 - 3.1. CCDC 2-2020, Stipulated Price Contract.

1.3 Administrative requirements

1. Cash Allowances for independent inspection and testing services to be retained and paid for by the Contractor as described in Section 01 21 00 - Allowances. This Cash Allowance(s) excludes any inspection and testing that is for the Contractor's own quality control, and excludes inspection and testing required by authority having jurisdiction.
2. Allow and coordinate access to Work on site, manufacturing off site, and fabrication off site with inspection and testing agencies.
3. Retain and pay for inspection and testing that are designated for Contractor's own quality control plan, and when testing and inspection are required by AHJ..
4. Give advanced notice to Consultant and to each inspection/testing agency for inspection and testing required by Contract Documents or by AHJ.
5. In advance of each test, notify appropriate agency and Consultant in the order that attendance arrangements can be made.

1.4 Action and informational submittals

1. Submit in accordance with Section 01 33 00 - Submittal Procedures.
2. Submit schedule of testing and inspection activities to Consultant, Owner, applicable Subcontractors, testing agencies, and other affected parties. Include the following:
 - 2.1. List each testing and inspection agency
 - 2.2. Identify types of tests and inspections for each agency, and cross reference to applicable specification Section number-title in Contract Documents
 - 2.3. Description of test and inspection
 - 2.4. Identify applicable reference standard
 - 2.5. Identify test and inspection method
 - 2.6. Indicate number of each test and inspection required

3. Submit one digital copy of each quality assurance inspection and test report to Consultant, except where a technical specification Section indicates otherwise.
4. Submit reports for inspection and testing required by Contract Documents or by AHJ and performed by Contractor-retained inspection and testing agencies within ten days after inspection or test is completed, except where a technical specification Section indicates a different time period.
5. Submit one digital copy of each quality control inspection and test report to Consultant, except where a technical specification Section indicates otherwise.
6. Deliver copies of quality control reports to Subcontractor of work being inspected or tested.

1.5 Site quality control procedures

1. Provide labour, Construction Equipment, and temporary facilities to obtain and handle test samples and materials on site. Arrange for sufficient space to store and cure test samples.
2. Deliver samples and materials required for testing, as requested in technical specification Sections. Submit with reasonable promptness and in an orderly sequence to avoid delays in Work.

1.6 Testing and inspection services

1. Refer to CCDC 2, GC 2.3.
2. Owner will retain and pay for independent inspection and testing agencies to inspect, test, or perform other quality control reviews of parts of the work, except where indicated otherwise.
3. Provide equipment required for executing inspection and testing by appointed agencies.
4. Correct defects and deficiencies when they are revealed during inspection or testing as advised by Consultant at no change to Contract Price or Contract Time. Pay costs for retesting and re-inspection. Appointed agency will request additional inspections or tests to ensure full degree of defects or deficiencies are revealed and corrected.
5. Quality control testing and inspection reports to include the following:
 - 5.1. Project name and number
 - 5.2. Testing/Inspection agency's name, address, telephone number, and website
 - 5.3. Date of issuing report
 - 5.4. Dates and locations of tests, inspections, or samples
 - 5.5. Description of the Work and test and inspection method
 - 5.6. Numbers and titles of associated specification Sections
 - 5.7. Test and inspection data and interpretation of test results (e.g., pass or fail)
 - 5.8. Ambient conditions at time of test, inspection, or sampling
 - 5.9. Recommendations on re-testing and re-inspecting, if applicable

Part 2 Products

2.1 Not used

1. Not Used.

Part 3 Execution

3.1 Not used

1. Not Used.

End of Section

Section 01 51 00

Temporary Utilities

Part 1 General

1.1 Action and informational submittals

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

1.2 Temporary electricity

1. Provide and pay for temporary electricity for lighting and operating of power tools during construction to a maximum supply of [230] volts [30] amps.
2. Arrange for connection with appropriate utility company. Pay costs for installation, maintenance, and removal.
3. Temporary electricity for electric cranes and other equipment requiring a supply in excess of above is responsibility of Contractor and based on General Conditions of Contract.
4. Electrical power systems installed under this Contract may be used for construction requirements only with prior approval from Consultant if warranties are not affected.
 - 4.1. Repair damage to electrical system caused by use under this Contract.

1.3 Temporary fire protection

1. Provide and maintain temporary fire protection equipment during performance of Work required by insurance companies having jurisdiction and governing codes, regulations and bylaws.

1.4 Temporary heating cooling and ventilating

1. Provide temporary heating as required during construction period, including attendance, maintenance and fuel.
2. Construction heaters used inside building must be vented to outside or be of the flameless (vent free) type. Solid fuel salamanders are not permitted.
3. Provide temporary heat and ventilation in enclosed areas as required to:
 - 3.1. Facilitate progress of Work.
 - 3.2. Protect Work and Products against dampness and cold.
 - 3.3. Prevent moisture and condensation on surfaces.
 - 3.4. Provide ambient temperatures and humidity levels for storage, installation, and curing of materials.
 - 3.5. Provide adequate ventilation to meet health regulations for safe working environment.
4. Maintain minimum temperatures of 10 °C in areas where construction is in progress.
5. Ventilating:
 - 5.1. Prevent accumulations of dust, fumes, mists, vapours, or gases in occupied areas during construction.
 - 5.2. Provide local exhaust ventilation to prevent harmful accumulation of hazardous substances into atmosphere of occupied areas.
 - 5.3. Dispose of exhaust materials in a manner that will not result in harmful exposure to persons.
 - 5.4. Ventilate storage spaces containing hazardous or volatile materials.

- 5.5. Ventilate temporary sanitary facilities.
- 5.6. Continue operating ventilation and exhaust system after cessation of work process until complete removal of harmful contaminants is ensured.
- 6. Permanent heating, ventilating, and air conditioning system of building, may not be used. Be responsible for damage to systems if use is permitted.
- 7. Ensure Date of Substantial Performance and Warranties for heating system does not start until entire system is in as near original condition as possible and is certified by Consultant.
- 8. Pay costs for maintaining temporary heat when using permanent heating system.
- 9. Maintain strict supervision of operation of temporary heating and ventilating equipment to:
 - 9.1. Conform with applicable codes and standards.
 - 9.2. Enforce safe practices.
 - 9.3. Prevent abuse of services.
 - 9.4. Prevent damage to finishes.
 - 9.5. Vent direct-fired combustion units to outside.
- 10. Be responsible for damage to Work due to failure to provide adequate heat and protection during construction.

1.5 Temporary lighting

- 1. Provide and maintain temporary lighting throughout Project. Ensure level of illumination on all floors and stairs is not less than 162 lx.
- 2. Electrical lighting systems installed under this Contract may be used for construction requirements only with prior approval of Consultant if warranties are not affected.
 - 2.1. Repair damage to lighting systems caused by use under this Contract.
 - 2.2. Replace lamps that have been used for more than 3 months.

1.6 Temporary telecommunications

- 1. Provide and pay for temporary telephone fax data hook up and line s necessary for own use and use of Consultant.

1.7 Temporary water

- 1. Provide continuous supply of potable water for construction use.
- 2. Arrange for connection with appropriate utility company and pay costs for installation, maintenance, and removal.
- 3. Pay for utility charges at prevailing rates, based on General Conditions of Contract.

Part 2 Products

2.1 Not used

- 1. Not Used.

Part 3 Execution

3.1 Installation and removal

- 1. Provide temporary utilities to execute Work expeditiously.
- 2. Remove all such temporary utilities from site after use.

End of Section

Section 01 52 00

Construction Facilities

Part 1 General

1.1 Related requirements

1. Section 02 41 19.16 - Selective Interior Demolition.
2. Section 08 14 00- Wood Doors
3. Section 08 71 00- Door Hardware
4. Section 09 91 00.08 - Painting for Minor Works

1.2 Reference standards

1. Canadian Construction Documents Committee (CCDC)
 - 1.1. CCDC 2-2020, Stipulated Price Contract.
2. Canada Green Building Council (CaGBC)
 - 2.1. LEED Canada-NC Version 5.0-2024, LEED (Leadership in Energy and Environmental Design): Green Building Rating System Reference Package For New Construction and Major Renovations.
 - 2.2. LEED Canada-CI Version 5.0-2024, LEED (Leadership in Energy and Environmental Design): Green Building Rating System Reference Guide For Commercial Interiors.
3. Canadian General Standards Board (CGSB)
 - 3.1. [CAN/CGSB 1.189-00](#), Exterior Alkyd Primer for Wood.
 - 3.2. [CGSB 1.59-97](#), Alkyd Exterior Gloss Enamel.
4. CSA Group (CSA)
 - 4.1. [CSA-A23.1/A23.2-04](#), Concrete Materials and Methods of Concrete Construction/Methods of Test and Standard Practices for Concrete.
 - 4.2. CSA-0121-M1978(R2003), Douglas Fir Plywood.
 - 4.3. [CAN/CSA-S269.2-M1987\(R2003\)](#), Access Scaffolding for Construction Purposes.
 - 4.4. [CAN/CSA-Z321-96\(R2001\)](#), Signs and Symbols for the Occupational Environment.
5. Public Works Government Services Canada (PWGSC) Standard Acquisition Clauses and Conditions (SACC)-ID: R0202D, Title: General Conditions 'C', In Effect as of: May 14, 2004.
6. United States Environmental Protection Agency (EPA) / Office of Water
 - 6.1. EPA 832R92005, Storm Water Management for Construction Activities: Developing Pollution Prevention Plans and Best Management Practices.

1.3 Action and informational submittals

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

1.4 Installation and removal

1. Prepare site plan indicating proposed location and dimensions of area to be fenced and used by Contractor, number of trailers to be used, avenues of ingress/egress to fenced area and details of fence installation.

2. Identify areas which have to be gravelled to prevent tracking of mud.
3. Indicate use of supplemental or other staging area.
4. Provide construction facilities in order to execute work expeditiously.
5. Remove from site all such work after use.

1.5 Site storage/loading

1. Refer to CCDC 2.
2. Confine work and operations of employees by Contract Documents. Do not unreasonably encumber premises with products.
3. Do not load or permit to load any part of Work with weight or force that will endanger Work.

1.6 Security

1. Provide and pay for responsible security personnel to guard site and contents of site after working hours and during holidays.

1.7 Offices

1. Provide office heated to 22 degrees C, lighted 750 lx and ventilated, of sufficient size to accommodate site meetings and furnished with drawing laydown table.
2. Provide marked and fully stocked first-aid case in a readily available location.
3. Subcontractors to provide their own offices as necessary. Direct location of these offices.

1.8 Equipment, tool and materials storage

1. Provide and maintain, in clean and orderly condition, lockable weatherproof sheds for storage of tools, equipment and materials.
2. Locate materials not required to be stored in weatherproof sheds on site in manner to cause least interference with work activities.

1.9 Sanitary facilities

1. Provide sanitary facilities for work force in accordance with governing regulations and ordinances.
2. Post notices and take precautions as required by local health authorities. Keep area and premises in sanitary condition.
3. When permanent water and drain connections are completed, provide temporary water closets and urinals complete with temporary enclosures, inside building. Permanent facilities may be used on approval of Departmental Representative.

1.10 Construction signage

1. Provide and erect project sign, within three weeks of signing Contract, in a location designated by Consultant.
2. Indicate on sign, name of Owner, and Contractor and Subcontractor, of design style as detailed established by Departmental Representative.
3. No other signs or advertisements, other than warning signs, are permitted on site.
4. Direct requests for approval to erect Consultant/Contractor signboard to Departmental Representative. For consideration general appearance of Consultant/Contractor signboard must conform to project identification site sign. Wording in both official languages.

5. Signs and notices for safety and instruction in both official languages Graphic symbols to [CAN/CSA-Z321](#).
6. Maintain approved signs and notices in good condition for duration of project, and dispose of off site on completion of project or earlier if directed by Consultant.

1.11 Protection and maintenance of traffic

1. Protect travelling public from damage to person and property.
2. Dust control: adequate to ensure safe operation at all times.

1.12 Clean-up

1. Remove construction debris, waste materials, packaging material from work site daily.
2. Clean dirt or mud tracked onto paved or surfaced roadways.
3. Store materials resulting from demolition activities that are salvageable.
4. Stack stored new or salvaged material not in construction facilities.

Part 2 Products

2.1 Not used

1. Not Used.

Part 3 Execution

3.1 Not Used

1. Not Used.

End of Section

Section 01 56 00

Temporary Barriers and Enclosures

Part 1 General

1.1 Related requirements

1. Section 02 41 19.16 Selective Interior Demolition.

1.2 Reference standards

1. Canadian General Standards Board (CGSB)
 - 1.1. [CGSB 1.59-97](#), Alkyd Exterior Gloss Enamel.
 - 1.2. [CAN/CGSB 1.189-00](#), Exterior Alkyd Primer for Wood.
2. CSA Group (CSA)
 - 2.1. [CSA-O121-M1978\(R2003\)](#), Douglas Fir Plywood.
3. Public Works Government Services Canada (PWGSC) Standard Acquisition Clauses and Conditions (SACC)-ID: R0202D, Title: General Conditions 'C', In Effect as Of: May 14, 2004.

1.3 Installation and removal

1. Provide temporary controls in order to execute Work expeditiously.
2. Remove from site all such work after use.

1.4 Hoarding

1. Erect temporary site enclosures as per CSA Z317.13:22, Infection control during construction, renovation, and maintenance of health care facilities. If hoarding is shown on the architectural drawings, they are a guide only, the hoarding is the general contractor's responsibility.
2. Erect and maintain pedestrian walkways including roof and side covers, complete with signs and electrical lighting as required by law.
3. Paint public side of site enclosure in selected colours with one coat primer to [CAN/CGSB 1.189](#) and one coat exterior paint to [CGSB 1.59](#). Maintain public side of enclosure in clean condition.

1.5 Dust tight screens

1. Provide dust tight screens or insulated partitions to localize dust generating activities, and for protection of workers, finished areas of Work and public.
2. Maintain and relocate protection until such work is complete.

1.6 Access to site

1. Provide and maintain access roads, sidewalk crossings, ramps and construction runways as may be required for access to Work.

1.7 Public traffic flow

1. Provide and maintain competent signal flag operators, traffic signals, barricades and flares, lights, or lanterns as required to perform Work and protect public.

1.8 Fire routes

1. Maintain access to property including overhead clearances for use by emergency response vehicles.

1.9 Protection for off-site and public property

1. Protect surrounding private and public property from damage during performance of Work.
2. Be responsible for damage incurred.

1.10 Protection of building finishes

1. Provide protection for finished and partially finished building finishes and equipment during performance of Work.
2. Provide necessary screens, covers, and hoardings.
3. Confirm with Departmental Representative locations and installation schedule 3 days prior to installation.
4. Be responsible for damage incurred due to lack of or improper protection.

1.11 Waste management and disposal

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

Part 2 Products

2.1 Not used

1. Not Used.

Part 3 Execution

3.1 Not used

1. Not Used.

End of Section

Section 01 61 00

Common Product Requirements

Part 1 General

1.1 Reference standards

1. Canadian Construction Documents Committee (CCDC)
 - 1.1. CCDC 2-2020, Stipulated Price Contract.
2. Within text of each specifications section, reference may be made to reference standards. Conform to these reference standards, in whole or in part as specifically requested in specifications.
3. If there is question as to whether products or systems are in conformance with applicable standards, Consultant reserves right to have such products or systems tested to prove or disprove conformance.
4. Cost for such testing will be born by Owner's Representative in event of conformance with Contract Documents or by Contractor in event of non-conformance.

1.2 Quality

1. Refer to CCDC 2.
2. Products, materials, equipment and articles incorporated in Work shall be new, not damaged or defective, and of best quality for purpose intended. If requested, furnish evidence as to type, source and quality of products provided.
3. Defective products, whenever identified prior to completion of Work, will be rejected, regardless of previous inspections. Inspection does not relieve responsibility, but is precaution against oversight or error. Remove and replace defective products at own expense and be responsible for delays and expenses caused by rejection.
4. Should disputes arise as to quality or fitness of products, decision rests strictly with Consultant based upon requirements of Contract Documents.
5. Unless otherwise indicated in specifications, maintain uniformity of manufacture for any particular or like item throughout building.
6. Permanent labels, trademarks and nameplates on products are not acceptable in prominent locations, except where required for operating instructions, or when located in mechanical or electrical rooms.

1.3 Availability

1. Immediately upon signing Contract, review product delivery requirements and anticipate foreseeable supply delays for items. If delays in supply of products are foreseeable, notify Consultant of such, in order that substitutions or other remedial action may be authorized in ample time to prevent delay in performance of Work.
2. In event of failure to notify Consultant at commencement of Work and should it subsequently appear that Work may be delayed for such reason, Consultant reserves right to substitute more readily available products of similar character, at no increase in Contract Price or Contract Time.

1.4 Storage, handling and protection

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

2. Store packaged or bundled products in original and undamaged condition with manufacturer's seal and labels intact. Do not remove from packaging or bundling until required in Work.
3. Store products subject to damage from weather in weatherproof enclosures.
4. Store cementitious products clear of earth or concrete floors, and away from walls.
5. Keep sand, when used for grout or mortar materials, clean and dry. Store sand on wooden platforms and cover with waterproof tarpaulins during inclement weather.
6. Store sheet materials, lumber on flat, solid supports and keep clear of ground. Slope to shed moisture.
7. Store sheet materials, lumber on flat, solid supports and keep clear of ground. Slope to shed moisture.
8. Store and mix paints in heated and ventilated room. Remove oily rags and other combustible debris from site daily. Take every precaution necessary to prevent spontaneous combustion.
9. Remove and replace damaged products at own expense and to satisfaction of Consultant.
10. Touch-up damaged factory finished surfaces to Consultant's satisfaction. Use touch-up materials to match original. Do not paint over name plates.

1.5 Transportation

1. Pay costs of transportation of products required in performance of Work.
2. Transportation cost of products supplied by Owner will be paid for by Owner's Representative. Unload, handle and store such products.

1.6 Manufacturer's instructions

1. Unless otherwise indicated in specifications, install or erect products in accordance with manufacturer's instructions. Do not rely on labels or enclosures provided with products. Obtain written instructions directly from manufacturers.
2. Notify Consultant in writing, of conflicts between specifications and manufacturer's instructions, so that Consultant will establish course of action.
3. Improper installation or erection of products, due to failure in complying with these requirements, authorizes Consultant to require removal and re-installation at no increase in Contract Price or Contract Time.

1.7 Quality of work

1. Ensure Quality of Work is of highest standard, executed by workers experienced and skilled in respective duties for which they are employed. Immediately notify Consultant if required Work is such as to make it impractical to produce required results.
2. Do not employ anyone unskilled in their required duties. Owner's Representative reserves right to require dismissal from site, workers deemed incompetent or careless.
3. Decisions as to standard or fitness of Quality of Work in cases of dispute rest solely with Consultant, whose decision is final.

1.8 Co-ordination

1. Ensure co-operation of workers in laying out Work. Maintain efficient and continuous supervision.
2. Be responsible for coordination and placement of openings, sleeves and accessories.

1.9 Concealment

1. In finished areas conceal pipes, ducts and wiring in floors, walls and ceilings, except where indicated otherwise.
2. Before installation inform Consultant if there is interference. Install as directed by Consultant.

1.10 Remedial work

1. Refer to CCDC 2 and Section 01 73 00 - Execution Requirements.
2. Perform remedial work required to repair or replace parts or portions of Work identified as defective or unacceptable. Co-ordinate adjacent affected Work as required.
3. Perform remedial work by specialists familiar with materials affected. Perform in a manner to neither damage nor put at risk any portion of Work.

1.11 Location of fixtures

1. Consider location of fixtures, outlets, and mechanical and electrical items indicated as approximate.
2. Inform Consultant of conflicting installation. Install as directed.

1.12 Fastenings

1. Provide metal fastenings and accessories in same texture, colour and finish as adjacent materials, unless indicated otherwise.
2. Prevent electrolytic action between dissimilar metals and materials.
3. Use non-corrosive hot dip galvanized steel fasteners and anchors for securing exterior work, unless stainless steel or other material is specifically requested in affected specification Section.
4. Space anchors within individual load limit or shear capacity and ensure they provide positive permanent anchorage. Wood, or any other organic material plugs are not acceptable.
5. Keep exposed fastenings to a minimum, space evenly and install neatly.
6. Fastenings which cause spalling or cracking of material to which anchorage is made are not acceptable.

1.13 Fastenings - equipment

1. Use fastenings of standard commercial sizes and patterns with material and finish suitable for service.
2. Use heavy hexagon heads, semi-finished unless otherwise specified. Use No. 304 stainless steel for exterior areas.
3. Bolts may not project more than one diameter beyond nuts.
4. Use plain type washers on equipment, sheet metal and soft gasket lock type washers where vibrations occur. Use resilient washers with stainless steel.

1.14 Protection of work in progress

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

1.15 Existing utilities

1. When breaking into or connecting to existing services or utilities, execute Work at times directed by local governing authorities, with minimum of disturbance to Work, and/or building occupants.

2. Protect, relocate or maintain existing active services. When services are encountered, cap off in manner approved by authority having jurisdiction. Stake and record location of capped service.

Part 2 Products

2.1 Not used

1. Not Used.

Part 3 Execution

3.1 Not used

1. Not Used.

End of Section

Section 01 73 00

Execution

Part 1 General

1.1 Section includes

1. Common requirements for installing, applying, and erecting products. Includes procedures and submittals for cutting and patching to existing conditions, and required repairs arising from tests and destructive inspections.

1.2 Action and informational submittals

1. Submit in accordance with Section 01 33 00 - Submittal Procedures.
2. Submit proof of anchor and fastener load carrying capacity for a work result, when requested.
3. Submit written request before cutting or altering to existing conditions which may affect the following:
 - 3.1. structural integrity of existing elements: Submit structural details and calculations performed by a professional structural engineer registered or licensed in BC, Canada. Include evidence of unsatisfactory structural integrity of the elements according to Departmental Representative.
 - 3.2. integrity of weather-exposed and moisture-resistant elements
 - 3.3. efficiency, maintenance, safety, or accessibility of operational elements
 - 3.4. visual qualities of sight-exposed elements.
 - 3.5. Work of Owner and other contractor(s)
4. Submit a request for cutting or altering which includes:
 - 4.1. identification of the Project; and
 - 4.2. location and description of affected existing conditions including changes to structural elements, function of elements, and visual appearance of existing elements; and the location and identification of utilities that will be temporarily out of service during cutting and patching activities.
5. Submit site plan drawings indicating relative location of various services and equipment upon the request of Departmental Representative.
6. Submit a work plan including:
 - 6.1. a statement why cutting or altering is unavoidable and describe alternatives to cutting and patching if available;
 - 6.2. a description of proposed work and proposed Products;
 - 6.3. the effect of cutting or altering on work by Owner or other contractors;
 - 6.4. written acknowledgement by other contractors affected by cutting or altering, if applicable; and
 - 6.5. proposed date(s) and time(s) work will be executed.

1.3 Qualifications

1. Licensed Professionals: Engage a structural engineer licensed at the Place of the Work, to submit details and calculations when altering existing structural elements.

Part 2 Products

2.1 Materials

1. Patching Materials: If possible, use the same materials found in the existing conditions, except in fire-resistance rated materials and assemblies.
2. Materials Visible from the Floor Area: Use materials that visually match existing adjacent surfaces, and match existing functional performance.

Part 3 Execution

3.1 Common installation/application/erection requirements

1. Fit several parts together, to integrate with other Work.
2. Remove and replace defective and non-conforming Work.
3. Unless otherwise indicated in specifications, install, or erect products in accordance with manufacturer's instructions. Do not rely on labels or enclosures provided with products. Obtain written instructions directly from manufacturers.
4. Notify Consultant in writing, of conflicts between specifications and manufacturer's instructions, so that Consultant will establish course of action.
5. Improper installation or erection of products, due to failure in complying with these requirements, authorizes Departmental Representative to require removal and re-installation at no increase in Contract Price or Contract Time.
6. Provide openings in non-structural elements for penetrations of mechanical and electrical work.
7. Conceal pipes, ducts and wiring in floor, wall, partition, and ceiling assemblies in finished areas, except where indicated otherwise.
8. In addition to the manufacturer's recommendations for safety, access, accessibility, and maintenance, locate equipment, fixtures, and distribution systems where it shall provide minimal interference and shall maximize on usable space.
 - 8.1. Location of equipment, fixtures, and outlets indicated on Drawings and specifications are approximate.
 - 8.2. Notify Departmental Representative of impending installation and obtain approval for actual locations.

3.2 Bracing and anchoring

1. Anchors and Fasteners: Unless otherwise indicated elsewhere:
 - 1.1. Provide any necessary anchors and fasteners to fasten each component securely for its intended purpose. Allow for building movement, including from thermal expansion and contraction of materials and assemblies;
 - 1.2. prevent electrolytic reaction between dissimilar metals and materials;
 - 1.3. Provide hot-dip galvanized steel anchors and fasteners for securing exterior work;
 - 1.4. locate anchors and fasteners within individual load limit or shear capacity. Ensure anchors and fasteners are permanently secured;
 - 1.5. Where exposed to view, evenly distribute anchors and fasteners in a single area; and
 - 1.6. Where exposed to view, provide metal anchors, fasteners, and related accessories with the same texture, colour, and finish as adjacent materials.
2. Non-Conforming Work: Anchors and fasteners installed which cause substrate cracks or spalling is not acceptable.

3.3 Cutting and patching

1. Proceed with cutting and patching after the review and acceptance by the Consultant of all submittals listed in Article 1.03, Actions and Informational Submittals.
2. Perform cutting, fitting, and patching including excavation and fill, to complete Work in accordance with related technical specification Sections.
3. Use special techniques to avoid damaging existing conditions that will remain, and which will result in proper surfaces to receive patching and finishing.
4. Employ original installer to perform cutting and patching for weather-exposed elements, moisture-resistant elements, and surfaces exposed to view.
5. Cut rigid materials using masonry saw, core drill, or other tool recommended by the product manufacturer or applicable industry association. Pneumatic or impact tools are not allowed on masonry work without the approval of Consultant.
6. Fit Work airtight to pipes, sleeves, ducts, conduit, and other penetrations through surfaces.
7. Refinish surfaces to match adjacent finishes. Refinish continuous surfaces to nearest intersection (e.g., edges of partition). Refinish assemblies by refinishing entire unit. Provide entire surface with uniform finish, colour, and texture.

3.4 Adjusting

1. Remove and replace patching that is visually unsatisfactory to Consultant.

End of Section

Section 01 74 00

Cleaning

Part 1 General

1.1 Related requirements

1. Section 01 74 19 - Waste Management and Disposal.

1.2 Reference standards

1. Canadian Construction Documents Committee (CCDC)
 - 1.1. CCDC 2-2020, Stipulated Price Contract.

1.3 Project cleanliness

1. Maintain Work in tidy condition, free from accumulation of waste products and debris, including that caused by Owner or other Contractors.
2. Remove waste materials from site at daily regularly scheduled times or dispose of as directed by Departmental Representative. Do not burn waste materials on site, unless approved by Departmental Representative.
3. Clear snow and ice from access to building, bank/pile snow in designated areas only.
4. Make arrangements with and obtain permits from authorities having jurisdiction for disposal of waste and debris.
5. Provide on-site the required number of 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 and Disposal.
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.
12. Schedule cleaning operations so that resulting dust, debris and other contaminants will not fall on wet, newly painted surfaces nor contaminate building systems.

1.4 Final cleaning

1. Refer to CCDC 2 , GC 3.14.
2. When Work is Substantially Performed remove surplus products, tools, construction machinery and equipment not required for performance of remaining Work.
3. Remove waste products and debris other than that caused by others, and leave Work clean and suitable for occupancy.
4. Prior to final review remove surplus products, tools, construction machinery and equipment.

5. Remove waste products and debris including that caused by Owner or other Contractors.
6. Remove waste materials from site at regularly scheduled times or dispose of as directed by Departmental Representative. Do not burn waste materials on site, unless approved by Departmental Representative.
7. Make arrangements with and obtain permits from authorities having jurisdiction for disposal of waste and debris.
8. Clean and polish glass, mirrors, hardware, wall tile, stainless steel, chrome, porcelain enamel, baked enamel, plastic laminate, and mechanical and electrical fixtures. Replace broken, scratched or disfigured glass.
9. Remove stains, spots, marks and dirt from decorative work, electrical and mechanical fixtures, furniture fitments, walls, and floors.
10. Clean lighting reflectors, lenses, and other lighting surfaces.
11. Vacuum clean and dust building interiors, behind grilles, louvres and screens.
12. Wax, seal, shampoo or prepare floor finishes, as recommended by manufacturer.
13. Inspect finishes, fitments and equipment and ensure specified workmanship and operation.
14. Broom clean and wash exterior walks, steps and surfaces; rake clean other surfaces of grounds.
15. Remove dirt and other disfiguration from exterior surfaces.
16. Clean and sweep roofs, gutters, areaways, and sunken wells.
17. Sweep and wash clean paved areas.
18. Clean equipment and fixtures to sanitary condition; clean or replace filters of mechanical equipment.
19. Clean roofs, downspouts, and drainage systems.
20. Remove debris and surplus materials from crawl areas and other accessible concealed spaces.
21. Remove snow and ice from access to building.

1.5 Waste management and disposal

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

Part 2 Products

2.1 Not used

1. Not Used.

Part 3 Execution

3.1 Not used

1. Not Used.

End of Section

Section 01 74 19

Waste Management and Disposal

Part 1 General

1.1 Summary

1. This Section includes requirements for management of construction waste and disposal, which forms the Contractor's commitment to reduce and divert waste materials from landfill and includes the following:
 - 1.1. Preparation of a Construction Waste Management Plan that provides guidance on a logical progression of tasks and procedures to be followed in a pollution prevention program to reduce or eliminate the generation of waste, the loss of natural resources, and process emissions through source reduction, reuse, recycling, and reclamation.
 - 1.2. Preparation of monthly progress reports indicating cumulative totals representing progress towards achieving diversion and reduction goals of waste materials away from landfill and identifying any special programs, landfill options or alternatives to landfill used during construction.
 - 1.3. Preparation of a Construction Waste Management Report containing detailed information indicating total waste produced by the Project, types of waste material and quantity of each material, and total waste diverted and diversion rates indicated as a percentage of the total waste produced.
2. Owner has established that this Project shall generate the least amount of waste possible and that processes that ensure the generation of as little waste as possible due to error, poor planning, breakage, mishandling, contamination, or other factors be employed by the Contractor.

1.2 Definitions

1. Clean Waste: Untreated and unpainted; not contaminated with oils, solvents, sealants or similar materials.
2. Construction and Demolition Waste: Solid wastes typically including 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 properties such as ignitability, corrosiveness, toxicity, or reactivity.
4. Non-hazardous: Exhibiting none of the characteristics of hazardous substances, including properties such as ignitability, corrosiveness, toxicity, or reactivity.
5. Non-toxic: Not poisonous to humans either immediately or 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:
 - 16.1. Solvents in paints and other coatings;
 - 16.2. Wood preservatives; strippers and household cleaners;
 - 16.3. Adhesives in particleboard, fiberboard, and some plywood; and foam insulation.
 - 16.4. When released, VOC's can contribute to the formation of smog and can cause respiratory tract problems, headaches, eye irritations, nausea, damage to the liver, kidneys, and central nervous system, and possibly cancer.
17. **Waste:** Extra material or material that has reached the end of its useful life in its intended use. Waste includes salvageable, returnable, recyclable, and reusable material.
18. **Construction 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.

1.3 Reference standards

1. ASTM International (ASTM)
2. Recycling Certification Institute (RCI)
 - 2.1. RCI Certification Construction and Demolition Materials Recycling

1.4 Administrative requirements

1. **Coordination:** Coordinate waste management requirements with all Divisions of the Work for the Project, and ensure that requirements of the Construction Waste Management Plan are followed.

1.5 Action and informational submittals

1. Submit required information in accordance with Section 01 33 00 - Submittal Procedures.
2. **Action Submittals:** Provide the following submittals before starting any work of this Section:
 - 2.1. **Construction Waste Management Plan (CWM Plan):** Submit a CWM Plan for this Project before any waste removal from site and that includes the following information:
 - 2.1.1. **Recycling Haulers and Markets:** Investigate local haulers and markets for recyclable materials, and incorporate into CWM Plan.
 - 2.1.2. **Alternative Waste Disposal:** Prepare a listing of each material proposed to be salvaged, reused, recycled or composted during the course of the Project, and the proposed local market for each material.
 - 2.1.3. **Landfill Materials:** Identify materials that cannot be recycled, reused or composted and provide explanation or justification; energy will be considered as a viable alternative diversion strategy for these materials where facilities exist and are operated in accordance with LEED Construction and Demolition Waste Management requirements.

- 2.1.4. Landfill Options: The name of the landfill where trash will be disposed of; landfill materials will form a part of the total waste generated by the Project.
- 2.1.5. Materials Handling Procedures: A description of the means by which any recycled waste materials will be protected from contamination, and a description of the means to be employed in recycling the above materials consistent with requirements for acceptance by designated facilities.
- 2.1.6. Transportation: A description of the means of transportation of the recyclable materials, whether materials will be site separated and self hauled to designated centers, or whether mixed materials will be collected by a waste hauler and removed from the site, and destination of materials.

1.6 Project closeout submittals

- 1. Diversion Documentation: Submit as constructed information in accordance with Section 01 78 00 - Closeout Submittals as follows:
 - 1.1. Construction Waste Management Report (CWM Report): Submit a CWM Report for this Project in a format acceptable to LEED submittal requirements and that includes the following information:
 - 1.1.1. Accounting: Submit information indicating total waste produced by the Project.
 - 1.1.2. Composition: Submit information indicating types of waste material and quantity of each material.
 - 1.1.3. Diversion Rate: Submit information indicating total waste diverted from landfill as a percentage of the total waste produced by the Project.
 - 1.1.4. Transportation Documentation: Submit copies of transportation documents or shipping manifests indicating weights of materials, and other evidence of disposal indicating final location of waste diverted from landfill and waste sent to landfill.
 - 1.1.5. Alternative Daily Cover (ADC): Submit quantities of material that were used as ADC at landfill sites, and that form a part of the total waste generated by the Project.
 - 1.1.6. Multiple Waste Hauling: Compile all information into a single CWM Report where multiple waste hauling and diversion strategies were used for the project.

1.7 Quality assurance

- 1. Resources for Development of Construction Waste Management Report (CWM Report): The following sources may be useful in developing the Draft Construction Waste Management Plan:
 - 1.1. Recycling Haulers and Markets: Investigate local haulers and markets for recyclable materials, and incorporate into CWM Plan.
 - 1.2. Waste-to-Energy Systems: Investigate local waste-to-energy incentives where systems for diverting materials from landfill for reuse or recycling are not available.
- 2. Certifications: Provide proof of the following during the course of the Work:
 - 2.1. Compliance Certification: Provide proof that recycling center is third party verified and is listed as a Certified Facility through the registration and certification requirements of the Recycling Certification Institute.

1.8 Delivery, storage, and handling

- 1. Storage Requirements: Implement a recycling/reuse program that includes separate collection of waste materials as appropriate to the Project waste and the available recycling and reuse programs in the Project area.
- 2. Handling Requirements: Clean materials that are contaminated before placing in collection containers and ensure that waste destined for landfill does not get mixed in with recycled materials:

- 2.1. Deliver materials free of dirt, adhesives, solvents, petroleum contamination, and other substances deleterious to recycling process.
- 2.2. Arrange for collection by or delivery to the appropriate recycling or reuse facility.
3. Hazardous Waste and Hazardous Materials: Handle in accordance with applicable regulations.

Part 2 Products

2.1 Not used

1. Not Used.

Part 3 Execution

3.1 (cwm plan) implementation

1. Manager: Contractor is responsible for designating an on site party or parties responsible for instructing workers and overseeing and documenting results of the CWM Plan for the Project.
2. Distribution: Distribute copies of the CWM Plan to the job site foreman, each Subcontractor, the Owner, the Consultant and other site personnel as required to maintain CWM Plan.
3. Instruction: Provide on-site instruction of appropriate separation, handling, and recycling, salvage, reuse, composting and return methods being used for the Project to Subcontractor 's at appropriate stages of the Project.
4. Separation Facilities: Lay out and label a specific area to facilitate separation of materials for potential recycling, salvage, reuse, composting and return:
 - 4.1. Recycling and waste bin areas are to be kept neat and clean and clearly marked in order to avoid contamination of materials.
 - 4.2. Hazardous wastes shall be separated, stored, and disposed of in accordance with local regulations.
5. Progressive Documentation: Submit a monthly summary of waste generated by the Project to ensure that waste diversion goals are on track with Project requirements:
 - 5.1. Submittal of waste summary can coincide with application for progress payment, or similar milestone event as agreed upon between the Owner, Contractor and Consultant.
 - 5.2. Monthly waste summary shall contain the following information:
 - 5.2.1. The amount in tonnes or m³ and location of material landfilled,
 - 5.2.2. The amount in tonnes or m³ and location of materials diverted from landfill, and
 - 5.2.3. Indication of progress based on total waste generated by the Project with materials diverted from landfill as a percentage.

3.2 Subcontractor's responsibility

1. Subcontractor 's shall cooperate fully with the Contractor to implement the CWM Plan.

3.3 Sample construction waste management forms

1. Sample waste tracking form below can be used by the Contractor to establish their own forms for recording management of construction waste:
 - 1.1.

Material Stream	Diverted Waste by Report Date	Total	Units				
Sept	Oct	Nov	Dec				

Material Streams Contributing to Credit	Plastic	1.25	2.5	10	5	18.75	m ³
Carpet	2.5	2.5	2.5	0	7.5	m ³	
Paper/Cardboard	5	2.5	2.5	5	15	m ³	
Clean Wood	0	25	0	1.25	26.25	m ³	
Metal	1.25	2.5	5.5	7	16.25	m ³	
Gypsum Board	2.5	2.5	4	5	14	m ³	
Brick/Concrete	10.5	2.5	5.5	8.75	27.25	m ³	
Asphalt Shingles	10	0	0	0	10	m ³	
Total Diverted Waste	135	m ³					

1.2.

Material Streams not Contributing to Credit	Landfill	10.75	7.5	15	10	43.25	m ³
Screen Fines (ADC)	5	1.25	0	2.5	8.75	m ³	
150 mm Minus (ADC)	1.25	1.25	5	5.5	13	m ³	
Total Landfill/ADC Waste	65	m ³					
Total Waste	200	m ³					
Percent Diverted	67.5	%					

End of Section

Section 01 77 00

Closeout Procedures

Part 1 General

1.1 Related requirements

1. Section 01 78 00 - Closeout Submittals.

1.2 Reference standards

1. Canadian Construction Documents Committee (CCDC)
 - 1.1. CCDC 2- 2020, Stipulated Price Contract.

1.3 Administrative requirements

1. Acceptance of Work Procedures:
 - 1.1. Contractor's Inspection: Contractor: conduct inspection of Work, identify deficiencies and defects, and repair as required to conform to Contract Documents.
 - 1.1.1. Notify Consultant in writing of satisfactory completion of Contractor's inspection and submit verification that corrections have been made.
 - 1.1.2. Request Consultant's inspection.
 - 1.2. Consultant's Inspection:
 - 1.2.1. Consultant and Contractor to inspect Work and identify defects and deficiencies.
 - 1.2.2. Contractor to correct Work as directed.
 - 1.3. Completion Tasks: submit written certificates in English that tasks have been performed as follows:
 - 1.3.1. Work: completed and inspected for compliance with Contract Documents.
 - 1.3.2. Defects: corrected and deficiencies completed.
 - 1.3.3. Equipment and systems: tested, adjusted and balanced and fully operational.
 - 1.3.4. Operation of systems: demonstrated to Owner's personnel.
 - 1.3.5. Commissioning of mechanical systems: completed in accordance with 01 91 13 - General Commissioning Requirements and 2 and copies of final Commissioning Report submitted to Owner.
 - 1.3.6. Work: complete and ready for final inspection.
 - 1.4. Final Inspection:
 - 1.4.1. When completion tasks are done, request final inspection of Work by Consultant, and Contractor.
 - 1.4.2. When Work incomplete according to Owner and Consultant, complete outstanding items and request re-inspection.
 - 1.5. Declaration of Substantial Performance: when Consultant considers deficiencies and defects corrected and requirements of Contract substantially performed, make application for Certificate of Substantial Performance.
 - 1.6. Commencement of Lien and Warranty Periods: date of Owner's acceptance of submitted declaration of Substantial Performance to be date for commencement for warranty period and commencement of lien period unless required otherwise by lien statute of Place of Work.

1.7. Final Payment:

1.7.1. When Consultant considers final deficiencies and defects corrected and requirements of Contract met, make application for final payment.

1.7.2. Refer to CCDC 2: when Work deemed incomplete by Consultant, complete outstanding items and request re-inspection.

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

1.4 Final cleaning

1. Clean in accordance with Section 01 74 00 - Cleaning.

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

2. Waste Management: separate waste materials for reuse and recycling in accordance with Section 01 74 19 - Waste Management and Disposal.

Part 2 Products

2.1 Not used

1. Not Used.

Part 3 Execution

3.1 Not used

1. Not Used.

End of Section

Section 01 78 00

Closeout Submittals

Part 1 General

1.1 Related requirements

1. Section 01 33 00 Submittal Procedures

1.2 Administrative requirements

1. Pre-warranty Meeting:
 - 1.1. Convene meeting one week before Contract completion with contractor's representative and Consultant, in accordance with 01 31 19 - Project Meetings to:
 - 1.1.1. Verify Project requirements.
 - 1.1.2. Review installation instructions and warranty requirements.
 - 1.2. Consultant to establish communication procedures for:
 - 1.2.1. Notifying construction warranty defects.
 - 1.2.2. Determine priorities for type of defects.
 - 1.2.3. Determine reasonable response time.
 - 1.3. Contact information for bonded and licensed company for warranty work action: provide name, telephone number and address of company authorized for construction warranty work action.
 - 1.4. Ensure contact is located within local service area of warranted construction, is continuously available, and is responsive to inquiries for warranty work action.

1.3 Action and informational submittals

1. Provide submittals in accordance with Section 01 33 00 - Submittal Procedures.
2. Two weeks before Substantial Performance of the Work, submit to the Consultant, one final hard copy and one PDF sent via email, of operating and maintenance manuals in English.
3. Provide spare parts, maintenance materials and special tools of same quality and manufacture as products provided in Work.
4. Provide evidence, if requested, for type, source and quality of products supplied.

1.4 Format

1. Organize data as instructional manual.
2. Binders: Vinyl, hard covered, 3 'D' ring, loose leaf 219 x 279 mm with spine and face pockets.
3. When multiple binders are used correlate data into related consistent groupings.
 - 3.1. Identify contents of each binder on spine.
4. Cover: Identify each binder with type or printed title 'Project Record Documents'; list title of project and identify subject matter of contents.
5. Arrange content by systems, under Section numbers and sequence of Table of Contents.
6. Provide tabbed fly leaf for each separate product and system, with typed description of product and major component parts of equipment.
7. Text: manufacturer's printed data, or typewritten data.

8. Drawings: Provide with reinforced punched binder tab.
 - 8.1. Bind in with text; fold larger drawings to size of text pages.
9. Provide 1:1 scaled CAD files in dwg format on CD.

1.5 Contents - project record documents

1. Title Page: provide project name, building name and address, completion date, general contractor name, address & phone numbers, Owner and Consultant's name, address & phone numbers.
2. Table of Contents for each binder: provide project name, building name and address, project number (GOC#), and project completion date.
3. Provide the following sections, divided by titled tabs, and spread over multiple binders if necessary:
 - 3.1.

1. Table of Contents: a fully detailed index of the O&M Manual. Title/ Page number, etc.

Tab A – Contact Information.

1. Include contact information for Consultant, General Contractor and all Sub-Contractors.
 2. Contractor Information: name, address, telephone number of manufacturer, installing contractor.
 3. 24-hour number for emergency service for all equipment, identified by equipment.

Tab B – Signed Letter of Warranty and Substantial Completion Letter.

1. Signed and dated letter of Warranty to include: project name, project number (GOC#), location, warranty start date (to be the date of Substantial Completion as declared by Consultant), and all manufacturer and extended warranties.

Tab C – Shop Drawings

1. A copy of all Shop Drawings reviewed by the Consultant and/or Third-Party Commissioning Agent, including associated product specifications. Include shop drawings log.

Tab D – System Operation

1. Expand on the way in which each of the systems operates.
 2. Copies of cx forms, interfaces/interlocks
 3. Running
 4. Copies of all TAB reports

Tab E – Manufacturers Literature/Information.

1. Include all the manufacturer's information (IOM) relating to the equipment, ancillaries, and systems.

Tab F – As-Built Drawings.

1. Marked in red ink by the Contractor and reviewed by the Consultant.

Tab G – Building Item (Equipment) Data Collection Forms (CMMS).

1. A copy of all completed CMMS Data Sheets for all equipment which was deleted, removed, added or replaced.

Tab H – Consultant Site Inspection Reports.

1. A copy of all Site Inspection Reports completed during the construction phase.

Tab I – Training Records.

1. A copy of all training schedules, attendance records. Indicate if training sessions were recorded.

Tab J – Coordination & Arc Flash Study.

1. The approved Coordination & Arc Flash Study for the electrical systems, including a soft copy of arc flash labels for each equipment and software files used for the study.

Tab K – Disposal of Equipment.

1. Submit copies of transportation documents or shipping manifests indicating weights of materials, and other evidence of disposal indicating final location of waste diverted from landfill and waste sent to landfill.

Tab L – Handover Spare Parts.

1. Provide inventory spare parts and maintenance materials in quantities specified in individual spec sections and special tools of same quality and manufacture as products provided in Work.
2. Provide a list of spares that are recommended to be held by the operator/facilities department.

1.6 As-built documents and samples

1. Maintain, in addition to requirements in General Conditions, one record copy of:
 - 1.1. Contract Drawings.
 - 1.2. Specifications.
 - 1.3. Addenda.
 - 1.4. Change Orders and other modifications to Contract.
 - 1.5. Reviewed shop drawings, product data, and samples.
 - 1.6. Site test records.
 - 1.7. Inspection certificates.
 - 1.8. Manufacturer's certificates.
2. Store record documents and samples in site office apart from documents used for construction.
 - 2.1. Provide files, racks, and secure storage.
3. Label record documents and file in accordance with Section number listings in List of Contents of this Project Manual.
 - 3.1. Label each document "PROJECT RECORD" in neat, large, printed letters.
4. Maintain record documents in clean, dry and legible condition.
 - 4.1. Do not use record documents for construction purposes.
5. Keep record documents and samples available for inspection by Consultant.

1.7 Recording information on project record documents

1. Record information on set of red line opaque drawings, and in copy of Project Manual, provided by Consultant.

2. Use felt tip marking pens, maintaining separate colours for each major system, for recording information.
3. Record information concurrently with construction progress.
 - 3.1. Do not conceal Work until required information is recorded.
4. Contract Drawings and shop drawings: mark each item to record actual construction, including:
 - 4.1. Measured depths of elements of foundation in relation to finish first floor datum.
 - 4.2. Measured horizontal and vertical locations of underground utilities and appurtenances, referenced to permanent surface improvements.
 - 4.3. Measured locations of internal utilities and appurtenances, referenced to visible and accessible features of construction.
 - 4.4. Site changes of dimension and detail.
 - 4.5. Changes made by change orders.
 - 4.6. Details not on original Contract Drawings.
 - 4.7. Referenced Standards to related shop drawings and modifications.
5. Specifications: mark each item to record actual construction, including:
 - 5.1. Manufacturer, trade name, and catalogue number of each product actually installed, particularly optional items and substitute items.
 - 5.2. Changes made by Addenda and change orders.
6. Provide three complete sets of shop drawings bearing all markings and approvals in good condition. Enclose 11" x 17" or smaller in three hole punched envelopes, organized by specification section, inserted in a three ring "D" type binder (s) suitably titled to indicate contents.
7. Operating and Maintenance Manuals:
 - 7.1. Submit in accordance with Section 01 91 15 – Operations & Maintenance Manual.
8. Other Documents: Maintain manufacturer's certifications, inspection certifications, site test records, required by individual specifications Sections.
9. Provide digital photos, if requested, for site records.
10. A holdback from the moneys due to the Contractor will be maintained until all the "record drawings" are certified as correct and delivered to the Architect.

1.8 Final survey

1. Submit final site survey certificate in accordance with Section 01 71 00 - Examination and Preparation, certifying that elevations and locations of completed Work are in conformance, or non-conformance with Contract Documents.
2. Before requesting inspection for certification of final acceptance and final payment, complete the following:
 - 2.1. Submit a copy of the deficiency list generated at the inspection for Substantial Completion, stating that each item has been completed or otherwise resolved for acceptance.
 - 2.2. Submit final payment request with releases.
 - 2.3. Submit a final statement, accounting for changes to the Contract Sum.
 - 2.4. Submit final meter readings for utilities, and similar data as of Substantial Completion.
 - 2.5. Submit consent of surety to final payment.
 - 2.6. Submit evidence of continuing insurance coverage complying with insurance requirements.

1.9 Final Payment

1. Provide three complete sets of shop drawings bearing all markings and approvals in good condition. Enclose 11" x 17" or smaller in three hole punched envelopes, organized by specification section, inserted in a three ring "D" type binder (s) suitably titled to indicate contents.
 - 1.1. Proof of release and discharge of any builders' or other liens.
 - 1.2. If specifically requested by the Owner, satisfactory evidence that all taxes, employment insurance premiums, Canada Pension Plan contributions, duties, royalties, and all other monies required by law to be paid by the Contractor and all Sub-contractors have been paid in full.
 - 1.3. A statutory declaration in accordance with the Contract requirements.
2. The Contractor shall be responsible for all additional costs incurred by the Owner for review and inspection of the Work where previously identified deficient and incomplete work has not been rectified or completed in a manner satisfactory to the Owner, making additional inspections by Consultant necessary, or where the Contractor has failed to satisfy all requirements set out in the Contract requirements and before the date agreed upon in the Contract requirements, and such costs shall be deducted from the money due to the Contractor upon issuance of the final certificate for payment.

1.10 Equipment and systems

1. For each item of equipment and each system include description of unit or system, and component parts.
 - 1.1. Give function, normal operation characteristics and limiting conditions.
 - 1.2. 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.
 - 4.1. Include regulation, control, stopping, shut-down, and emergency instructions.
 - 4.2. 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 in Section 01 45 00 - Quality Control and Section 01 91 13 - General Commissioning Requirements.

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

1.11 Materials and finishes

1. Building products, applied materials, and finishes: Include product data, with catalogue number, size, composition, and colour and texture designations.
 - 1.1. Provide information for re-ordering custom manufactured products.
2. Instructions for cleaning agents and methods, precautions against detrimental agents and methods, and recommended schedule for cleaning and maintenance.
3. Moisture-protection and weather-exposed products: Include manufacturer's recommendations for cleaning agents and methods, precautions against detrimental agents and methods, and recommended schedule for cleaning and maintenance.
4. Additional requirements: As specified in individual specifications Sections.

1.12 Maintenance materials

1. Spare Parts:
 - 1.1. Provide spare parts, in quantities specified in individual specification Sections.
 - 1.2. Provide items of same manufacture and quality as items in Work.
 - 1.3. Deliver to site; place and store.
 - 1.4. Receive and catalogue items.
 - 1.4.1. Submit inventory listing to Consultant and Client.
 - 1.4.2. Include approved listings in Maintenance Manual.
 - 1.5. Obtain receipt for delivered products and submit before final payment.
2. Extra Stock Materials:
 - 2.1. Provide maintenance and extra materials, in quantities specified in individual specification Sections.
 - 2.2. Provide items of same manufacture and quality as items in Work.
 - 2.3. Deliver to site; place and store.
 - 2.4. Receive and catalogue items.
 - 2.4.1. Submit inventory listing to Consultant.
 - 2.4.2. Include approved listings in Maintenance Manual.
 - 2.5. Obtain receipt for delivered products and submit before to final payment.
3. Special Tools:
 - 3.1. Provide special tools, in quantities specified in individual specification Section.
 - 3.2. Provide items with tags identifying their associated function and equipment.
 - 3.3. Deliver to site; place and store.
 - 3.4. Receive and catalogue items.
 - 3.4.1. Submit inventory listing to Consultant.
 - 3.4.2. Include approved listings in Maintenance Manual.

1.13 Delivery, storage, and handling

1. Store spare parts, maintenance materials, and special tools in manner to prevent damage or deterioration.
2. Store in original and undamaged condition with manufacturer's seal and labels intact.

3. Store components subject to damage from weather in weatherproof enclosures.
4. Store paints and freezable materials in a heated and ventilated room.
5. Remove and replace damaged products at own expense and for review by Consultant.

1.14 Warranties and bonds

1. Develop warranty management plan to contain information relevant to Warranties.
2. Submit warranty management plan, 30 days before planned pre-warranty conference, to Consultant approval.
3. Warranty management plan to include required actions and documents to assure that Departmental Representative receives warranties to which it is entitled.
4. Provide plan in narrative form and contain sufficient detail to make it suitable for use by future maintenance and repair personnel.
5. Submit, warranty information made available during construction phase, to Departmental Representative for approval before each monthly pay estimate.
6. Assemble approved information in binder, submit upon acceptance of work and organize binder as follows:
 - 6.1. Separate each warranty or bond with index tab sheets keyed to Table of Contents listing.
 - 6.2. List Subcontractor, supplier, and manufacturer, with name, address, and telephone number of responsible principal.
 - 6.3. Obtain warranties and bonds, executed in duplicate by Subcontractors, suppliers, and manufacturers, within ten days after completion of applicable item of work.
 - 6.4. Verify that documents are in proper form, contain full information, and are notarized.
 - 6.5. Co-execute submittals when required.
 - 6.6. Retain warranties and bonds until time specified for submittal.
7. Except for items put into use with Owner's permission, leave date of beginning of time of warranty until Date of Substantial Performance is determined.
8. Conduct joint 4 month and 9 month warranty inspection, measured from time of acceptance, by Consultant.
9. Include information contained in warranty management plan as follows:
 - 9.1. Roles and responsibilities of personnel associated with warranty process, including points of contact and telephone numbers within the organizations of Contractors, Subcontractors, manufacturers, or suppliers involved.
 - 9.2. Provide list for each warranted equipment, item, feature of construction or system indicating:
 - 9.2.1. Name of item.
 - 9.2.2. Model and serial numbers.
 - 9.2.3. Location where installed.
 - 9.2.4. Name and phone numbers of manufacturers or suppliers.
 - 9.2.5. Names, addresses and telephone numbers of sources of spare parts.
 - 9.2.6. Warranties and terms of warranty: include one-year overall warranty of construction. Indicate items that have extended warranties and show separate warranty expiration dates.
 - 9.2.7. Cross-reference to warranty certificates as applicable.
 - 9.2.8. Starting point and duration of warranty period.
 - 9.2.9. Summary of maintenance procedures required to continue warranty in force.

- 9.2.10. Cross-Reference to specific pertinent Operation and Maintenance manuals.
- 9.2.11. Organization, names and phone numbers of persons to call for warranty service.
- 9.2.12. Typical response time and repair time expected for various warranted equipment.
- 9.3. Contractor's plans for attendance at 4 and 9 month post-construction warranty inspections.
- 9.4. Procedure and status of tagging of equipment covered by extended warranties.
- 9.5. Post copies of instructions near selected pieces of equipment where operation is critical for warranty and/or safety reasons.
- 10. Respond in timely manner to oral or written notification of required construction warranty repair work.
- 11. Written verification to follow oral instructions.
 - 11.1. Failure to respond will be cause for the Departmental Representative to proceed with action against Contractor.

1.15 Warranty tags

- 1. Tag, at time of installation, each warranted item. Provide durable, oil- and water-resistant tag approved by Departmental Representative.
- 2. Attach tags with copper wire and spray with waterproof silicone coating.
- 3. Leave date of acceptance until project is accepted for occupancy.
- 4. Indicate the following information on tag:
 - 4.1. Type of product/material.
 - 4.2. Model number.
 - 4.3. Serial number.
 - 4.4. Contract number.
 - 4.5. Warranty period.
 - 4.6. Inspector's signature.
 - 4.7. Construction Contractor.

Part 2 Products

2.1 Not used

- 1. Not Used.

Part 3 Execution

3.1 Not used

- 1. Not Used.

End of Section

Section 01 92 00

Facility Operation

Part 1 General

1.1 General requirements

1. Standard letter size paper 216 mm x 279 mm.
2. Methodology used to facilitate updating.
3. Drawings, diagrams and schematics to be professionally developed.
4. Electronic copy of data to be in a format accepted and approved by Consultant.
5. Prior to commencement, coordinate requirements for preparation, submission and approval with Consultant.
6. Manual is required to be submitted for review prior to substantial completion date.
7. Manual should follow the outlines provided by BGIS commissioning team.

1.2 Approvals

1. Prior to commencement, co-ordinate requirements for preparation, submission and approval with Consultant.

1.3 General information

1. Provide Consultant the following for insertion into appropriate Part and Section of BMM:
 - 1.1. Complete list of names, addresses, telephone and fax numbers of contractor, sub-contractors that participated in delivery of project - as indicated in Section 1.2 of BMM.
 - 1.2. Summary of architectural, structural, fire protection, mechanical and electrical systems installed and commissioned - as indicated in Section 1.4 of BMM.
 - 1.2.1. Including sequence of operation as finalized after commissioning is complete as indicated in Section 2.0 of BMM.
 - 1.3. Description of building operation under conditions of heightened security and emergencies as indicated in Section 2.0 of BMM.
 - 1.4. System, equipment and components Maintenance Management System (MMS) identification - Section 2.1 of BMM.
 - 1.5. Information on operation and maintenance of architectural systems and equipment installed and commissioned - Section 2.0 of BMM.
 - 1.6. Information on operation and maintenance of fire protection and life safety systems and equipment installed and commissioned - Section 2.0 of BMM.
 - 1.7. Information on operation and maintenance of mechanical systems and equipment installed and commissioned - Section 2.0 of BMM.
 - 1.8. Operating and maintenance manual - Section 3.2 of BMM.
 - 1.9. Completed Product Information (PI) and Performance Verification (PV) report forms, approved and accepted by Consultant.

1.4 Contents of operating and maintenance manual

1. Title Page: provide project name, building name and address, completion date, general contractor name, address & phone numbers, Owner and Consultant's name, address & phone numbers.
2. Table of Contents for each binder: provide project name, building name and address, project number (GOC#), and project completion date.
3. Provide the following sections, divided by titled tabs, and spread over multiple binders if necessary:
 1. Table of Contents: a fully detailed index of the O&M Manual. Title/ Page number, etc.

Tab A – Contact Information.

1. Include contact information for Consultant, General Contractor and all Sub-Contractors.
2. Contractor Information: name, address, telephone number of manufacturer, installing contractor.
3. 24-hour number for emergency service for all equipment, identified by equipment.

Tab B – Signed Letter of Warranty and Substantial Completion Letter.

1. Signed and dated letter of Warranty to include: project name, project number (GOC#), location, warranty start date (to be the date of Substantial Completion as declared by Consultant), and all manufacturer and extended warranties.

Tab C – Shop Drawings

1. A copy of all Shop Drawings reviewed by the Consultant and/or Third-Party Commissioning Agent, including associated product specifications. Include shop drawings log.

Tab D – System Operation

1. Expand on the way in which each of the systems operates.
2. Copies of Cx Forms, interfaces/interlocks
3. Copies of all TAB reports

Tab E – Manufacturers Literature/Information.

1. Include all the manufacturer's information (IOM) relating to the equipment, ancillaries, and systems.

Tab F – As-Built Drawings.

1. Marked in red ink by the Contractor and reviewed by the Consultant.

Tab G – Building Item (Equipment) Data Collection Forms (CMMS).

1. A copy of all completed CMMS Data Sheets for all equipment which was deleted, removed, added or replaced.

Tab H – Consultant Site Inspection Reports.

1. A copy of all Site Inspection Reports completed during the construction phase.

Tab I – Training Records.

1. A copy of all training schedules, attendance records. Indicate if training sessions were recorded.

Tab J – Coordination & Arch Flash Study.

1. The approved Coordination & Arc Flash Study for the electrical systems, including a soft copy of arc flash labels for each equipment and software files used for the study.

Tab K – Disposal of Equipment.

1. Submit copies of transportation documents or shipping manifests indicating weights of materials, and other evidence of disposal indicating final location of waste diverted from landfill and waste sent to landfill.

Tab L – Handover Spare Parts.

1. Provide inventory spare parts and maintenance materials in quantities specified in individual spec sections and special tools of same quality and manufacture as products provided in Work.
2. Provide a list of spares that are recommended to be held by the operator/facilities department.
4. Product Data: mark each sheet to identify specific products and component parts, and data applicable to installation; delete inapplicable information.
5. Drawings: supplement product data to illustrate relations of component parts of equipment and systems, to show control and flow diagrams.
6. Typewritten Text: as required to supplement product data.
 1. Provide logical sequence of instructions for each procedure, incorporating manufacturer's instructions specified in Section 01 45 00 - Quality Control.

1.5 Life safety compliance (lsc) manual

1. Samples of LSC Manual will be available from Departmental Representative.
2. Content of Manual:
 - 2.1. All possible Emergency situations modes including: presence of fire and smoke, power failure, lose of water or pressure, chemical spills and refrigerant release.
 - 2.2. Failure of elevators and escalators.
 - 2.3. HVAC emergencies and fuel supply failures.
 - 2.4. Intrusion and security breach.
 - 2.5. Emergency provisions for natural disasters, bomb threats and other disruptive situations.
 - 2.6. Dedicated emergency generators for high security projects, medical facilities and computer systems.
 - 2.7. Emergency control procedures for fire, power and major equipment failure.
 - 2.8. Emergency contacts and numbers.
 - 2.9. Manual to be readily available and comprehensible to non- technical readers.

1.6 Supporting documentation for insertion into supporting appendices

1. Provide Consultant supporting documentation relating to installed equipment and system, including:
 - 1.1. General:
 - 1.1.1. WHMIS information manual.
 - 1.1.2. Approved "as-built" drawings and specifications.
 - 1.1.3. Procedures used during commissioning.
 - 1.1.4. Cross-Reference to specification sections.
 - 1.2. Architectural and structural:

- 1.2.1. Inspection certificates, construction permits.
 - 1.2.2. Roof anchor log books.
 - 1.2.3. PV reports.
 - 1.3. Fire prevention, suppression and protection:
 - 1.3.1. Test reports.
 - 1.3.2. Smoke test reports.
 - 1.3.3. PV reports.
 - 1.4. Mechanical:
 - 1.4.1. Installation permits, inspection certificates.
 - 1.4.2. Piping pressure test certificates.
 - 1.4.3. Ducting leakage test reports.
 - 1.4.4. TAB and PV reports.
 - 1.4.5. Charts of valves and steam traps.
 - 1.4.6. Copies of posted instructions.
 - 1.5. Electrical:
 - 1.5.1. Installation permits, inspection certificates.
 - 1.5.2. TAB and PV reports.
 - 1.5.3. Electrical work log book.
 - 1.5.4. Charts and schedules.
 - 1.5.5. Locations of cables and components.
 - 1.5.6. Copies of posted instructions.
 - 2. Assist Consultant with preparation of BMM.
- 1.7 Language**
- 1. English Language.
- 1.8 Use of current technology**
- 1. Use current technology for production of documentation. Emphasis on ease of accessibility at all times, maintain in up-to-date state, compatibility with user's requirements.
 - 2. Obtain Consultant's approval before starting Work.

Part 2 Products

2.1 Not used

- 1. Not used.

Part 3 Execution

3.1 Not used

- 1. Not used.

End of Section

Section 02 41 19.16

Selective Interior Demolition

Part 1 General

1.1 Summary

1. Section includes:
 - 1.1. demolition and removal of selected portions of interior building components and finishes; and
 - 1.2. repair procedures for selective demolition operations.
2. Section does not include:
 - 2.1. removal of hazardous materials or asbestos abatement;
 - 2.2. demolition of exterior building components or structural elements; and
 - 2.3. mechanical or electrical equipment, except as required to make minor modifications to allow the work to be completed.

1.2 Related requirements

1. Section 02 26 00 - Hazardous Material Assessment

1.3 Definitions

1. Demolish: Detach items from existing construction and legally dispose of them off site, unless indicated to be removed and salvaged or removed and reinstalled.
2. Hazardous material: Controlled product and a chemical, biological, or physical agent that, by reason of a property that the agent possesses, is hazardous to the safety or health of a person exposed to it. Synonymous with the definition of hazardous substance in the Canada Labour Code.
3. Waste management coordinator: In accordance with Section 01 74 19 - Waste Management and Disposal.

1.4 Reference standards

1. ASTM International (ASTM):
 - 1.1. ASTM A653/A653-18, Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process
 - 1.2. ASTM C475/C475M-17, Standard Specification for Joint Compound and Joint Tape for Finishing Gypsum Board
2. CSA Group (CSA):
 - 2.1. CSA S350-M1980, Code of Practice for Safety in Demolition of Structures
 - 2.2. CSA Z783:12, Deconstruction of buildings and their related parts
 - 2.3. CSA Z8000, Canadian Health Care Facilities – Planning, Design and Construction
3. Employment and Social Development Canada (ESDC):
 - 3.1. [Canada Labour Code \(R.S.C., 1985, c. L-2\)](#)

1.5 Administrative requirements

1. Pre-demolition meetings: Conduct a site meeting in accordance with Section 01 31 19 - Project Meetings and attended by the Consultant and appropriate Subcontractors to:

J. Robert Thibodeau Architecture + Design
Inc.
Client: NHA

Project No:
BC-1372

- 1.1. Verify project requirements, including existing construction conditions affected by work of this section, scope of selective interior demolition work, demolition sequencing, and protection of in-place conditions.
- 1.2. Review scheduling of utility disruptions that may affect building occupants.
- 1.3. Review the construction and demolition waste management plan (CDWMP) specified in Section 01 74 19 - Waste Management and Disposal.
2. Scheduling:
 - 2.1. Maintain project schedule without compromising specified minimum material diversion rates.
 - 2.2. Notify the Consultant of unforeseen delays, in writing.

1.6 Action and information submittals

1. Submit in accordance with Section 01 33 00 - Submittal Procedures.
2. Shop drawings:
 - 2.1. Signed and sealed by a qualified professional in accordance with Section 01 43 00 - Quality Assurance.
 - 2.2. Selective interior demolition drawings, diagrams, details, or procedure showing sequence of selective interior demolition.
 - 2.2.1. Show locations of temporary partitions and means of egress.
 - 2.2.2. Outline coordination of shutoff, capping, and continuation of utility services.
 - 2.2.3. Detail proposed dust control and noise-control measures, including locations, and durations.
3. Delegated design submittals:
 - 3.1. Signed and sealed by a qualified professional in accordance with Section 01 43 00 - Quality Assurance.
 - 3.2. Submit in formats acceptable to the Consultant and the authority having jurisdiction (AHJ):
 - 3.2.1. Letter of assurance of professional design and compliance, and commitment for field review indicating are designed to meet the intent of the building code.
 - 3.2.1.1. Submit with shop drawings.
 - 3.2.2. Letter of assurance of professional field review and compliance indicated comply with the design and reviewed shop drawings.
 - 3.2.2.1. Submit within 5 Working Days of site visit.
4. Site quality control submittals:
 - 4.1. Pre-demolition photographs or video recordings as specified in EXAMINATION in this section.
 - 4.2. Report indicating results of inspections specified in SITE QUALITY CONTROL in this section.
5. Special procedure submittals:
 - 5.1. Schedule of selective interior demolition activities: In accordance with Section 01 32 16.19 - Construction Progress Schedule - Bar (Gantt) Chart.
 - 5.1.1. Indicate, at minimum:
 - 5.1.1.1. detailed sequence of selective interior demolition and removal work
 - 5.1.1.2. utility service interruptions
 - 5.2. Inventory: Submit a list of items that have been removed and salvaged after selective interior demolition is complete.

5.3. Landfill records: Indicate receipt and acceptance of hazardous wastes by a landfill facility licensed to accept hazardous wastes.

6. Submit copies of the following, when required by the authority having jurisdiction (AHJ):

6.1. reviewed shop drawings; and

6.2. reviewed demolition procedures.

1.7 Site conditions

1. Hazardous materials are not expected at the work site.

1.1. Review the hazardous materials assessment in accordance with Section 02 26 00 - Hazardous Material Assessment.

1.2. The Owner will remove hazardous materials before start of the work.

2. Stop work immediately and take preventative measures if hazardous materials are encountered.

2.1. Notify the Consultant immediately.

2.2. Proceed with work after receipt of written instructions from the Consultant.

3. The Owner and Consultant assume no responsibility for condition of areas to be selectively demolished:

3.1. Conditions existing at time of bidders briefing will be maintained as far as practical.

3.2. The Owner will remove the following items prior to selective interior demolition:

3.2.1. Any mobile medical equipment, medical and operational supplies, and related IMIT equipment (desktop computers, towers, phones, etc) will be relocated out of construction zones prior to demolition. In-situ medical equipment (i.e. the CT machine) will be dismantled by the vendor of the new equipment (GE).

Part 2 Products - Not Used

Part 3 Execution

3.1 Examination

1. Verification of conditions:

1.1. Verify substrate and project conditions in accordance with Section 01 71 00 - Examination and Preparation, and:

1.1.1. Review existing conditions and coordinate with indicated requirements to determine extent of demolition required.

1.1.2. Inventory and record the condition of items being removed and turned over to the Owner. Promptly submit a written report to the Consultant.

1.1.3. Inventory and record the condition of items being removed and reinstalled.

1.1.4. When unexpected structural, mechanical, electrical, or other issues are encountered that interfere with demolition or removal, investigate and measure the nature and extent of the interference.

1.1.4.1. Promptly submit a written report to the Consultant.

1.1.5. Verify hazardous materials have been remediated before proceeding with work of this section.

1.1.6. Verify affected utilities have been disconnected and are ready to be [capped].

1.1.7. Review conditions as the work progresses to detect hazards resulting from work of this section.

3.2 Preparation

1. Protection of in-place conditions:
 - 1.1. Protect in-place conditions in accordance with Section 01 56 00 - Temporary Barriers and Enclosures, and:
 - 1.1.1. Cover and protect furniture, furnishings, and equipment that have to remain.
2. Demolition/removal:
 - 2.1. Drain, purge, or otherwise remove, collect, and dispose of chemicals, gases, explosives, acids, flammables, or other hazardous materials contained in pipes, tanks, or other similar items, before beginning selective demolition.

3.3 Pollution controls

1. Comply with the site-specific environmental protection plan (EPP) in accordance with Section 01 35 43 - Environmental Procedures.
2. Dust control: Provide water mist, temporary enclosures, or other suitable methods acceptable to the Departmental Representative to limit spread of dust and dirt.
 - 2.1. Do not use water when it may damage existing construction or create hazardous or objectionable conditions, such as ice, flooding, and pollution.
 - 2.2. Wet mop floors to eliminate tracking of dirt, wipe down walls and doors of demolition enclosure. Vacuum carpeted areas.
3. Remove and handle debris to prevent spillage on adjacent surfaces and areas.

3.4 Existing services

1. Comply with Section 01 11 00 - Summary of Work, and:
 - 1.1. Arrange to shut off affected utilities with utility companies.
 - 1.1.1. Disruption of active or energized utilities designated to remain undisturbed is not permitted.
 - 1.2. Disconnect and reroute electrical and service lines within the Place of the Work.
 - 1.2.1. Post warning signs on electrical lines and equipment that must remain energized.
 - 1.3. Disconnect and cap designated mechanical services.
 - 1.3.1. Natural gas supply lines: Remove in accordance with gas company requirements.
 - 1.3.2. Sewer and water lines: Remove in accordance with utility company requirements.
 - 1.4. Provide temporary utilities, bypassing selective demolition areas, to maintain continuity of service to other parts of building in accordance with Section 01 51 00 - Temporary Utilities.
 - 1.5. Pipes or conduits:
 - 1.5.1. Cut off pipe or conduit in walls or partitions to be removed. Cap, valve, or plug and seal remaining portions after bypassing.
 - 1.5.1.1. Piping: Disconnect at unions, flanges, valves, or fittings.
 - 1.5.1.2. Conduit: Disassemble into unit lengths and remove plug-in and disconnecting devices.
 - 1.5.2. Cut off pipe or conduit to minimum 25 mm below slab. Remove concrete mound.
 - 1.6. Begin selective demolition work after utility disconnections are completed and verified in writing.

3.5 Demolition

1. Demolish items as indicated on the Drawings.

- 1.1. Demolish selective building items in accordance with CSA Z783.
- 1.2. Demolish and dismantle work in a neat and orderly manner.
- 1.3. Leave work in safe and stable condition at end of each work day.
- 1.4. Demolish in a manner to minimize dust and to prevent migration of dust outside of work area.
- 1.5. Demolish designated carpet, resilient flooring, and adhesive remnants:
 - 1.5.1. Remove adhesive to the greatest extent possible:
 - 1.5.1.1. Do not use solvent-based cleaners to remove adhesive remnants.
 - 1.5.1.2. Lightly shot blast or grind floor using machine designed for purpose to remove adhesive remnants.
 - 1.5.1.3. Vacuum floor ready for application of skim coat.
 - 1.5.2. Repair slab depressions and damage with floor patching and levelling compound.
 - 1.5.3. Skim coat floor with minimum 1 mm thick floor patching and levelling compound compatible with new flooring materials.
 - 1.5.4. Finish floor substrates smooth, free from ridges and depressions, and adhesive remnants that could telegraph through resilient flooring materials and carpets.

3.6 Restoration

1. Floors and walls:
 - 1.1. Patch and repair floor and wall surfaces that extend from one finished area into another.
 - 1.2. Provide level, smooth surfaces with uniform finish colours, textures, and appearances.
 - 1.3. Replace floor and wall coverings with new materials, if necessary, to achieve uniform colour and appearance.
 - 1.4. Patch with durable seams that are as invisible as possible.
 - 1.5. Provide materials and comply with installation requirements specified in other technical sections.
 - 1.6. Painted surface patching: Apply primer and intermediate paint coats over patch and apply final paint coat over entire unbroken surface containing patch. Provide additional coats until patch blends with adjacent surfaces.
 - 1.7. Where feasible, test and inspect patched areas after completion to demonstrate integrity of installation.
 - 1.8. Gypsum board walls:
 - 1.8.1. Fill openings with gypsum board and framing to match existing, skim coat to make wall smooth and even.
 - 1.8.2. Patch and repair wall surfaces with skim coat of gypsum board patching compound. Finish wall surfaces smooth and even, ready for new wall finishes.
2. Ceilings: Patch, repair, or re-hang existing ceilings as necessary to provide an even plane surface of uniform appearance.
3. Patch and repair radiator cabinets, mechanical equipment, and electrical fixtures damaged or exposed during demolition to match adjacent finished surfaces.
4. Adjust junction boxes, receptacles, and switch boxes flush with new wall construction where additional layers to existing construction are indicated.
5. Remove permanent marker lines on exposed surfaces and at surfaces indicated for subsequent finish materials. Sealing or priming over permanent marker lines is not acceptable.

3.7 Cleaning

1. Clean in accordance with Section 01 74 00 - Cleaning, and:
 - 1.1. Clean adjacent areas and work of dust, dirt, and debris caused by selective demolition operations. Return adjacent areas to condition existing before selective demolition operations began.
2. Waste management:
 - 2.1. Manage waste in accordance with Section 01 74 19 - Waste Management and Disposal, and:
 - 2.1.1. Take possession of demolished materials and remove from site.
 - 2.1.1.1. Storage and sale of removed items on site is not permitted.
 - 2.1.2. Remove stockpiled material designated for removal when it interferes with the work.
 - 2.1.3. Remove stockpiles of like materials designated for removal and alternate disposal option once material collection is complete.
 - 2.1.4. Disposal of waste volatile materials, including mineral spirits, oil, petroleum-based lubricants, or toxic cleaning solutions into watercourses, or storm- or sanitary sewers, is not permitted.
 - 2.1.5. Remove decayed, vermin infested, or otherwise dangerous or unsuitable materials and promptly dispose of waste off site.

End of Section

Section 02 81 00

Transportation and Disposal of Hazardous Materials

Part 1 General

1.1 Related requirements

1. Section 07 92 00 - Joint Sealants
2. Section 09 91 00 08 - Painting for Minor Work

1.2 Definitions

1. Dangerous Goods: product, substance, or organism specifically listed or meets hazard criteria established in Transportation of Dangerous Goods Regulations.
2. Hazardous Material: product, substance, or organism used for its original purpose; and is either dangerous goods or material that will cause adverse impact to environment or adversely affect health of persons, animals, or plant life when released into environment.
3. Hazardous Waste: hazardous material no longer used for its original purpose and that is intended for recycling, treatment or disposal.

1.3 Reference standards

1. Canada Green Building Council (CaGBC)
 - 1.1. LEED Canada-NC Version 1.0-2004, LEED (Leadership in Energy and Environmental Design): Green Building Rating System Reference Package For New Construction and Major Renovations (including Addendum 2007).
 - 1.2. LEED Canada-CI Version 1.0-2007, LEED (Leadership in Energy and Environmental Design): Green Building Rating System Reference Guide For Commercial Interiors.
2. Canadian Environmental Protection Act, 1999 (CEPA 1999)
 - 2.1. Export and Import of Hazardous Waste and Hazardous Recyclable Material Regulations (SOR/2005-149).
3. Department of Justice Canada (Jus)
 - 3.1. Transportation of Dangerous Goods Act, 1992 (TDG Act) 1992, (c. 34).
 - 3.2. Transportation of Dangerous Goods Regulations (T-19.01-SOR/2001-286).
4. Green Seal Environmental Standards (GS)
 - 4.1. GS-11-2008, 2nd Edition, Paints and Coatings.
 - 4.2. GS-36-00, Commercial Adhesives.
5. Health Canada / Workplace Hazardous Materials Information System (WHMIS)
 - 5.1. WHMIS Safety Data Sheets (SDS).
6. National Research Council Canada (NRC)
 - 6.1. National Fire Code of Canada 2015 (NFC).
7. South Coast Air Quality Management District (SCAQMD), California State, Regulation XI. Source Specific Standards
 - 7.1. SCAQMD Rule 1113-A2007, Architectural Coatings.
 - 7.2. SCAQMD Rule 1168-A2005, Adhesive and Sealant Applications.

1.4 Action and informational submittals

1. Submit in accordance with Section 01 33 00 - Submittal Procedures.
2. If any modifications to areas that were not tested, the Contractor is to ensure further testing occurs prior to disturbance.
3. Product Data:
 - 3.1. Submit manufacturer's instructions, printed product literature and data sheets for hazardous materials and include product characteristics, performance criteria, physical size, finish and limitations.
 - 3.2. Submit two copies of WHMIS Safety Data Sheets (SDS) in accordance with Section 01 35 29.06 - Health and Safety Requirements to Consultant for each hazardous material required prior to bringing hazardous material on site.
 - 3.3. Submit hazardous materials management plan to Consultant that identifies hazardous materials, usage, location, personal protective equipment requirements, and disposal arrangements.
 - 3.4. Hazardous waste classification: identify waste codes applicable to each hazardous waste material based on applicable federal and provincial acts, regulations, and guidelines. Waste profiles, analyses, and classification submitted to contract offices for review and approval.
4. Sustainable Design Submittals:
 - 4.1. Construction Waste Management:
 - 4.2. Low-Emitting Materials: submit listing of paints and coatings used in building, comply with VOC and chemical component limits or restrictions requirements.
 - 4.3. Record keeping: contractor is responsible for maintaining adequate records of handling, storing, and shipping of hazardous materials.

1.5 Delivery, storage and handling

1. Deliver, store and handle materials in accordance with Section and with manufacturer's written instructions.
2. Delivery and Acceptance Requirements: deliver materials to site in original factory packaging, labelled with manufacturer's name and address.
3. Transport hazardous materials and wastes in accordance with Transportation of Dangerous Goods Act, Transportation of Dangerous Goods Regulations, and applicable provincial regulations.
 - 3.1. When exporting hazardous waste to another country, ensure compliance with Export and Import of Hazardous Waste and Hazardous Recyclable Materials Regulations.
4. Storage and Handling Requirements:
 - 4.1. Co-ordinate storage of hazardous materials with BGIS Representative and abide by internal requirements for labelling and storage of materials and wastes.
 - 4.2. Store and handle hazardous materials and wastes in accordance with applicable federal and provincial laws, regulations, codes, and guidelines.
 - 4.3. Observe smoking regulations, smoking is prohibited in areas where hazardous materials are stored, used, or handled.
 - 4.4. Storage requirements for quantities of hazardous materials and wastes in excess of 5 kg for solids, and 5 litres for liquids:
 - 4.4.1. Store hazardous materials and wastes in closed and sealed containers.
 - 4.4.2. Label containers of hazardous materials and wastes in accordance with WHMIS.
 - 4.4.3. Store hazardous materials and wastes in containers compatible with that material or waste.

- 4.4.4. Segregate incompatible materials and wastes.
- 4.4.5. Ensure that different hazardous materials or hazardous wastes are stored in separate containers.
- 4.4.6. Store hazardous materials and wastes in secure storage area with controlled access.
- 4.4.7. Maintain clear egress from storage area.
- 4.4.8. Store hazardous materials and wastes in location that will prevent them from spilling into environment.
- 4.4.9. Have appropriate emergency spill response equipment available near storage area, including personal protective equipment.
- 4.4.10. Maintain inventory of hazardous materials and wastes, including product name, quantity, and date when storage began.
- 4.4.11. When hazardous waste is generated on site:
 - 4.4.11.1. Co-ordinate transportation and disposal with Consultant.
 - 4.4.11.2. Comply with applicable federal, provincial and municipal laws and regulations for generators of hazardous waste.
 - 4.4.11.3. Use licensed carrier authorized by provincial authorities to accept subject material.
 - 4.4.11.4. Before shipping material obtain written notice from intended hazardous waste treatment or disposal facility it will accept material and it is licensed to accept this material.
 - 4.4.11.5. Label containers with legible, visible safety marks as prescribed by federal and provincial regulations.
 - 4.4.11.6. Only trained personnel handle, offer for transport, or transport dangerous goods.
 - 4.4.11.7. Provide photocopy of shipping documents and waste manifests to BGIS Representative.
 - 4.4.11.8. Track receipt of completed manifest from consignee after shipping dangerous goods. Provide photocopy of completed manifest to BGIS Representative.
 - 4.4.11.9. Report discharge, emission, or escape of hazardous materials immediately to Consultant and appropriate provincial authority. Take reasonable measures to control release.
- 4.4.12. Ensure personnel have been trained in accordance with Workplace Hazardous Materials Information System (WHMIS) requirements.
- 4.4.13. Report spills or accidents immediately to Consultant. Submit a written spill report to Consultant within 24 hours of incident.
- 5. Packaging Waste Management: remove for reuse and return of packaging materials as specified in Waste Reduction Workplan in accordance with Section 01 74 19 - Waste Management and Disposal.

Part 2 Products

2.1 Materials

- 1. Description:
 - 1.1. Bring on site only quantities hazardous material required to perform Work.
 - 1.2. Maintain WHMIS Safety Data Sheets (SDS) in proximity to where materials are being used. Communicate this location to personnel who may have contact with hazardous materials.
 - 1.3. Sustainability Characteristics:

- 1.3.1. Paints in accordance with manufacturer's recommendations for surface conditions and Section 09 91 00 08 Painting for Minor Works.
 - 1.3.1.1. Primer: maximum VOC limit 250 g/L to SCAQMD Rule 1113.
 - 1.3.1.2. Paints: maximum VOC limit 50 g/L to SCAQMD Rule 1113.
 - 1.3.1.3. Coatings: maximum VOC limit 450 g/L to SCAQMD Rule 1113.
- 1.4. Spill Response Materials: provide spill response materials which can be used for absorbing/shoveling and containing hazardous materials.
- 1.5. Provide personal protective equipment.

Part 3 Execution

3.1 Cleaning

- 1. Progress Cleaning: clean in accordance with Section 01 74 00 - Cleaning.
 - 1.1. Leave Work area clean at end of each day.
- 2. Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment in accordance with Section 01 74 00 - Cleaning.
- 3. Waste Management: separate waste materials for reuse and recycling in accordance with Section 01 74 19 - Waste Management and Disposal.
 - 3.1. Dispose of hazardous waste materials in accordance with applicable federal and provincial acts, regulations, and guidelines.
 - 3.2. Recycle hazardous wastes for which there is approved, cost effective recycling process available.
 - 3.3. Send hazardous wastes to authorized hazardous waste disposal or treatment facilities.
 - 3.4. Burning, diluting, or mixing hazardous wastes for purpose of disposal is prohibited.
 - 3.5. Disposal of hazardous materials in waterways, storm or sanitary sewers, or in municipal solid waste landfills is prohibited.
 - 3.6. Dispose of hazardous wastes in timely fashion in accordance with applicable provincial regulations.
 - 3.7. Minimize generation of hazardous waste to maximum extent practicable. Take necessary precautions to avoid mixing clean and contaminated wastes.
 - 3.8. Identify and evaluate recycling and reclamation options as alternatives to land disposal, such as:
 - 3.8.1. Hazardous wastes recycled in manner constituting disposal.
 - 3.8.2. Hazardous waste burned for energy recovery.
 - 3.8.3. Lead-acid battery recycling.
 - 3.8.4. Hazardous wastes with economically recoverable precious metals.

End of Section

Section 06 40 00

Architectural Woodwork

Part 1 General

1.1 Related requirements

1. 07 92 00 - Joint Sealants: Sealant materials and application.
2. 09 91 23 - Interior Painting: Field finishing materials and application.
3. 06 10 00 - Rough Carpentry.

1.2 Reference standards

1. American National Standards Institute (ANSI)
 - 1.1. ANSI/BHMA A156.9-2010, Cabinet Hardware.
 - 1.2. ANSI/BHMA A156.11-2014, Cabinet Locks.
 - 1.3. ANSI A208.2-09, Medium Density Fiberboard (MDF) for Interior Applications.
2. Architectural Woodwork Manufacturers Association of Canada (AWMAC)
 - 2.1. Architectural Woodwork Standards (AWMAC AWS), 2014.
3. ASTM International (ASTM)
 - 3.1. [ASTM A 153/A 153M-16](#), Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware.
 - 3.2. [ASTM E 1333-14](#), Standard Test Method for Determining Formaldehyde Concentrations in Air and Emission Rates From Wood Products Using a Large Chamber.
 - 3.3. [ASTM F1667-13](#) Standard Specification for Driven Fasteners: Nails, Spikes and Staples.
4. Architectural Millwork Manufacturers Association of Canada (AWMAC)
 - 4.1. Standards of Architectural Woodwork (NMA).
 - 4.2. NMA Manual - (2014)
5. Canadian General Standards Board (CGSB)
 - 5.1. [CAN/CGSB-11.3-M87](#), Hardboard.
 - 5.2. [CAN/CGSB-71.20-M88](#), Adhesive, Contact, Brushable.
 - 5.3. [CAN/CGSB-71.19-M88](#), Adhesive, Contact, Sprayable.
6. CSA Group (CSA)
 - 6.1. CSA O112-M Series 1977 (R2006) Standards for Wood Adhesives.
 - 6.2. [CSA O121-08\(R2013\)](#), Douglas Fir Plywood.
 - 6.3. [CSA O141-05 \(R2014\)](#), Softwood Lumber.
 - 6.4. [CSA O151-14](#), Canadian Softwood Plywood.
 - 6.5. [CSA O153-M1980 \(R2014\)](#), Poplar Plywood.
 - 6.6. [CAN/CSA-Z809-08\(R2013\)](#), Sustainable Forest Management.
 - 6.7. CSA Z8000, Canadian health care facilities
7. Forest Stewardship Council (FSC)
 - 7.1. FSC-STD-01-001-2004, FSC Principle and Criteria for Forest Stewardship.

8. Health Canada/Workplace Hazardous Materials Information System (WHMIS)
 - 8.1. Safety Data Sheets (SDS).
9. National Electrical Manufacturers Association (NEMA)
 - 9.1. ANSI/NEMA LD-3-05, High-Pressure Decorative Laminates (HPDL).
10. South Coast Air Quality Management District (SCAQMD), California State, Regulation XI. Source Specific Standards
 - 10.1. SCAQMD Rule 1113-A2011, Architectural Coatings.

1.3 Preinstallation meeting

1. Before enclosing framing, convene a meeting of contractor, casework fabricator, casework installer, framing subcontractor and Consultant.
 - 1.1. Review locations of backing required for casework installation as shown on shop drawings and as necessary for installation.
 - 1.2. Review method of attachment for backing to wall system.
 - 1.3. Review coordination with other affected sections.

1.4 Action and informational submittals

1. Submit in accordance with Section 01 33 00 - Submittal Procedures.
2. Product Data:
 - 2.1. Prepare and submit material list in accordance with AWMAC AWS, cross-referenced to specifications.
 - 2.2. Include manufacturer's instructions, printed product literature, data sheets and catalogue pages for all materials and products to be incorporated into architectural wood casework and include product characteristics, performance criteria, dimensions and profiles, finish and limitations on use.
 - 2.3. Submit two copies of WHMIS SDS in accordance with Section 01 35 29.06 - Health and Safety Requirements.
3. Hardware List:
 - 3.1. Submit hardware list cross-referenced to specifications.
 - 3.2. Include manufacturer's specification sheets indicating name, model, material, function, finish, BHMA designations and other pertinent information.
4. Shop Drawings:
 - 4.1. Prepare and submit shop drawings in accordance with AWMAC AWS and as follows.
 - 4.2. Submit two sets of shop drawings for initial review in accordance with requirements of Division 01. Revise as directed, submit six copies for final acceptance and distribution.
 - 4.3. Indicate details of construction, profiles, jointing, fastening and other related details.
 - 4.3.1. Scales: profiles full size, details half full size.
 - 4.4. Indicate materials, thicknesses, finishes and hardware.
 - 4.5. Indicate locations of service outlets in casework, typical and special installation conditions, and connections, attachments, anchorage and location of exposed fastenings.
 - 4.6. Show location on casework elevations of backing required in supporting structure for attachment of casework.
 - 4.7. Indicate AWMAC AWS quality grade where different from predominant grade specified.

- 4.8. Include color schedule of all casework items, including all countertop, exposed, and semi-exposed cabinet finishes, finish material manufacturer, pattern, and color.
5. Samples:
- 5.1. Prepare and submit samples in accordance with AWMAC AWS and as follows.
- 5.2. Apply sample finishes to specified substrate or core material minimum 300 x 300 mm to match designer sample. For veneers with transparent finish submit three samples to illustrate range and colour of grain expected.
- 5.3. Shop applied coatings:
- 5.3.1. For transparent finish, submit triplicate samples of each species and cut of wood to be used, finished as specified.
- 5.3.2. For opaque finish, submit triplicate samples for each colour selection, finished as specified.
- 5.4. Submit duplicate samples of laminated plastic for each specified colour selection.
- 5.5. Submit duplicate samples of laminated plastic joints, edging, cutouts and post-formed profiles.
- 5.6. Furnish four samples of each lumber and composite panel material to Contractor for preparation of site applied finish samples in accordance with Section 09 91 23 Interior Painting.
- 5.7. Certifications: submit certificates signed by manufacturer certifying that materials comply with specified performance characteristics and physical properties.
- 5.8. Submit statement of experience and qualifications of architectural wood casework fabricator.

1.5 Quality assurance

1. Perform Work of this Section by single architectural wood casework fabricator with minimum 5 years of current architectural casework production experience and having completed minimum one project in the past 5 years with value within 20% of the cost of the work of this Section.
2. Mock-ups:
- 2.1. Construct mock-ups in accordance with Section 01 43 00 - Quality Assurance.
- 2.2. Shop prepare one base cabinet unit, counter top, complete with hardware and shop applied finishes, and install where directed by Consultant
- 2.3. Allow 24 hours for inspection of mock-up by Consultant before proceeding with Work.
- 2.4. When accepted, mock-up will demonstrate minimum standard for Work.
- 2.5. Do not proceed with work before receipt of written acceptance of mock-up by Consultant.
- 2.6. Accepted mock-up may not remain as part of finished work.

1.6 Delivery, storage and handling

1. Deliver, store and handle materials in accordance with Section 01 61 00 - Common Product Requirements and with manufacturer's written instructions.
2. Deliver wood casework only when area of work is enclosed, plaster and concrete work is dry, and area is broom clean and site environmental conditions are acceptable for installation.
3. Protect millwork against dampness and damage during and after delivery.
4. Store millwork in ventilated areas, protected from extreme changes of temperature and humidity, and within range recommended by AWMAC AWS for location of project.
5. Store materials indoors in dry location in clean, dry, well-ventilated area.
6. Protect architectural woodwork and hardware from nicks, scratches, and blemishes.
7. Replace defective or damaged materials with new.

8. Waste Management: for packaging and materials, in accordance with 01 74 19 - Waste Management and Disposal.

1.7 Warranties

1. Provide a written guarantee issued on behalf of the owner against warping, delamination or shifting of the structures for a period of 24 months additional to the 12 months required by the general conditions, for a total of (3) years.

1.8 Reinforcement and retouching

1. All required and unidentified fasteners and reinforcements will be added to ensure the strength of the assembly.
2. All alterations necessary to remove joints or corrections will be performed simultaneously, as well as for grouting electrical or mechanical appliances.

1.9 Coordination

1. Coordinate the position of all reinforcements (nailing bases) required for the execution of the works.
2. Prior to the manufacture of the furniture concerned, coordinate with the Departmental Representative equipment and mechanical, electrical, gas and other outputs whose dimensions could influence those of the furniture.

Part 2 Products

2.1 Quality grade

1. Provide all materials and perform all fabrication in accordance with AWMAC AWS Custom Grade and as follows, except where specified otherwise:
 - 1.1. Premium Grade: CT Scan Room.
2. In case of conflict between Contract Documents and AWMAC AWS grade requirements, Contract Documents govern.

2.2 Lumber

1. Softwood and Hardwood Lumber: Sound lumber to specified AWMAC AWS quality grade requirements, kiln-dried to moisture content recommended by AWMAC AWS for location of the Work
2. Machine stress-rated lumber is acceptable for all purposes.

2.3 Panel materials

1. Medium Density Fibreboard (MDF): in accordance with ANSI A208.2, Class, with a mass per unit area of 769 kg / m², CAN / CSA-Z809 or FSC or SFI certified wood.
 - 1.1. Medium Density Fibreboard Performance Requirements: to ANSI A208.2.
 - 1.2. The resin used in the manufacture of medium density fibreboard shall not contain added urea formaldehyde.

2.4 Laminated plastic materials

1. Laminated plastic for flatwork: to NEMA LD3
 - 1.1. High pressure decorative laminated (HPDL) plastic.
 - 1.1.1. Type: GP (general purpose).
 - 1.1.2. Horizontal Surfaces: HGL to suit application, 1.2 mm thick.

- 1.1.3. Vertical Surfaces: VGL to suit application, 8/10e mm thick.
- 1.1.4. Colour: integral colour throughout, multilayered.
 - 1.1.4.1. M01 : Sei Due texture, antimicrobial Lamishield protection.
Accepted product: ABET LAMINATI, COLOR 894, VIOLA FUMO, or approved equivalent.
 - 1.1.4.2. M02: Nevamar ARP Plus Carmel Sagawood Textured WM-8-350T, General Purpose
- 1.2. Thermofused Melamine: to NEMA LD3Grade LPDL, VGL.
 - 1.2.1. High wear resistant thermofused melamine: equal or exceed 400 cycles (Minimum standard for HPL abrasion test).
- 1.3. Edge finishing for doors, drawer fronts, shelves and false fronts:
 - 1.3.1. ABS: solid colour to match face, 1 mm thick.
 - 1.3.2. Matching melamine and polyester overlay edge strip with thermoplastic adhesive.
 - 1.3.3. Edges dadoed or saw kerfed to take plastic "T" moulding in width and colour to match face.
- 1.4. Laminated plastic adhesive:
 - 1.4.1. Adhesive: Contact adhesive in accordance with CAN / CGSB-71.20
 - 1.4.2. Sealants: VOC content not exceeding 120 g / L.
 - 1.4.3. Clearcoat: VOC content not exceeding 350 g / L.
 - 1.4.4. Paints: VOC content not exceeding 50 g / L.
 - 1.4.5. Product without urea-formaldehyde.

2.5 Casework fabrication - general

- 1. Fabricate casework of specified core and surface finish materials to specified AWMAC AWS quality grade
 - 1.1. Construction type: frameless.
 - 1.2. Door-cabinet interface: flush overlay.
- 2. Set nails and countersink screws apply stained wood filler to indentations, sand smooth and leave ready to receive finish.
- 3. Shop install cabinet hardware for doors, shelves and drawers. Recess shelf standards unless noted otherwise.
- 4. Shelving to cabinetwork to be adjustable unless otherwise noted.
- 5. Provide cutouts for plumbing fixtures, inserts, appliances, outlet boxes and other fixtures.
- 6. Shop assemble work for delivery to site in size easily handled and to ensure passage through building openings.
- 7. Obtain governing dimensions before fabricating items which are to accommodate or abut appliances, equipment and other materials.

2.6 Laminated plastic casework fabrication

- 1. Do laminated plastic fabrication in compliance with NEMA LD3, Annex A and specified AWMAC AWSquality grade
- 2. Ensure adjacent parts of continuous laminate work match in colour and pattern.
- 3. Veneer laminated plastic to core material in accordance with adhesive manufacturer's instructions. Ensure core and laminate profiles coincide to provide continuous support and bond over entire surface. Use continuous lengths up to 3000 mm. Keep joints 600 mm from sink cutouts.

4. Form shaped profiles and bends as indicated, using post-forming grade laminate to laminate manufacturer's instructions.
5. Use straight self-edging laminate strip for flatwork to cover exposed edge of core material. Chamfer exposed edges uniformly at approximately 20 degrees. Do not mitre laminate edges.
6. Apply laminate backing sheet to reverse side of core of plastic laminate work.
7. Apply laminated plastic liner sheet to interior of cabinetry.

2.7 Cabinet hardware

1. Cabinet hardware: to AWMAC AWSquality grade specified and to ANSI/BHMA A156.9, designated by letter B and numeral identifiers as listed below
2. Concealed hinges:
 - 2.1. Hinges: in general, for applied or semi-applied doors with nickel-plated steel casing, opening at + 110o in general and automatic closing, nickel-plated zamac mounting plate, adjustable in height. Provide 2 hinges for doors 915 mm high and less, 3 hinges for doors 1220 mm high, and 4 hinges for full height doors.
 - 2.2. Acceptable Products: Model 75T175180 Clip Top, 175H310180 Straight Receptacle, 973A050001 Blumotion Shock, and FKZ658PR Flat Head Screw, distributed by Richelieu Hardware Ltd. or equivalent as approved by the Architect.
3. Pulls: When possible, use push/pull for all cabinet doors. If not feasible, use edge pull Richelieu #BP9595128170, or approved equivalent.
4. Shelf brackets: concealed shelf support, Triade Products by Richelieu or approved equivalent.
5. Cushions:
 - 5.1. Pads (bumpers) cabinet doors: transparent rubber.
 - 5.2. Acceptable Product: Model MP531211 distributed by Richelieu, or approved equivalent.
6. Grommets:
 - 6.1. Acceptable product: Richelieu #890100, or approved equivalent.

2.8 Cabinet locks

1. Provide locks as shown on elevations.
2. Cabinet locks: to ANSI/BHMA A156.11, designated by letter E and numeral identifiers as listed below
 - 2.1. Accepted product: Richelieu # LOC807339014A or approved equivalent.

2.9 Accessories

1. Wood screws: stainless steel, type and size to suit application.
2. Nails and staples: to [CSA B111](#) and [ASTM F1667](#)
3. Splines: metal.
4. Sealant: in accordance with 07 92 00 - Joint Sealants.

2.10 Countertops

1. M01 -Corian Solid Surface : 1/2" thick in largest available sizes without apparent joints. All joints must be approved by Consultants.
 - 1.1. Color : Witch Hazel

Part 3 Execution

3.1 Examination

1. Verification of Conditions: verify conditions of substrates previously installed under other Sections or Contracts are acceptable for architectural woodwork installation in accordance with manufacturer's instructions.
 - 1.1. Visually inspect substrate in presence of Departmental Representative.
 - 1.2. Inform Departmental Representative of unacceptable conditions immediately upon discovery.
 - 1.3. Proceed with installation only after unacceptable conditions have been remedied and after receipt of written approval to proceed from Departmental Representative.
2. Verify site-dimensions before manufacturing any millwork.

3.2 Installation

1. Install architectural wood casework in accordance with AWMAC AWSgrade for respective items
2. In case of conflict between Contract Documents and AWMAC AWSgrade requirements, Contract Documents govern.
3. Install prefinished millwork at locations shown on drawings.
 - 3.1. Position accurately, level, plumb straight.
4. Fasten and anchor millwork securely.
 - 4.1. Supply and install heavy duty fixture attachments for wall mounted cabinets.
5. Countersink mechanical fasteners at exposed and semi-exposed surfaces, excluding installation attachment screws and screws securing cabinets end to end.
6. Use draw bolts in countertop joints.
7. 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.
8. At junction of plastic laminate counter back splash and adjacent wall finish, apply small bead of sealant in accordance with Section 07 92 00 - Joint Sealants.
9. Apply moisture barrier between wood framing members and masonry or cementitious construction.
10. Fit hardware accurately and securely in accordance with manufacturer's written instructions.
11. Make cutouts for inset equipment and fixtures using templates provided.

3.3 Cleaning

1. Progress Cleaning: clean in accordance with Section 01 74 00 - Cleaning.
 - 1.1. Leave Work area clean at end of each day.
2. Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment in accordance with Section 01 74 00 - Cleaning.
 - 2.1. Clean millwork and cabinet work (inside cupboards, and outside surfaces).
 - 2.2. Remove excess glue, pencil and ink marks from surfaces.
3. Waste Management: separate waste materials for reuse and recycling in accordance with Section 01 74 19 - Waste Management and Disposal.

3.4 Protection

1. Protect millwork and cabinet work from damage until final inspection.
2. Protect installed products and components from damage during construction.

3. Repair damage to adjacent materials caused by architectural woodwork installation.
4. Leave work to be site finished ready for finishing by Section 09 91 23.

End of Section

Section 07 92 00 Joint Sealants

Part 1 General

1.1 Related requirements

1. Section 09 21 16 Gypsum Wallboard Assemblies.
2. Section 09 91 00.08 Painting for Minor Works

1.2 Definitions

1. Environmental Product Declaration (EPD): Submit an Industry-wide EPD for each metal product outlined in the specification. Provide EPD with at least a cradle to gate scope, identifying the following impact categories (minimum):
 - 1.1. Global Warming Potential (GWP): Submit GWP information in the form of kgCO₂ eq.
 - 1.2. Ozone Depletion Potential (ODP): Submit ODP information in the form of kgCFC-11 eq.
 - 1.3. Acidification Potential (AP): Submit AP information in the form of kgSO₂ eq.
 - 1.4. Eutrophication Potential (EP): Submit EP information in the form of kgN eq.
 - 1.5. Smog Formation Potential (SFP): Submit SFP information in the form of kgO₃ eq. Also referred to as Photochemical ozone creation potential (POCP).

1.3 Reference standards

1. ASTM International (ASTM):
 - 1.1. [ASTM C834-17](#), Standard Specification for Latex Sealants
 - 1.2. [ASTM C919-19](#), Standard Practice for Use of Sealants in Acoustical Applications
 - 1.3. [ASTM C920-18](#), Standard Specification for Elastomeric Joint Sealants
 - 1.4. [ASTM C1193-16](#), Standard Guide for Use of Joint Sealants
 - 1.5. [ASTM C1330-18](#), Standard Specification for Cylindrical Sealant Backing for Use with Cold Liquid-Applied Sealants
 - 1.6. [ASTM C1481-12](#), Standard Guide for Use of Joint Sealants with Exterior Insulation and Finish Systems (EIFS)
 - 1.7. [ASTM D1056-20](#), Standard Specification for Flexible Cellular Materials-Sponge or Expanded Rubber
 - 1.8. [ASTM D2240-15e1](#), Standard Test Methods for Rubber Property, Durometer Hardness
 - 1.9. [ASTM D2628-91](#), Standard Specification for Preformed Polychloroprene Elastomeric Joint Seals for Concrete Pavements
2. Canadian General Standards Board (CGSB) 1330:
 - 2.1. [CAN/CGSB-19.24-M90](#), Multi-component, Chemical Curing Sealing Compound
3. Department of Justice Canada (Jus):
 - 3.1. Canadian Environmental Protection Act, 1999 (2018) (CEPA)
4. General Services Administration (GSA) - Federal Specifications (FS):
 - 4.1. FS-SS-S-200-E(2)1993, Sealants, Joint, Two-Component, Jet-Blast-Resistant, Cold Applied, for Portland Cement Concrete Pavement

5. Health Canada/Workplace Hazardous Materials Information System (WHMIS 2015):
 - 5.1. Safety Data Sheets (SDS)
 - 5.2. Sealant, Waterproofing, and Restoration Institute (SWRI): Sealants: The Professionals' Guide 2013
6. South Coast Air Quality Management District (SCAQMD), California State, Regulation XI. Source Specific Standards:
 - 6.1. SCAQMD Rule 1168-A2017, Adhesives and Sealants Applications
7. Transport Canada (TC):
 - 7.1. Transportation of Dangerous Goods Act, 1992 (2019 amended.) (TDGA)
8. ULC Standards/ UL Canada (ULC):
 - 8.1. CAN/ULC 115-2018, Standard Method of Fire Tests of Firestop Systems

1.4 Action and informational submittals

1. Submit in accordance with Section 01 33 00 - Submittal Procedures.
2. Product Data:
 - 2.1. Submit manufacturer's product data for each type of primer, backer rod, and sealants and include product characteristics, performance criteria, available colours, compatibility warnings, compliance standards and limitations.
 - 2.2. Manufacturer's product to describe:
 - 2.3. Submit one electronic copy of WHMIS 2015 SDS.
3. Samples:
 - 3.1. Submit two samples of each type of joint sealant material and colour.
 - 3.2. Submit two cured samples of exposed sealants of each colour to match adjacent material.
4. Certificates: When requested by Consultant, submit manufacturer's product certificates indicating proposed sealant is appropriate for each application on this Project.
5. Manufacturer's Instructions:
 - 5.1. Submit instructions for each type of product.
6. Sustainable Design Submittals:
 - 6.1. Submit in accordance with Section 01 33 00 Submittal Procedures.
 - 6.2. Environmental Product Declaration (EPD): Submit an Industry-wide EPD for each joint sealant product outlined in the specification. Provide EPD with at least a cradle to gate scope, identifying the following impact categories (minimum):
 - 6.2.1. Global Warming Potential (GWP): Submit GWP information in the form of kgCO₂ eq.
 - 6.2.2. Ozone Depletion Potential (ODP): Submit ODP information in the form of kgCFC-11 eq.
 - 6.2.3. Acidification Potential (AP): Submit AP information in the form of kgSO₂ eq.
 - 6.2.4. Eutrophication Potential (EP): Submit EP information in the form of kgN eq.
 - 6.2.5. Smog Formation Potential (SFP): Submit SFP information in the form of kgO₃ eq. Also referred to as Photochemical ozone creation potential (POCP).
 - 6.3. Low Emitting Materials: Provide low VOC emitting Products (within the building waterproofing membrane), in compliance with VOC emission limits referenced in sustainability program standards, for the following categories:
 - 6.4. Interior primers, adhesives, and sealants applied on site.
 - 6.5. Submit manufacturer's information indicating VOC emission limit in grams per litre (g/L).

1.5 Closeout submittals

1. Submit in accordance with Section 01 78 00 - Closeout Submittals.
2. Operation and Maintenance Data: Submit maintenance data for incorporation into manual.

1.6 Quality assurance

1. Qualifications:
 - 1.1. Manufacturer: Obtain each type of joint sealant from a single manufacturer.
 - 1.2. Minimum three years successful experience in Work of similar size and complexity.
2. Compatibility: Ensure sealants are compatible with adjacent materials and are approved by manufacture for use with adjacent materials.
3. Mock-Ups:
 - 3.1. Construct mock up in accordance with Section 01 43 00 - Quality Assurance.
 - 3.2. Before performing sealant work do sample applications of each type of sealant for review.
 - 3.3. Site locations for sample applications shall be designated by Consultant.
 - 3.4. Construct joint sealant mock-ups in assemblies of other Sections with joint sealants, which are referenced in this Section.
4. Comply with requirements of WHMIS 2015 regarding use, handling, storage, and disposal of hazardous materials; and regarding labelling and provision of Safety Data Sheets (SDS) acceptable to Health Canada.

1.7 Delivery, storage and handling

1. Perform in accordance with Section 01 61 00 - Common Product Requirements.
2. Delivery and Acceptance Requirements: Deliver materials to site in original factory packaging, with manufacturer's label.
3. Storage and Handling Requirements:
 - 3.1. Store materials off ground in a ventilated dry indoor location and in accordance with manufacturer's recommendations.
 - 3.2. Handle and dispose of hazardous materials in accordance with the CEPA, TDGA, Regional and Municipal regulations.
 - 3.3. Do not dispose of unused sealant material into sewer system, streams, lakes, onto ground or in other location where it will pose health or environmental hazard.
 - 3.4. Divert unused joint sealing material from landfill to official hazardous material collections site approved by Consultant.

1.8 Ambient conditions

1. Proceed with installation of joint sealants only when:
 - 1.1. Ambient and substrate temperature conditions are within limits permitted by joint sealant manufacturer or are above 4.4 degrees C.
 - 1.2. Joint substrates are dry.
 - 1.3. Conform to manufacturer's recommended temperatures, relative humidity, and substrate moisture content for application and curing of sealants including special conditions governing use.
2. Ventilate area of work as directed by Consultant by use of approved portable supply and exhaust fans.

1.9 Warranty

1. Manufacturer's warranty: Provide manufacturer's standard warranty documentation.
2. Warrant that sealant work will not leak, crack, crumble, melt, shrink, run, lose adhesion or stain adjacent surfaces in accordance with General Conditions, except for five years.
3. Installer's Warranty: Provide an installation warranty, installer agrees to repair or replace joint sealants that do not comply with requirements of this Section for two years from Substantial Performance.

Part 2 Products

2.1 Sustainability characteristics

1. When low toxicity sealants are not possible, confine usage to areas which off gas to exterior, are contained behind air barriers, or are applied several months before occupancy to maximize off gas time.
2. VOC emissions limits shall be as follows:
 - 2.1. Sealant Primers:
 - 2.1.1. for non-porous surfaces: 250 g/L
 - 2.1.2. for porous surfaces: 775 g/L
 - 2.1.3. for other conditions: 420 g/L
 - 2.2. Sealants:
 - 2.2.1. architectural: 250 g/L
 - 2.2.2. other conditions: 420 g/L

2.2 Performance requirements

1. Each sealant system shall meet the following requirements for warranty period:
 - 1.1. Waterproof, flexible, and compatible with substrate under applicable service conditions.
 - 1.2. Provide a weather-tight seal that does not allow moisture penetration.
 - 1.3. Shall not de-bond, crack, or craze.
 - 1.4. Shall not leak.

2.3 Sealant materials

1. In air handling units and supply air system, use sealants without strong odours, without toxic chemicals, and are mould-resistant. When low toxicity sealants are not possible, confine usage to areas which off gas to exterior, are contained behind air barriers, or are applied several months before occupancy to maximize off gas time.
2. Provide primers in accordance with manufacturer recommendation.

2.4 Sealant material designations

1. Type S-1: Acrylic Latex One Part, Shore A Hardness 20,
2. Type S-2: Silicone Sealant; mould and mildew resistant.
3. Type S-3: Silicone Sealant; general construction and air-seal sealant.
 - 3.1. To [ASTM C920](#): type S; grade NS; class 25; use NT, M, G, A, O.
4. Type S-5: Acoustical Sealant; interior, non-skimming, non-hardening, simple component synthetic rubber sealant, to [ASTM C919](#).

5. Type S-6: Multi-component polyurethane sealant; chemical curing, exterior wall sealant.
6. Type S-7: One-component polyurethane sealant; non-sag, for general construction.
7. Type S-8: Horizontal joint sealant; two component, self-levelling.
8. Type S-9: One part moisture curing, low modulus polyurethane sealant for sealing joints in level and slightly slope surfaces conforming to [ASTM C920](#), type S, grade P, class 50, use T, M, A,O, MC-1-25-B-N.
9. Type S-13: One-component polyurethane sealant; medium-modulus, non-sag, low-VOC, UV stable, to [CAN/CGSB-19.24](#).
10. Type S-14: Polysulfide two part:
 - 10.1. Self-levelling to [CAN/CGSB-19.24](#), Type 1, Class B.
 - 10.2. Non-sag: to [CAN/CGSB-19.24](#), Type 2, Class B.
11. Type S-15: Polysulfide one part:
 - 11.1. Self-levelling: to GRADE P, Class 25. Use MC-1-25-B-N.
 - 11.2. Non-sag: Grade NS, Class 25 use M, A.

2.5 Sealant selection

1. Where no specific type of sealant is scheduled, provide one of the sealants indicated in this Section appropriate for its application and consistent with manufacturer's recommendations and the recommendations of SWRI, Sealants: The Professionals' Guide.
2. Make sealant selections consistent with manufacturer's recommendations.
3. Use acrylic sealant Type S-1 only on the interior and only in situations where little or no movement can occur.
4. Use mould & mildew resistant silicone sealant Type S-2 for nonmoving joints in washrooms and kitchens. Do not use on floors.
5. Use silicone general construction sealant Type S-3 or Type S-6 and S-7 for all joints, interior and exterior, where no other specific sealant type specified.
6. Use acoustical sealant Type S-5 and air seal sealant Type S-3 only where they will be fully concealed and only where no constant or consistent air pressure difference will exist across the joint.
7. Use multi component sealant type S-6, primed penetration element surfaces other than concrete, for mechanical and electrical service penetrations in concrete foundation walls.
8. Use multi component sealant Type S-8 for horizontal joint sealant of plaza, floors and decks, exterior areas only, subject to pedestrian and vehicular traffic.
9. Use control joint sealant S-10 as filler for interior, horizontal saw cut or preformed control joints where joints are subject to load bearing conditions.
10. Use control joint sealant S-10 as filler for interior only, horizontal saw cut or preformed control joints where joints are subject to load bearing conditions.
11. Use control joint sealant S-11 as filler for interior, horizontal saw cut or preformed control joints, where joints are subject to low temperatures (freezer floors) and where joints require nosing support.
12. Use control joint sealant S-12 as filler for interior, horizontal saw cut or preformed control joints where joints are subject to thermal shock conditions, traffic loops, and where a high bond strength is required.

2.6 Accessories

1. Preformed compressible and non-compressible back-up materials that are non-staining, compatible with joint substrate, sealants, primers, and other joint fillers, and are approved for applications indicated by sealant manufacturer based on site experience and laboratory testing:
 - 1.1. Rod Type Sealant Backings:
 - 1.1.1. [ASTM C1330](#), Type C (closed cell material with a surface skin), Type O (open cell material) or Type B (bi cellular material with a surface skin).
 - 1.1.2. Provide any of the preceding types, as approved in writing by joint sealant manufacturer for joint application indicated.
 - 1.1.3. Size and density to control sealant depth and otherwise contribute to producing optimum sealant performance.
 - 1.1.4. Non adhering to sealant, to maintain two sided adhesion across joint.
 - 1.2. High Density Foam:
 - 1.2.1. Extruded closed cell polyvinyl chloride (PVC), extruded polyethylene, closed cell, Shore A hardness 20, tensile strength 140 to 200 kPa, extruded polyolefin foam, 32 kg/m³ density, or neoprene foam backer, size as recommended by manufacturer.
 - 1.3. Elastomeric Tubing Joint Fillers: Neoprene, butyl, EPDM, or silicone tubing complying with [ASTM D1056](#), non absorbent to water and gas, capable of remaining resilient at temperatures down to 15 deg C. Provide products with low compression set and of size and shape to provide a secondary seal, to control sealant depth and otherwise contribute to optimum sealant performance.
 - 1.4. Bond Breaker Tape:
 - 1.4.1. Polyethylene bond breaker tape or other tape recommended by sealant manufacturer which will not bond to sealant.
2. Preformed Sealants:
 - 2.1. Preformed Silicone Sealant System: Manufacturer's standard system consisting of pre-cured low modulus silicone extrusion, in sizes to fit joint widths indicated, combined with a neutral curing silicone sealant for bonding extrusions to substrates.
 - 2.2. Preformed Hollow Neoprene Gasket: Manufacturer's standard preformed polychloroprene elastomeric joint seal of the open cell compression type complying with [ASTM D2628](#) and with requirements for size, profile and cross sectional design.
3. Bond Breaker: Pressure-sensitive plastic tape that will not bond to sealants.
4. Joint Cleaner: Provide a non-corrosive and non-staining type, compatible with joint forming materials and sealant in accordance with sealant manufacturer's recommendations
5. Primer: Provide in accordance with sealant manufacturer's recommendations.
6. Masking Tape: Non-absorbent type, non-staining, compatible with joint sealant and joint substrates.

2.7 Colours

1. Sealant Colours: Match colour of adjacent materials where visible, as selected by Consultant, from manufacturer's standard colour range.

Part 3 Execution

3.1 Examination

1. Verification of Conditions: verify that conditions of substrate previously installed are acceptable for joint sealants installation in accordance with manufacturer's instructions.

- 1.1. Visually inspect substrate.
- 1.2. Verify joint surfaces are dry and frost free.
- 1.3. Verify substrates are without contaminants capable of interfering with sealant adhesion. Remove contaminants where occurring.
- 1.4. Examine joint sizes and conditions to establish acceptable depth to width ratio for installation of backup materials and application of sealants.
- 1.5. Verify joint widths are within the limits recommended by joint sealant manufacturer for applications indicated.
- 1.6. Inform Consultant of unacceptable conditions immediately upon discovery.
- 1.7. Proceed with installation only after unacceptable conditions have been remedied.

3.2 Surface preparation

1. Clean bonding joint surfaces of harmful contaminants including dust, rust, oil grease, and other matter which may impair adhesion.
2. Do not apply sealants to joint substrates treated with sealer, curing compound, water repellent, or other coatings unless tests have been performed to ensure compatibility of materials. Remove coatings as required.
3. Prepare surfaces in accordance with manufacturer's directions.

3.3 Priming

1. Mask adjacent surfaces prior to priming and sealing where necessary to prevent staining.
2. Prime sides of joints in accordance with sealant manufacturer's instructions immediately applying sealant, except when manufacturer's instructions explicitly state priming is not required.
3. Prime all porous material (e.g. wood, masonry, concrete, ceramic or paver tile, etc).

3.4 Backup material

1. Provide backer rod as specified, to limit depth of sealant and to act as bond breaker at back of joint.
2. Install joint filler to achieve correct joint depth and shape, with approximately 30% compression.
3. Apply paper masking tape to back of joint to act as bond break where depth of joint does not permit the use of backer rod.
4. Ensure that no joints are formed which are bonded on adjacent sides where there is any possibility of movement.

3.5 Mixing

1. Mix materials in strict accordance with sealant manufacturer's instructions.

3.6 Application

1. Sealant: Application: Apply sealants to recommendations of [ASTM C1193](#), [ASTM C1481](#), and in accordance with manufacturer's instructions, and as follows:
 - 1.1. Apply sealant within recommended temperature ranges. Consult manufacturer when sealant cannot be applied within recommended temperature range.
 - 1.2. Mask edges of joint where irregular surface or sensitive joint border exists to provide neat joint.
 - 1.3. For joints where movement is possible, apply backer rod to achieve a joint depth of one half the joint width but not less than 9 mm; for joints larger than 25 mm use a depth of 13 mm
 - 1.4. Apply sealant in a continuous beads.

- 1.5. Apply sealant using gun with proper size nozzle.
- 1.6. Fill voids and joints solid.
- 1.7. Form sealant surface with a smooth full bead, without ridges, wrinkles, sags, air pockets, embedded impurities.
- 1.8. Tool exposed surfaces before skinning begins to give slightly concave shape.
- 1.9. Ensure bead is solid, filling entire space between sides and bedding material, exerting sufficient pressure to obtain maximum bond, by allowing sealant to bulge out in advance of nozzle.
- 1.10. Apply sealant within recommended temperature ranges. Consult manufacturer when sealant cannot be applied within recommended temperature range.
- 1.11. Seal at all locations where dissimilar material meet.
2. Sealant Curing:
 - 2.1. Cure sealants in accordance with sealant manufacturer's instructions.
 - 2.2. Do not cover up sealants until after curing has completed.

3.7 Cleaning

1. Progress Cleaning: Clean in accordance with Section 01 74 00 - Cleaning.
 - 1.1. Clean adjacent surfaces immediately of excess primers and sealants.
 - 1.2. Remove excess and droppings, using recommended cleaners as work progresses.
 - 1.3. Remove masking tape after initial set of sealant.
2. Final Cleaning: Perform in accordance with Section 01 74 00 - Cleaning upon completion.
3. Waste Management: Perform in accordance with Section 01 74 19 - Waste Management and Disposal.
 - 3.1. Do not dispose of unused sealant materials into sewer system, streams, lakes, onto ground, or other location where it might pose a health or environmental hazard.
 - 3.2. Divert unused sealants from landfill to a hazardous material collection site.
 - 3.3. Place materials defined as hazardous or toxic in designated containers.
 - 3.4. Dispose of hazardous materials in accordance with the CEPA, TDGA, regional and municipal regulations.

3.8 Protection

1. Protect installed products and components from damage during construction.
2. Repair damage to adjacent materials caused by joint sealants installation.

3.9 Schedule

1. Use acrylic sealant Type S-1 only on the interior and only where little or no movement can occur.
2. Use mould and mildew-resistant silicone sealant Type S-2 for non-moving joints in washrooms and kitchens. Do not use on floors.
3. Use silicone general construction sealant Type S-3 or Type S-6 and S-7 for all joints, interior and exterior, where no other specific sealant type is specified.
4. Use acoustical sealant Type S-5 only where they will be fully concealed and only where no constant or consistent air pressure difference will exist across the joint.
5. Use multicomponent sealant type S-6, primed penetration element surfaces other than concrete, for mechanical and electrical service penetrations in concrete foundation walls.

6. Use multicomponent sealant type S-6, at perimeters of exterior openings where frames meet exterior facade of building (e.g., brick, block, precast masonry).
7. Use multicomponent sealant Type S-8 for horizontal joint sealant of plaza, floors and decks, exterior areas only, subject to pedestrian and vehicular traffic.
8. Use sealant Type S-8 for exterior joints in horizontal wearing surfaces.
9. Use polyurethane, semi-self-levelling sealant Type S-9 for in expansion joints in sidewalks, plazas, floors and other pedestrian and vehicular horizontal surfaces with slopes up to 6%.
10. Use control joint sealant S-10 as filler for interior, horizontal saw cut or preformed control joints where joints are subject to load bearing conditions.
11. Use control joint sealant S-11 as filler for interior, horizontal saw cut or preformed control joints, where joints are subject to low temperatures (freezer room floors) and where joints require nosing support.
12. Use control joint sealant S-12 as filler for interior, horizontal saw cut, or preformed control joints where joints are subject to thermal shock conditions, traffic loops, and where a high bond strength is required.
13. Use sealant S-13 for exterior holes and penetrations around pipes and other services passing through concrete foundations and requiring greater movement capability.
14. Use sealant S-16 in pavement wherever fuel oils may be present
15. In addition, provide joint sealants at the following conditions:
16. Seal control joints in gypsum board , except where prefabricated control joints are specified.
17. Seal joints in floors and walls and around service and mechanical and electrical fixture penetrations.
18. Coping joints and coping-to facade joints.
19. Cornice and wash (or horizontal surface joints).
20. Joints of underside of precast beams or planks.
21. Movement, control and expansion joints on the interior of exterior surfaces of unit masonry walls.
22. Interior control and expansion joints in floor surfaces.
23. Exposed interior control joints in gypsum board.
24. Seal at all locations where dissimilar material meet.

End of Section

Section 08 71 00 Door Hardware

Part 1 General

1.1 Related requirements

1. Section 08 11 13 - Hollow Metal Doors and Frames
2. Section 08 14 00 - Wood Doors

1.2 Reference standards

1. Canadian Steel Door Manufacturers' Association (CSDMA):
2. CSA Group (CSA):
 - 2.1. [CSA B651-18](#), Accessible Design for the Built Environment
3. Door and Hardware Institute (DHI):
 - 3.1. Sequence and Format for the Hardware Schedule, 2019
4. National Fire Protection Association (NFPA):
 - 4.1. [NFPA 80-2013](#), Standard for Fire Doors and Other Opening Protectives

1.3 Administrative requirements

1. Coordination: Obtain and distribute templates for doors, frames, and other work specified to be factory prepared for installing door hardware. Coordinate with shop drawings or other Sections. Confirm that adequate provisions are made for locating and installing door hardware in accordance with indicated requirements, and as follows:
 - 1.1. Coordinate with Section 26 08 00 - Commissioning of Electrical for type of wire required for electrified hardware, schedule for installation, and connection to electrified door hardware.
 - 1.2. Coordinate layout and installation of electrified door hardware with connections to power supplies, fire alarm system and detection devices and building management system with Section 28 10 00 - Access Control and 28 46 00 - Fire Detection and Alarm.
 - 1.3. Coordinate with electrical Subcontractor for provision of service to each electrical door operator.
 - 1.4. Coordinate with electrical Subcontractor for electrical conduit and wiring from specified electrical door controls to door operators.
 - 1.5. Coordinate door hardware and electrified operators with Section 08 11 13 - Hollow Metal Doors and Frames.

1.4 Action and informational submittals

1. Submit in accordance with Section Section 01 33 00 - Submittal Procedures.
2. Product Data:
 - 2.1. Submit manufacturer's product data for each type of door hardware. Include product characteristics, performance criteria, profiles, dimensions, finishes, and limitations.
3. Shop Drawings: Submit shop drawings indicating details of electrified door hardware including the following:
 - 3.1. Detailed interface between electrified door hardware and access control system.
 - 3.2. Theory of operation for electrified door hardware groups.

4. **Contract Door Hardware Schedule:** Submit schedule prepared by or under the supervision of a qualified hardware consultant detailing fabrication and assembly of door hardware.
 - 4.1. Comply with DHI Sequence and Format for the Hardware Schedule.
 - 4.2. Organize the door hardware schedule into door hardware groups indicating a complete description of every item required for each door (or opening).
 - 4.3. Indicate hardware make, model, material, function, handing, size, fastening, and finish using codes in BHMA A156.18, and other pertinent information.
 - 4.4. Include keying schedule describing how each locking device is keyed in accordance with ANSI/BHMA A156.28. Index each key type to a specific door number.
 - 4.5. Indicate location of each door hardware set, cross-referencing door numbers indicated in the Contract Documents.
 - 4.6. Include an explanation of abbreviations, symbols, and alphanumeric codes in contract hardware schedule, where applicable.
 - 4.7. Include description of each electrified door hardware function, sequence of operation, and coordinating interface with other systems (e.g., fire alarm).
 - 4.8. Include DHI certification stamp on contract door hardware schedule.
5. **Test Reports:** When requested, submit certified test reports showing a product's compliance to a specified referenced standard.
6. **Manufacturer's Instructions:** Submit manufacturer's installation instructions.
7. **Construction Waste Management:**
 - 7.1. Submit project Waste Management Plan highlighting recycling and salvage requirements.
 - 7.2. Submit calculations on end-of-project recycling rates, salvage rates, and landfill rates demonstrating that 50% of construction wastes were recycled or salvaged.
 - 7.3. Recycled Content:
 - 7.3.1. Submit listing of recycled content products used, including details of required percentages or recycled content materials and products, showing their costs and percentages of post-consumer and post-industrial content, and total cost of materials for project.

1.5 Closeout submittals

1. Submit in accordance with Section Section 01 78 00 - Closeout Submittals.
2. **Operation and Maintenance Data:** Submit operation and maintenance data for door hardware and incorporate into manual.
3. **Warranty Documentation:** Submit manufacturer's material and fabrication warranty.
4. Schedule a 4-hour training session to demonstrate to the Owner's maintenance personnel the procedures for the use, cleaning of hardware and how to perform preventive maintenance.

1.6 Maintenance material submittals

1. **Extra Stock Materials:** Supply maintenance materials in accordance with Section 01 78 00 - Closeout Submittals.
 - 1.1. Tools: Supply two (2) sets of wrenches for door closers, locksets and fire exit hardware.

1.7 Quality assurance

1. **Regulatory Requirements:**
 - 1.1. Hardware for doors in fire separations and exit doors certified by a Canadian Certification Organization accredited by the Standards Council of Canada.

- 1.2. Certificates: product certificates signed by manufacturer certifying materials comply with specified performance characteristics and criteria and physical requirements.
- 1.3. Manufacturer Qualifications: Engage qualified manufacturers with a minimum 5 years of documented experience in producing hardware and equipment similar to that indicated for this Project and that have a proven record of successful in-service performance.
- 1.4. Installer Qualifications: A minimum 3 years documented experience installing both standard and electrified door hardware similar in material, design, and extent to that indicated for this Project and whose work has resulted in construction with a record of successful in-service performance.
- 1.5. Door Hardware Supplier Qualifications: Experienced commercial door hardware distributors with a minimum 5 years documented experience supplying both mechanical and electromechanical hardware installations comparable in material, design, and extent to that indicated for this Project. Supplier recognized as a factory direct distributor by the manufacturers of the primary materials with a warehousing facility in Project's vicinity. Supplier to have on staff a certified Architectural Hardware Consultant (AHC) available during the course of the Work to consult with Contractor, Architect, and Owner concerning both standard and electromechanical door hardware and keying.
- 1.6. Automatic Operator Supplier Qualifications: Power operator products and accessories are required to be supplied and installed through current members of the manufacturer's "Power Operator Preferred Installer" program. Suppliers are to be factory trained, certified, and a direct purchaser of the specified power operators and be responsible for the installation and maintenance of the units and accessories indicated for the Project.
- 1.7. Source Limitations: Obtain each type and variety of door hardware specified in this section from a single source unless otherwise indicated.
 - 1.7.1. Electrified modifications or enhancements made to a source manufacturer's product line by a secondary or third party source will not be accepted.
 - 1.7.2. Provide electromechanical door hardware from the same manufacturer as mechanical door hardware, unless otherwise indicated.
- 1.8. At completion of installation, provide written documentation that components were applied to manufacturer's instructions and recommendations and according to approved schedule.

1.8 Delivery, storage, and handling

1. Deliver, store and handle materials in accordance with Section 01 61 00 - Common Product Requirements and with manufacturer's written instructions.
2. Delivery and Acceptance Requirements: Deliver materials to site in original factory packaging and with manufacturer's labels.
3. Package hardware items, including fasteners, separately or in groups of related hardware. Protect prefinished surfaces with wrapping, strippable coating, or other protective packaging. Label each package with their contents and location in building.
4. Storage and Handling Requirements:
 - 4.1. Inventory door hardware on receipt and provide secure lock-up and shelving for door hardware delivered to Project site. Do not store electronic access control hardware, software or accessories at Project site without prior authorization.
 - 4.2. Deliver, as applicable, permanent keys, cylinders, cores, access control credentials, software and related accessories directly to Owner via registered mail or overnight package service. Instructions for delivery to the Owner shall be established at the "Keying Conference".
 - 4.3. Tag each item or package separately with identification related to the final Door Hardware Schedule, and include basic installation instructions with each item or package.

- 4.4. Store materials off ground, indoors, and in dry location in accordance with manufacturer's recommendations in clean, dry, well-ventilated area.
- 4.5. Store and protect door hardware from nicks, scratches, and blemishes.
- 4.6. Protect prefinished surfaces with wrapping and strippable coating.
- 4.7. Replace defective or damaged materials with new.
- 5. Develop Construction Waste Management Plan related to Work of this Section.
- 6. Packaging Waste Management: remove for reuse by manufacturer of pallets, crates, padding, and packaging materials as specified in Construction Waste Management Plan in accordance with Section 01 74 21 - Construction/Demolition Waste Management and Disposal.

1.9 Warranty

- 1. General Warranty: Reference Division 01, General Requirements. Special warranties specified in this Article shall not deprive Owner of other rights. Owner may have under other provisions of the Contract Documents and shall be in addition to, and run concurrent with, other warranties made by Contractor under requirements of the Contract Documents.
- 2. Warranty Period: Written warranty, executed by manufacturer(s), agreeing to repair or replace components of standard and electrified door hardware that fails in materials or workmanship within specified warranty period after final acceptance by the Owner. Failures include, but are not limited to, the following:
 - 2.1. Structural failures including excessive deflection, cracking, or breakage.
 - 2.2. Faulty operation of the hardware.
 - 2.3. Deterioration of metals, metal finishes, and other materials beyond normal weathering.
 - 2.4. Electrical component defects and failures within the systems operation.
- 3. Standard Warranty Period: One year from date of Substantial Completion, unless otherwise indicated.
- 4. Special Warranty Periods: The warranty shall cover the cost of any expenses incurred in the repair of prescribed defects and any other damage to the building resulting from defects in the work of this section.
 - 4.1. Ten years for mortise locks and latches.
 - 4.2. Five years for standard duty cylindrical (bored) locks and latches. Twenty five years for manual surface door closer bodies.

1.10 Maintenance Service

- 1. Maintenance Tools and Instructions: Furnish a complete set of specialized tools and maintenance instructions as needed for Owner's continued adjustment, maintenance, and removal and replacement of door hardware.

Part 2 Products

2.1 Hardware Items

- 1. General: Provide door hardware for each door to comply with requirements in Door Hardware Sets and each referenced section that products are to be supplied under.
- 2. Designations: Requirements for quantity, item, size, finish or color, grade, function, and other distinctive qualities of each type of door hardware are indicated in the Door Hardware Sets at the end of Part 3. Products are identified by using door hardware designations.

3. Named Manufacturer's Products: Product designation and manufacturer are listed for each door hardware type required for the purpose of establishing requirements. Manufacturers' names are abbreviated in the Door Hardware Schedule.
4. Substitutions: Requests for substitution and product approval for inclusive mechanical and electromechanical door hardware in compliance with the specifications must be submitted in writing and in accordance with the procedures and time frames outlined in Division 01, Substitution Procedures. Approval of requests is at the discretion of the architect, owner, and their designated consultants.
5. Use products from only one manufacturer for similar items.
6. All hardware is to support the immense weight of the lead lined doors and maintain the integrity of the radiation shield.

2.2 Fastenings

1. Use only fasteners provided by the manufacturer. Failure to comply may void warranties and applicable licensed labels.
2. Supply screws, bolts, expansion shields and other fastening devices required for satisfactory installation and operation of hardware.
3. Match exposed fastening devices to finish of hardware.
4. Where pull is positioned on one side of the door and push plate on the other side, supply fastening devices, and install to secure pull through the door from the reverse side. Install push plate to cover fasteners.
5. Use fasteners compatible with the material they are used in.

2.3 Keying

1. General: Cylinder manufacturer to have minimum (10) years experience designing secured master key systems and have on record a published security keying system policy.
2. The key system must be coordinated with the Client locksmith and the Building Manager. The contractor is responsible for initiating and coordinating the work with the cylinder and key supplier authorized by the Client. The cylinders must comply with the Federal Keying System. The supply and installation of cylinders and keys must be performed by Owner's locksmith.
3. All keys, including master keys and list of keys must be provided and forwarded directly to the Owner in clearly identified envelopes.
4. Padlocks and locks for cabinets and doors shall be keyed as directed by the Departmental Representative. Prepare a detailed list of keys in collaboration with the Departmental Representative.
5. The locks on doors and cabinets must be controlled by different keys and subject to master keys and a large master key outside the building system. Validate everything with the customer before ordering and manufacturing.
6. All cylinders will be subject to the Owner's Master Key System, as required by the Owner.
7. Provide temporary cylinder supply and installation for the duration of the work. The permanent cylinders will be installed at the end of the work before the possession by the Owner when required by the latter.
8. Leave construction keys in place, or hand them to Owner.
9. Cylinders: Original manufacturer cylinders complying with the following:
 - 9.1. Mortise Type: Threaded cylinders with rings and cams to suit hardware application.
 - 9.2. Mortise and rim cylinder collars to be solid and recessed to allow the cylinder face to be flushed and be free spinning with matching finishes.

10. Keying System: Each type of lock and cylinders to be factory keyed.
 - 10.1. Conduct specified "Keying Conference" to define and document keying system instructions and requirements.
 - 10.2. Furnish factory cut, nickel-silver large bow permanently inscribed with a visual key control number as directed by Owner.
 - 10.3. Existing System: Key locks to Owner's existing system.
11. Key Quantity: Provide the following minimum number of keys:
 - 11.1. Change Keys per Cylinder: Two (2) Three (3).
 - 11.2. Master Keys (per Master Key Level/Group): Five (5).
 - 11.3. Construction Keys (where required): Ten (10).
 - 11.4. Hand over permanent cores and keys to Departmental Representative.
 - 11.5. Doors, padlocks, and cabinet locks to be keyed as directed by the Owner's representative. Prepare detailed keying schedule in conjunction with Departmental Representative.
 - 11.6. Supply keys in duplicate for every lock in this Contract.
 - 11.7. Supply four (4) master keys for each master key or grand master key group.
 - 11.8. Stamp keying code numbers on keys and cylinders.
 - 11.9. Supply construction cores.
 - 11.10. Hand over permanent cores and keys to Departmental Representative.
12. Construction Keying: Provide construction master keyed cylinders.
13. Key Registration List (Bitting List):
 - 13.1. Provide keying transcript list to Owner's representative in the proper format for importing into key control software.
 - 13.2. Provide transcript list in writing or electronic file as directed by the Owner.
 - 13.3. Stamp keying code numbers on keys and cylinders.
14. Electronic Key Management System: Provide an electronic key control system with Stand-alone Plug and Play features including advanced RFID technology. Touchscreen interface with PIN access for keys individually locked in place. Minimum 1,000 system users and 21 iFobs for locking receptors. System shall have a minimum 250,000 audit events screen displayed or ability to be exported via USB port.
15. Doors, padlocks, and cabinet locks to be keyed as directed by the Owner's representative. Prepare detailed keying schedule in conjunction with Departmental Representative.

2.4 Mechanical Locks and Latching Devices

1. Mortise Locksets, Grade 1 (Heavy Duty): ANSI/BHMA A156.13, Series 1000, Operational Grade 1 certified. Locksets are to be manufactured with a corrosion resistant steel case and be field-reversible for handing without disassembly of the lock body.

2.5 Lock and latch strikes

1. Strikes: Provide manufacturer's standard strike with strike box for each latch or lock bolt, with curved lip extended to protect frame, finished to match door hardware set, unless otherwise indicated, and as follows:
 - 1.1. Flat-Lip Strikes: For locks with three-piece antifriction latch bolts, as recommended by manufacturer.
 - 1.2. Extra-Long-Lip Strikes: For locks used on frames with applied wood casing trim.

- 1.3. Aluminum-Frame Strike Box: Provide manufacturer's special strike box fabricated for aluminum framing.
- 1.4. Double-lipped strikes: For locks at double acting doors. Furnish with retractable stop for rescue hardware applications.
- 2. Standards: Comply with the following:
 - 2.1. Strikes for Mortise Locks and Latches: BHMA A156.13.
 - 2.2. Strikes for Bored Locks and Latches: BHMA A156.2.
 - 2.3. Strikes for Auxiliary Deadlocks: BHMA A156.36.
 - 2.4. Dustproof Strikes: BHMA A156.16.

2.6 Fabrication

- 1. Fasteners: Provide door hardware manufactured to comply with published templates generally prepared for machine, wood, and sheet metal screws. Provide screws according to manufacturers recognized installation standards for application intended.

2.7 Finishes

- 1. Standard: Designations used in the Hardware Sets and elsewhere indicate hardware finishes complying with ANSI/BHMA A156.18, including coordination with traditional U.S. finishes indicated by certain manufacturers for their products.
- 2. Provide quality of finish, including thickness of plating or coating (if any), composition, hardness, and other qualities complying with manufacturer's standards, but in no case less than specified by referenced standards for the applicable units of hardware.
- 3. Protect mechanical finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.

Part 3 Execution

3.1 Examination

- 1. Examine scheduled openings, with Installer present, for compliance with requirements for installation tolerances, labeled fire door assembly construction, wall and floor construction, and other conditions affecting performance.
- 2. Notify architect of any discrepancies or conflicts between the door schedule, door types, drawings and scheduled hardware. Proceed only after such discrepancies or conflicts have been resolved in writing.

3.2 Preparation

- 1. Hollow Metal Doors and Frames: Comply with ANSI/DHI A115 series.
- 2. Wood Doors: Comply with ANSI/DHI A115-W series.

3.3 Installation

- 1. Manufacturer's Instructions: Comply with manufacturer's recommendations, including product technical bulletins, product catalogue installation instructions, product carton installation instructions, and data sheets.
- 2. Provide metal door and frame manufacturers with complete instructions and templates for preparation of their work to receive hardware.
- 3. Provide manufacturers' instructions for proper installation of each hardware component.

4. Install hardware to standard hardware location dimensions in accordance with CSDFMA Canadian Metric Guide for Steel Doors and Frames (Modular Construction).
5. Where door stop comes into contact with door pull, mount stop to strike bottom of pull.
6. Install key control cabinet.
7. Use only manufacturer's supplied fasteners.
 - 7.1. Use of "quick" type fasteners, unless specifically supplied by manufacturer, is unacceptable.
8. Remove construction cores and locks when directed by Departmental Representative.
 - 8.1. Install permanent cores and confirm locks operate correctly.

3.4 Checks and adjustments

1. Check and adjust each hardware component of each door and ensure proper operation.
2. Check all keys and master keys and replace defective keys and cylinders.
3. Verify door closers after pressurization and final adjustment of building systems have been completed.
4. Installed hardware must operate smoothly, without undue noise and without blocking, with fasteners and accessories of the appropriate type.
5. Lubricate moving parts with a product recommended by the hardware manufacturer.
6. Replace items that can not be adjusted and lubricated to function properly.

3.5 Adjusting

1. Adjust door hardware, operators, closures and controls for optimum, smooth operating condition, safety and for weather tight closure.
2. Lubricate hardware, operating equipment and other moving parts.
3. Adjust door hardware to ensure tight fit at contact points with frames.

3.6 Cleaning

1. Progress Cleaning: Perform in accordance with Section 01 74 00 - Cleaning and as follows:
 - 1.1. Leave Work area clean at end of each day.
 - 1.2. Clean hardware with damp rag and approved non-abrasive cleaner, and polish hardware in accordance with manufacturer's instructions.
 - 1.3. Remove protective coatings and wrappings from hardware items.
 - 1.4. Final Cleaning: Upon completion remove surplus materials, rubbish, tools and equipment in accordance with Section 01 74 00 - Cleaning.
2. Waste Management: separate waste materials for reuse and recycling in accordance with Section 01 74 21 - Construction/Demolition Waste Management and Disposal.
 - 2.1. Remove recycling containers and bins from site and dispose of materials at appropriate facility.

3.7 Demonstration

1. Keying System Setup and Cabinet:
 - 1.1. Set up key control system with file key tags, duplicate key tags, numerical index, alphabetical index, key change index, label shields, control book and key receipt cards.
 - 1.2. Place file keys and duplicate keys in key cabinet on their respective hooks.
 - 1.3. Lock key cabinet and provide key to Departmental Representative.

2. Maintenance Staff Briefing: Brief maintenance staff regarding the following:
 - 2.1. Proper care, cleaning, disinfecting, and general maintenance of hardware.
 - 2.2. Description, use, handling, and storage of keys.
 - 2.3. Use, application and storage of wrenches for door closers, locksets and fire exit hardware.
3. Demonstrate operation, operating components, adjustment features, and lubrication requirements.

3.8 Protection

1. Protect installed products and components from damage during construction.
2. Repair damage to adjacent materials caused by door hardware installation.

3.9 Door hardware schedule

1. The hardware sets represent the design intent and direction of the owner and architect. They are a guideline only and should not be considered a detailed hardware schedule. Discrepancies, conflicting hardware and missing items should be brought to the attention of the architect with corrections made prior to the bidding process. Omitted items not included in a hardware set should be scheduled with the appropriate additional hardware required for proper application and functionality. All items should support the immense weight and maintain the integrity of the radiation shield.
2. **Hardware Group No. 1:**
 - 2.1.6 - Butt Hinges, 4½" × 4½", Stainless Steel, Grade 1, NRP
 - 2.1.1. Product: McKinney TA 386, or equivalent
 - 2.1.2. Finish: C32D
 - 2.2.1 - Grade 1 Mortise Lock, Office Function (F05), Inside Thumbturn, Outside Key Override, Return Levers, 630 Finish, Lead lined
 - 2.2.1. Product: Sargent 8205-NLJ, Schlage L9070, Corbin Russwin ML2057
 - 2.2.2. Finish: C32D
 - 2.3.1 - Key Cylinder, Owner Keyed, Construction Core as required
 - 2.3.1. Product: Match lock manufacturer
 - 2.4.1 - Automatic Flush Bolts, 8-1/2" (216 mm), Top Only, Inactive Leaf
 - 2.4.1. Product: Rockwood 2940, or equivalent
 - 2.4.2. Finish: C32D
 - 2.5.1 - Heavy-Duty Surface Door Closers, Parallel Arm, Adjustable Spring Power, Delayed Action, Backcheck, Suitable for Lead-Lined Doors
 - 2.5.1. Product: Sargent 351-P10, or equivalent
 - 2.5.2. Finish: EN
 - 2.6.2 - Door Sweep, Clear Aluminum with Brush, Surface Mount
 - 2.6.1. Product: KN Crowder W-24S, or equivalent
 - 2.7.2 - Wall Stop, Concealed Fasteners, Coordinate location with room layout
 - 2.7.1. Product: Gallery GSH240B, or equivalent
 - 2.7.2. Finish: C32D
 - 2.8.2 - 10" (250 mm) High Kick Plate, 16 ga Stainless Steel
 - 2.8.1. Product: Rockwood K1050, Ives 8400 Series, Trimco 1000 Series
 - 2.8.2. Finish: US32D
 - 2.9.2 - Frame Protection, Stainless Steel (Type 304), Full Wrap, Jambs Only

- 2.9.1. Product: Gallery GSH50N, or equivalent
- 2.9.2. Finish: 32D
- 2.10. 1 - Acoustic Perimeter Seals, Silicone, Self-adhered
 - 2.10.1. Product: KN Crowder W-22, or equivalent
 - 2.10.2. Finish : BL

End of Section

Section 09 51 13

Acoustical Panel Ceilings

Part 1 General

1.1 Related requirements

1. Section 23 37 13 - Diffusers, Registers and Grilles (specifically mechanical units in acoustical panel ceilings)
2. Section 26 50 00 – Lighting

1.2 Definitions

1. Articulation Classification (AC): Indication of attenuation of sound being reflected from ceiling materials to adjacent areas in open plan areas, in accordance with ASTM E1111/E1111M.
2. Ceiling Attenuation Class (CAC): Indication of amount of attenuation of sound passing up through a panel through the open plenum and back down through a panel into adjacent spaces where a partition is not full height, in accordance with ASTM E1414/E1414M.
3. Light Reflectance (LR): The percentage amount of light returned from the surface of a material compared to the source.
4. Noise Reduction Coefficient (NRC): Measure of the absorption of sound energy over four frequencies. An indication of the amount of noise a panel can absorb - measured in 0.05 increments in accordance with ASTM C423.
5. Sound Absorption Average (SAA): Measure of the absorption of sound energy over twelve frequencies. An indication of the amount of sound a panel can absorb - measured in 0.01 increments in accordance with ASTM C423.

1.3 Reference standards

1. ASTM International (ASTM):
 - 1.1. ASTM A580/A580M-18, Standard Specification for Stainless Steel Wire
 - 1.2. ASTM A641/A641M-19, Standard Specification for Zinc-Coated (Galvanized) Carbon Steel Wire
 - 1.3. ASTM C423-17, Standard Test Method for Sound Absorption and Sound Absorption Coefficients by the Reverberation Room Method
 - 1.4. ASTM C635/C635M-17, Standard Specifications for the Manufacture, Performance and Testing of Metal Suspension Systems for Acoustical Tile and Lay-In Panel Ceilings
 - 1.5. ASTM C636/C636M-19, Standard Practice for Installation of Metal Ceiling Suspension Systems for Acoustical Tile and Lay-In Panels
 - 1.6. ASTM E580/E580M-20 Standard Practice for Installation of Ceiling Suspension Systems for Acoustical Tile and Lay-in Panels in Areas Subject to Earthquake Ground Motions
 - 1.7. ASTM E1111/E1111M-14, Standard Test Method for Measuring the Interzone Attenuation of Open Office Components
 - 1.8. ASTM E1264-19, Standard Classification for Acoustical Ceiling Products
 - 1.9. ASTM E1414/E1414M-21a, Standard Test Method for Airborne Sound Attenuation between Rooms Sharing a Common Ceiling Plenum
 - 1.10. ASTM E1477-98a, Standard Test Method for Luminous Reflectance Factor of Acoustical Materials by Use of Integrating-Sphere Reflectometers

- 1.11. ASTM F1667-18a Standard Specification for Driven Fasteners: Nails, Spikes and Staples
2. Canadian General Standards Board (CGSB):
 - 2.1. CAN/CGSB-51.34-M86, Vapour Barrier, Polyethylene Sheet for Use in Building Construction
3. Ceilings & Interior Systems Construction Association (CISCA):
 - 3.1. Ceiling Systems Handbook, 2019
 - 3.2. Seismic Construction Handbook, 2018
4. CSA Group (CSA):
 - 4.1. CSA S832-14, Seismic Risk Reduction of Operational and Functional Components (OFCs) of Buildings
 - 4.2. CSA Z8000, Canadian Health Care Facilities – Planning, Design and Construction
5. Government of Canada:
 - 5.1. Workplace Fit-Up Standards 2.0
6. ULC Standards (ULC):
 - 6.1. CAN/ULC-S102-10, Standard Method of Test for Surface Burning Characteristics of Building Materials and Assemblies
 - 6.2. CAN/ULC-S702.1-14, Standard for Mineral Fibre Thermal Insulation for Buildings, Part 1: Material Specification

1.4 Coordination

1. Do not begin installation of ceiling suspension system until work above ceiling has been reviewed by Consultant.
2. Coordinate ceiling work to accommodate components of other Sections built into acoustical ceilings, including the following:
 - 2.1. Section 23 37 13 - Diffusers, Registers and Grilles (specifically mechanical units in acoustical panel ceilings)
 - 2.2. Section 26 50 00 – Lighting
 - 2.3. Section 26 52 00.01 - Lighting - Central Emergency System

1.5 Pre-installation meetings

1. Conduct pre-installation meeting in accordance with Section 01 31 19 – Project Meetings at Project site one week before beginning on-site installation, with Contractor, applicable Subcontractors, and Consultant to:
 - 1.1. verify Project requirements,
 - 1.2. discuss coordination with work of other Sections,
 - 1.3. review manufacturer's installation instructions and warranty conditions,
 - 1.4. discuss and coordinate exact locations of ceiling-mounted components,
 - 1.5. discuss accepted shop drawings for special installation details, and
 - 1.6. review existing substrate conditions.

1.6 Sequencing

1. Schedule installation of acoustical panel ceilings to occur after completion of overhead mechanical and electrical work, where possible.
2. Begin installation after building envelope, and dust and moisture producing activities are complete, and paint is dry.

1.7 Action and informational submittals

1. Submit samples in accordance with Section 01 33 00 - Submittal Procedures.
2. Product Data: Submit manufacturer's installation instructions, product literature, and data sheets for ceiling suspension system, acoustic panels, and system accessories. Include product characteristics, performance criteria, physical sizes, finishes, and limitations.
3. Shop Drawings:
 - 3.1. Submit reflected ceiling plans for special grid patterns as indicated on Drawings.
 - 3.2. Indicate lay-out, insert and hanger spacing and fastening details, splicing method for main and cross runners, change in level details,.
4. Samples for Initial Selection:
 - 4.1. Submit actual samples of acoustical panel that are 150 mm x 150 mm showing full range of colours, textures, and patterns available.
 - 4.2. Submit samples that are approximately 200 mm long of each ceiling suspension system component exposed to view showing full range of profiles, colours, and gloss levels.
5. Samples for Verification:
 - 5.1. Submit 150 mm x 100 mm samples of each type of acoustical panel.
 - 5.2. Submit for review and acceptance of each component specified or necessary for complete installation. Include technical descriptive data.
 - 5.3. Submit samples of each component proposed for use in each type of ceiling suspension system.
6. Delegated Design Submittals:
 - 6.1. Submit delegated design shop drawings stamped and signed by professional engineer registered or licensed in Province of British Columbia, Canada.
 - 6.2. Indicate that components and installation methods conform to specified seismic design and construction requirements of Contract Documents and in accordance with ASTM E580/E580M.
 - 6.3. Include supporting details, treatment of cross runners, main runners, and wall closures at terminal ends, suspension wire, lateral force bracing, light fixtures, services within the ceiling, seismic isolation joints, and partition bracing.
7. Test Reports: Submit test data indicating that fasteners and anchors used to suspend ceiling systems have a minimum capacity of 890 N in tension, and anchors to attach bracing wires have minimum a capacity of 1960 N in tension.

1.8 Closeout submittals

1. Submit in accordance with Section 01 78 00 - Closeout Submittals.
2. Submit maintenance information for acoustical ceiling systems and incorporate into manual. Include warnings of cleaning methods that may damage finished surfaces.
3. Submit final certificate from design professional responsible for delegated detail design of ceiling indicating conformity with accepted shop drawings.

1.9 Maintenance material submittals

1. Supply extra acoustical units in accordance with Section 01 78 00 - Closeout Submittals.
2. Supply extra materials from same production run as installed materials.
3. Supply acoustical units amounting to 2% of gross ceiling area for each pattern and type of acoustical panel, ceiling suspension system and trim required for Project - minimum one complete factory-sealed package of each.

1.10 Quality assurance

1. Certifications:
 - 1.1. Fire-Resistance Rated Suspension System: Certified by a Canadian Certification Organization accredited by the Standards Council of Canada.
 - 1.2. Submit manufacturer's product certificates, certifying materials comply with specified performance criteria and physical requirements. Include certification of sustainable requirements.
2. Manufacturers: Obtain materials for each type of acoustical panel ceiling system (panels and suspension system) from a single manufacturer. Provide products exposed to view from the same production run for each room, with consistent appearance.
3. Mock-Ups: Construct a mock-up in accordance with Section 01 43 00 - Quality Assurance.
 - 3.1. Construct mock-up a minimum 10 m² of each type of acoustical ceiling assembly including one inside corner and one outside corner. Ceiling system mock-up to show basic construction and assembly, treatment at walls, splicing, interlocking, finishes, acoustical unit installation, seismic reinforcing, one recessed light fixture, and one sprinkler head..
 - 3.2. Construct mock-up at Project site where jointly agreed between Contractor and Consultant.
 - 3.3. Consultant will require a minimum 48 hours to review the mock-up.
 - 3.4. Mock-up may not remain as part of the finished work.

1.11 Delivery, storage, and handling

1. Perform in accordance with Section 01 61 00 - Common Product Requirements.
2. Storage and Handling Requirements:
 - 2.1. Store materials flat, off ground, indoors, and in a clean, dry, and well-ventilated area.
 - 2.2. Protect acoustical ceiling components from nicks, scratches, and other damage.

1.12 Ambient conditions

1. Unless manufacturer's recommendations are more restrictive, maintain uniform temperature of 15 to 29 degrees C and relative humidity of 20 to 40% for 48 hours before and during installation.
2. Store materials in work area 48 hours before beginning installation.

1.13 Warranty

1. Manufacturer Warranty:
 - 1.1. Coverage of manufacturing defects in materials and workmanship resulting in failure of suspension system for 15 years from date of Substantial Performance.

Part 2 Products

2.1 Regulatory requirements

1. Fire-Resistance Rated Acoustic Panel Ceilings: Meeting requirements of CAN/ULC-S102, labelled and listed by ULC Standards, Warnock Hersey Intertek (WHI), or another testing and inspecting agency acceptable to authorities having jurisdiction (AHJ).

2.2 Design criteria

1. Superimposed Loads: Determine superimposed loads applied to ceiling suspension systems by components of the building and verify that adequate hangers are installed to support additional loads in conjunction with normal loads of the ceiling system, and as follows:

- 1.1. Maximum Deflection: Limit deflection to L/360 in accordance with ASTM C635/C635M deflection test.
- 1.2. Seismic Restraints: Design system to withstand seismic forces in accordance with CSA S832 and as outlined in applicable Building Code for post-disaster Importance Category facilities based on a full uniform ceiling load acceleration in accordance with ASTM A580/A580M. Ceiling areas less than 13.4 m² and surrounded by walls connected to structure above do not require seismic restraints.

2.3 Acoustical ceiling panels

1. Certainteed, Baroque, BET-197
1.1. 2'x4'x5/8", white

2.4 Acoustical ceiling suspension

1. 15/16" EZ Stab All-Aluminum Cleanroom System
2. Physical Characteristics
 - 2.1. Structural Classification: Light Duty per ASTM C635
 - 2.2. Double web design manufactured of all aluminum
 - 2.3. Cross tees feature EZ Clip – reduced insertion force, easy removability
 - 2.4. Patented Latitude Holes spaced every 3" and in bulb of tee
 - 2.4.1. Latitude Holes can be used for hanger wires in intermediate duty, non-seismic installations only
 - 2.5. Main runners and cross tees feature double-web stitching to increase torsional rigidity, reduced grid rotation or bending
 - 2.6. Gasketing on main runners, cross tees, and wall angle to satisfy FGI Healthcare Guidelines for ceiling systems utilizing panels weighing less than one pound per square foot
 - 2.7. Tee height: 1-1/2"
 - 2.8. Flange Size: 15/16"
 - 2.9. Standard Color: White
 - 2.10. Components
 - 2.10.1. Main Runners , Size: 12'
 - 2.10.2. Cross Tees, Size: 2'
 - 2.10.3. Edge Molding
 - 2.10.3.1. Type: angle
Profile: 90° L-angle
Size: 144"
 - 2.11. Attachment Devices: Anchors sufficient for five-times design load indicated in ASTM C635 (Table 1). Wire for hangers of size and type to suit intended application, complying with ASTM A641, Class 1 zinc coating, not less than 12 gauge
 - 2.11.1. Seismic Restraints: Pursuant to ASTM E580 and local code requirements
3. Hanger Wire: To ASTM A641/A641M, galvanized soft annealed steel wire:
 - 3.1. Access Panel Ceilings: Minimum 3.6-mm diameter
 - 3.2. Fire-Rated Assemblies: To ULC design requirements, to seismic Design Category for seismic assemblies.
 - 3.3. Other Ceilings: Minimum 2.6-mm diameter

4. Hanger Inserts: Purpose made.
5. Accessories: Splices, clips, wire ties, retainers and wall moulding flush to complement suspension system components, and as recommended by system manufacturer.
6. Seismic Components and Accessories: In accordance with reviewed shop drawings.

Part 3 Execution

3.1 Examination

1. Verify substrate conditions are acceptable for installation of acoustical ceiling panel and suspension system in accordance with manufacturer's instructions.
 - 1.1. Visually inspect substrates in presence of [Departmental Representative][DCC Representative][Consultant].
 - 1.2. Inform Consultant of unacceptable conditions immediately upon discovery.
 - 1.3. Proceed with installation after unacceptable conditions are remedied and after receipt of written approval to proceed from [Departmental Representative][DCC Representative][Consultant].

3.2 Installation - suspension system

1. Comply with manufacturer's installation instructions and recommendations, including product technical bulletins, installation instructions, and data sheets.
2. Install suspension system in accordance with accepted shop drawings, Certification Organizations tested design requirements and ASTM C636/C636M except where specified otherwise.
3. Install suspension system by suspending ceiling hangers from building's structural members, and as follows:
 - 3.1. Install hangers plumb and free from contact with insulation or other objects within ceiling plenum that are not part of supporting structure or of ceiling suspension system.
 - 3.2. Attach hangers to structural members or intermediate structural supports.
 - 3.3. Fasten hangers to cast-in-place hanger inserts, powder actuated fasteners, or drilled in anchors that extend through forms into concrete.
 - 3.4. Splay hangers only where required to miss obstructions. Offset resulting horizontal forces by bracing or counter-splaying.
4. Lay out system according to reflected ceiling plan.
5. Installation Tolerances: Finished ceiling system square with adjacent walls and level within 1:1000.
6. Secure hangers to overhead structure using attachment methods as indicated.
7. Install hangers spaced at a maximum 1200 mm on centre and within 150 mm from ends of main tees.
8. Coordinate suspension system with location of related components. Provide carrying channels as necessary to bridge at unavoidable interference between suspension system and other work above ceiling.
9. Install wall moulding to provide correct ceiling height.
10. Completed suspension system to support super-imposed loads, such as lighting fixtures , diffusers , grilles.
11. Support light fixtures and diffusers with additional ceiling suspension hangers within 150 mm of each corner and at a maximum 610 mm around perimeter of fixture.
12. Interlock or attach cross member to main runner to provide rigid assembly.
13. Frame at openings for light fixtures, air diffusers, speakers, and at changes in ceiling heights.
14. Expansion Joints:

- 14.1. Erect two parallel main runners, 25 mm apart, on building expansion joint line. Lay in strip of acoustic panel/board, painted black, 25% narrower than space between two 'T' bars.
- 14.2. Provide Z-shaped metal trim pieces at each side of expansion joint. Design to accommodate plus or minus 25-mm movement and maintain visual closure. Finish metal components to match adjacent exposed metal trim. Provide backing plates behind butt joints.
15. Install perimeter trim at floating installations securely anchored to suspension system, in accurate alignment with adjacent assemblies. Install curved trim members in smooth curves to radius indicated.

3.3 Installation - acoustical ceiling panel system

1. Install lay-in acoustical panels in ceiling suspension system in accordance with manufacturer's instructions and as indicated.
2. Install panels with edges fully hidden from view by flanges of suspension system runners and mouldings.
3. Install fibrous acoustical media and spacers over entire area above suspended metal panels.
4. In fire-rated ceiling systems, secure lay-in panels with hold-down clips and protect over light fixtures, diffusers, air return grilles and other appurtenances according to Certification Organizations design requirements.

3.4 Site quality control

1. Site Tests and Inspections: Arrange for periodic site visits by design professional responsible for delegated ceiling design work to review installed work for conformity to design.
2. Manufacturer Services: Arrange for periodic site visits by manufacturer's representative to review installed work for conformity to manufacturer's installation instructions and recommendations.
 - 2.1. Submit written site reports within three days of visit.
3. Non-Conforming Work:
 - 3.1. Do not support ceilings directly from permanent metal forms, floor deck, or other non-structural framing.
 - 3.2. Do not attach hangers to steel roof deck or steel deck tabs.
 - 3.3. Do not level ceilings by putting kinks in suspension wires. Kinks in suspension wires are not acceptable.
 - 3.4. Conceal fasteners including pop rivets on mouldings and trims.

3.5 Cleaning

1. Progress Cleaning: In accordance with Section 01 74 00 - Cleaning.
2. Final Cleaning: In accordance with Section 01 74 00 – Cleaning, and touch-up scratches, abrasions, voids, and other defects in painted surfaces.

3.6 Protection

1. Protect installed products from damage during construction.
2. Repair damage to adjacent materials caused by acoustical suspension installation.

End of Section

Section 09 65 16

Resilient Sheet Flooring

Part 1 General

1.1 Summary

1. Section Includes:
 - 1.1. resilient sheet flooring
 - 1.2. flash cove bases

1.2 Related requirements

1. Section 02 41 19.16 – Selective Interior Demolition

1.3 Reference standards

1. American Association of Textile Chemists and Colorists (AATCC):
 - 1.1. AATCC 134-2019, Test Method for Electrostatic Propensity of Carpets
2. ASTM International (ASTM):
 - 2.1. ASTM D2047-17, Standard Test Method for Static Coefficient of Friction of Polish-Coated Flooring Surfaces as Measured by the James Machine
 - 2.2. ASTM E96/E96M-16, Standard Test Methods for Water Vapor Transmission of Materials
 - 2.3. ASTM F150-06, Standard Test Method for Electrical Resistance of Conductive and Static Dissipative Resilient Flooring
 - 2.4. ASTM F710-22, Standard Practice for Preparing Concrete Floors to Receive Resilient Flooring
 - 2.5. ASTM F1303-04, Standard Specification for Sheet Vinyl Floor Covering with Backing
 - 2.6. ASTM F1482-21, Standard Practice for Installation and Preparation of Panel Type Underlayments to Receive Resilient Flooring
 - 2.7. ASTM F1859-21a, Standard Specification for Rubber Sheet Floor Covering Without Backing
 - 2.8. ASTM F1860-21a, Standard Specification for Rubber Sheet Floor Covering With Backing
 - 2.9. ASTM F1861-21, Standard Specification for Resilient Wall Base
 - 2.10. ASTM F1869-22, Standard Test Method for Measuring Moisture Vapor Emission Rate of Concrete Subfloor Using Anhydrous Calcium Chloride
 - 2.11. ASTM F1913-19, Standard Specification for Vinyl Sheet Floor Covering Without Backing
 - 2.12. ASTM F2034-18, Standard Specification for Sheet Linoleum Floor Covering
 - 2.13. ASTM F2169-15, Standard Specification for Resilient Stair Treads
 - 2.14. ASTM F2170-19a, Standard Test Method for Determining Relative Humidity in Concrete Floor Slabs Using in situ Probes
 - 2.15. ASTM F3010-18, Standard Practice for Two-Component Resin Based Membrane-Forming Moisture Mitigation Systems for Use Under Resilient Floor Coverings
 - 2.16. ASTM F3041-14, Standard Specification for Bonded Rubber Crumb Floor Coverings
3. CSA Group (CSA):
 - 3.1. CSA B651-18, Accessible design for the built environment
 - 3.2. CSA Z8000, Canadian Health Care Facilities – Planning, Design and Construction

4. EOS/ESD Association (ESD):
 - 4.1. ANSI/ESD STM7.1-20, For the Protection of Electrostatic Discharge Susceptible Items - Flooring Systems Resistive Characterization
5. General Services Administration, Federal Test Standard (FTS):
 - 5.1. FTS 101C, Method 4046, Electrostatic Properties of Materials
6. National Floor Covering Association of Canada (NFCA):
 - 6.1. NFCA Floor Covering Reference Manual
7. National Floor Safety Institute (NFSI):
 - 7.1. ANSI/NFSI B101.1-2022, Test Method for Measuring the Wet SCOF of Hard-Surface Walkways
 - 7.2. ANSI/NFSI B101.3-2022, Test Method for Measuring the Wet DCOF of Hard Surface Walkways
8. ULC Standards (ULC):
 - 8.1. CAN/ULC-S102.2:2018, Test for Surface Burning Characteristics of Flooring, Floor Coverings, and Miscellaneous Materials and Assemblies

1.4 Administrative requirements

1. Coordination:
 - 1.1. Upon request, Consultant will provide a digital drawing file of the floor finish plan illustrating complex patterns
2. Pre-Installation Meeting:
 - 2.1. Conduct a site meeting in accordance with Section 01 31 19 – Project Meetings, attended by Consultant, and related Subcontractors to:
 - 2.1.1. verify project requirements,
 - 2.1.2. review delivery, storage, and handling requirements,
 - 2.1.3. review installation and substrate conditions,
 - 2.1.4. confirm complex flooring patterns,
 - 2.1.5. coordinate with other Subcontractors,
 - 2.1.5.1. coordinate connection of copper grounding strips with electrical installers,
 - 2.1.6. review manufacturer's instructions and warranty requirements, and
 - 2.1.7. review NFCA Quality Assurance Program (QAP) inspection procedures and reporting , including timing of reports for multi-phase projects.

1.5 Action and informational submittals

1. Submit in accordance with Section 01 33 00 - Submittal Procedures.
2. Submit the following action submittals before starting work of this Section:
 - 2.1. Product Data: Product literature and data sheets, including product characteristics, performance criteria, physical sizes, finishes, and limitations.
 - 2.2. Shop Drawings: Show layout and locations of seams, edges, doorways, built-in furniture, and cut-outs.
 - 2.3. Verification Samples: To verify specified colours, patterns, textures, profiles, and finishes.
 - 2.3.1. 300 mm x 300 mm sample of each type of resilient sheet flooring.
 - 2.3.2. 300 mm long sections of each type of edge strip and transition strip.
 - 2.4. Site Quality Control Submittals: In accordance with NFCA QAP procedures and requirements.

- 2.4.1. Submit floor pre-installation test results prior to beginning flooring installation. Compare tested moisture vapour emission rates and alkalinity with manufacturer's requirements for each flooring type.
 - 2.4.2. Submit manufacturer's recommended corrective actions when pre-installation test results deviate from manufacturer's installation requirements.
 3. Submit the following informational submittals as work progresses:
 - 3.1. Manufacturer's Instructions: Indicate special storage and handling requirements, installation instructions and sequence, and cleaning procedures. Keep a copy on site during installation.
 - 3.2. Manufacturer's Site Reports: Manufacturer's reports confirming work of this Section complies with manufacturer's requirements for handling installation protection and cleaning, as specified in SITE QUALITY CONTROL in this Section. Submit within 5 working days of site visit.
 - 3.3. Sustainable Design Submittals: Information demonstrating sustainability characteristics specified in this Section and in accordance with Section 01 35 21 - LEED Requirements.
 - 3.3.1. Environmental Product Declarations (EPDs): Industry-wide EPD for each product, with at least cradle-to-gate scope, identifying these impact categories:
 - 3.3.1.1. Global Warming Potential (GWP): Submit GWP information in the form of kg CO₂-eq.
 - 3.3.1.2. Ozone Depletion Potential (ODP): Submit ODP information in the form of kg CFC 11-eq.
 - 3.3.1.3. Acidification Potential (AP): Submit AP information in the form of kg SO₂-eq.
 - 3.3.1.4. Eutrophication Potential (EP): Submit EP information in the form of kg N-eq.
 - 3.3.1.5. Smog Formation Potential (SFP): Submit SFP information in the form of kg O₃-eq. Also referred to as "photochemical ozone creation potential" (POCP).
 - 3.3.2. Recycled Content: Submit 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 the Project.
 - 3.3.3. Low Emitting Materials: Manufacturer's information indicating VOC emission limit in g/L.

1.6 Closeout submittals

1. Submit in accordance with Section 01 78 00 – Closeout Submittals.
2. Operation and Maintenance Data: Include the following in the operation and maintenance manual:
 - 2.1. Manufacturer's maintenance instructions.
 - 2.2. Recommended cleaning materials and methods.
3. Bonds: Two-year maintenance bond for 100% value of work of this Section.
4. Warranty Documentation: Submit manufacturer's warranties.

1.7 Maintenance material submittals

1. Extra Stock Materials: In accordance with Section 01 78 00 - Closeout Submittals.
2. Supply a minimum 2% of each colour, pattern, texture, and type of resilient sheet flooring material in full roll width. Also supply sheet flooring off-cuts where size is 450 mm x 450 mm or larger.
 - 2.1. Label each roll of sheet flooring matching designations indicated on Drawings.

1.8 Quality assurance

1. Perform work of this Section in accordance with NFCA QAP requirements.

2. Qualifications:

- 2.1. Installers: Experienced in resilient sheet flooring , welding bead seaming , integral cove base installations with three years documented successful installations , with manufacturer's training or certification program.
- 2.2. Third-Party Independent Inspector: NFCA Accredited QAP provider, or otherwise appointed by NFCA.

1.9 Delivery, storage, and handling

- 1. Perform in accordance with Section 01 61 00 - Common Product Requirements.
 - 1.1. Protect adhesives, fillers, and sealants from freezing.

1.10 Site conditions

- 1. Ambient Conditions: Maintain specified ambient conditions, or more stringent manufacturer requirements, for 72 hours before installation, continuously during installation, and 72 hours after installation.
 - 1.1. Ambient room temperature: 18°C to 29°C.
 - 1.2. Floor substrate temperature: Minimum 15°C.
 - 1.3. Relative humidity: 40% to 60%
- 2. Extra Ventilation: Provide high ventilation rate, maximizing outside air, during installation, and for 48 to 72 hours after installation. If possible, vent directly to outside. Prevent contaminated air recirculation through interior air distribution system. Maintain extra ventilation for at least one month following building occupancy.

1.11 Warranty

- 1. Manufacturer Warranty: 20-year commercial warranty.

Part 2 Products

2.1 Regulatory requirements

- 1. Comply with CAN/ULC-S102.2 for required flame-spread ratings labelled and listed by ULC Standards or another agency acceptable to the authority having jurisdiction.

2.2 Resilient sheet flooring materials

- 1. Tarkett iQ Granit - Granit WHITE BEIGE 0325, Ref. 21142325
- 2. Welding Rod: Tarkett, Unicolored light beige 0773

2.3 Cove base

- 1. Tarkett iQ Granit - Granit WHITE BEIGE 0325, Ref. 21142325
- 2. Welding Rod: Tarkett, Unicolored light beige 0773
- 3. Internal clean room corner : Tarkett Ref. 26623007

2.4 Accessories

- 1. Subfloor Filler and Leveller: Two-part latex-type filler requiring no water, as recommended by resilient sheet flooring manufacturer.
- 2. Primer: As recommended by resilient sheet flooring manufacturer for site conditions and application.

3. Adhesives:
 - 3.1. Flooring Adhesives: As recommended by resilient sheet flooring manufacturer for site conditions and application.
 - 3.2. Static Conductive Flooring Adhesive: Full spread adhesive, specially formulated for static conductive flooring, and as recommended by sheet flooring manufacturer for application.
 - 3.3. Cove Base Adhesives: As recommended by resilient sheet flooring manufacturer for site conditions and application.
 - 3.4. Resilient Base Adhesives: As recommended by resilient base manufacturer for site conditions and application.
4. Heat Welding Bead: Solid strand product recommended by resilient sheet flooring manufacturer for heat welding seams.
 - 4.1. Colour and Pattern: As selected by Consultant.
5. Chemical Bonding Compound: Type recommended by sheet flooring manufacturer for chemically bonding seams.
6. Edging at Floor Penetrations: Aluminum, type recommended by flooring manufacturer.
7. Flash Cove Base Filler Strip: Pre-formed 45 mm radius to support flash cove base, PVC.
8. Flash Cove Base Cap: Aluminum, rounded top profile, 2.0 mm thick.
9. Sealer and Wax: If recommended by sheet flooring manufacturer, type recommended by manufacturer.

Part 3 Execution

3.1 Examination

1. Verify conditions in accordance with Section 01 71 00 – Examination and Preparation, and:
 - 1.1. verify substrates are clean, and free of cracks, ridges, depressions, scale, and foreign materials;
 - 1.2. verify subfloor is free of squeaks when walking across floor; and
 - 1.3. verify painting and ceiling work is complete.
2. Pre-Installation Testing:
 - 2.1. Test to verify concrete floors are dry, with low moisture vapour emission rates and acceptable alkalinity. Test to ASTM F2170 or ASTM F1869, or more stringently as recommended or required by the resilient sheet flooring manufacturer. Notify the Consultant at least five days before testing.

3.2 Preparation

1. Demolition: Remove existing flooring materials in accordance with Section [02 41 19 – Selective Demolition][02 41 19.16 – Selective Interior Demolition][02 42 19.48 – Carpeting Recycling].
2. Prepare concrete floor substrates in accordance with ASTM F710.
 - 2.1. Prepare concrete floor substrates exceeding manufacturer's vapour emission recommendations in accordance with ASTM F3010.
3. Prepare wood subfloors in accordance with ASTM F1482.
4. Clean floor of dust, mould, mildew, alkaline salts, laitance, concrete film-forming curing compounds, paint, solvents, wax, oil, grease, residual adhesive, adhesive removing compounds, sealants, soap, and other foreign material.
5. Fill low spots, cracks, joints, holes, and other defects with subfloor filler. Trowel and float to leave smooth, flat hard surface. Prohibit traffic until filler is dry and cured.
6. Prime to resilient flooring manufacturer's recommendations.

7. Do not use permanent markers on floor substrates.
8. Apply copper grounding strips to substrate and connect to pre-determined grounding point. Coordinate connection with Consultant and electrical Subcontractors.

3.3 Resilient sheet flooring installation

1. Apply adhesive uniformly using manufacturer's recommended trowel, followed by a roller or similar tool to knock down trowel ridges and eliminate them from telegraphing through finished flooring. Avoid spreading more adhesive than can be covered by resilient sheet flooring before initial adhesive sets. Applying adhesive only at perimeter is not acceptable.
2. Lay with seams in direction of traffic to minimize number of seams.
2.1. Border Widths: Minimum 1/3 of full material width.
3. Double cut sheet joints and continuously heat weld according to manufacturer's instructions.
4. Do not install over building expansion joints.
5. Roll resilient sheet flooring, as installation progresses and after installation, to remove air bubbles and promote full adhesion. Use a minimum 45 kg roller, or other weight in accordance with manufacturer's instructions.
6. Promptly remove excess adhesive.
7. Cut flooring neatly around fixed objects.
8. When made necessary by material width or roll length, locate cross-seams and seams at doors and pivot points in accordance with reviewed shop drawings.
9. Install pan-type floor access covers. Maintain continuity of floor pattern.
10. Install continuously through areas to receive built-in furniture.
11. Install into floor drain clamping rings, and down into trench drains, where applicable. Cutting and caulking of such flooring flush with floor drain grate or trim is not acceptable and flooring will be rejected.
12. Terminate flooring under centre line of door in openings where adjacent floor finish materials or colours are dissimilar.
13. Install metal edge strips at unprotected and exposed edges where sheet flooring terminates.

3.4 Flash cove base installation

1. Install flash cove bases where indicated on Drawings.
2. Back floor and wall junction with flash cove base filler strip.
3. Turn up resilient sheet flooring to form base to indicated height.
4. Install flash cove base cap to terminate base. Install level, straight and aligned with adjacent pieces.
5. Inside Corners: Remove excess material to achieve neat fit seam; heat weld seams.
6. Outside Corners: Form corner with a butterfly piece; heat weld seams.

3.5 Site quality control

1. Site Inspections:
 - 1.1. Third-party independent inspection agency: Provide services of a NFCA-accredited third-party independent inspection agency to conduct random inspections and issue reports during resilient sheet flooring installation. Inspections and reports in accordance with NFCA QAP - Part A04.
2. Manufacturer Services: Provide manufacturer's site services consisting of product use recommendations and periodic site visits for inspection of product installation in accordance with manufacturer's instructions and warranty requirements.

2.1. Schedule site visits to review work of this Section:

- 2.1.1. After delivery and storage of products, and when preparatory Work is complete, but before installation begins.
- 2.1.2. During mock-up construction.
- 2.1.3. During progress of Work at approximately 30% and 60% complete.
- 2.1.4. Upon completion of the work of this Section.

3.6 Protection

- 1. Prohibit traffic on resilient sheet flooring for a minimum 48 hours after installation.
- 2. Protect resilient sheet flooring until Substantial Performance of the Work.
- 3. Protect floors under heavy traffic, rolling loads, or pallet jacks with minimum 6 mm thick temporary hardboard panels. Sweep or vacuum resilient sheet flooring before installing panels.

End of Section

Section 09 72 16

Vinyl-Coated Fabric Wall Coverings

Part 1 General

1.1 Related requirements

1. Section 09 21 16 – Gypsum Board Assemblies

1.2 Reference standards

1. ASTM International (ASTM):
 - 1.1. ASTM F793/F793M-20, Standard Classification of Wall Coverings by Use Characteristics
2. General Services Administration (GSA) Federal Specification:
 - 2.1. CCC-W-408D current edition, Wall Covering, Vinyl-Coated
3. Gypsum Association (GA):
 - 3.1. GA-214-2021, Levels of Finish for Gypsum Panel Products
4. Health Canada/Workplace Hazardous Materials Information System (WHMIS):
 - 4.1. Safety Data Sheets (SDS)
5. NSF International/American National Standards Institute (NSF/ANSI):
 - 5.1. NSF/ANSI 342-2019, Sustainability Assessment to Wallcovering Products
6. South Coast Air Quality Management District (SCAQMD):
 - 6.1. SCAQMD Rule 1168-A 2017, Adhesives and Sealant Applications
7. ULC Standards (ULC):
 - 7.1. CAN/ULC-S102.2-18, Standard Method of Test for Surface Burning Characteristics of Flooring, Floor Coverings, and Miscellaneous Materials and Assemblies
8. Canadian Standards Association (CSA)
 - 8.1. CSA Z8000, Canadian Health Care Facilities – Planning, Design and Construction
9. Wallcovering Association (WA):
 - 9.1. W-101-17, WA Quality Standard for Polymer Coated Fabric Wallcovering
 - 9.2. W-102-19, WA Quality Standard for Wallcovering - Alternative Constructions

1.3 Administrative requirements

1. Coordination:
 - 1.1. Coordinate substrate preparation requirements with Section 09 21 16 – Gypsum Board Assemblies.
 - 1.2. Coordinate work that penetrates wall coverings with other Subcontractors.
2. Sequencing: Install wall coverings after other Subcontractors work that penetrates wall substrates is complete.

1.4 Action and informational submittals

1. Submit in accordance with Section 01 33 00 - Submittal Procedures.
2. Submit WHMIS SDS for wall coverings and adhesives.

3. Submit manufacturer's technical data for wall coverings and adhesives including product description, total fabric weight, type of fabric backing, permeability, flame-spread rating, smoke developed classification, tensile strength, and tear strength.
4. Submit manufacturer's installation recommendations.
5. Samples for Initial Selection: Submit minimum 280 x 215-mm samples of wall covering for Consultant's selection.
6. Samples for Verification: Submit duplicate 280 x 215-mm samples of each wall covering illustrating range of colours, patterns, and textures.

1.5 Closeout submittals

1. Submit in accordance with Section 01 78 00 - Closeout Submittals, and as follows:
 - 1.1. Submit manufacturer's cleaning and maintenance recommendations for wall coverings.
 - 1.2. Submit manufacturer's warranty.
 - 1.3. Submit manufacturer's guidelines for disinfecting wall coverings.

1.6 Quality assurance

1. Site Sample:
 - 1.1. Before beginning installation, prepare a portion of wall substrate and install two full width wall covering panels of each specified type from the same production run as materials proposed for this Project. Site sample will be reviewed for roller marks and other manufacturing imperfections for Consultant's acceptance.
2. Construct mock-up in accordance with Section 01 43 00 - Quality Assurance, and as follows:
 - 2.1. Install each specified type of wall covering to an 8 m² area of surface. Three full wall panels, full height of wall/partition.
 - 2.2. The Consultant will require a minimum of two Working Days to review the mock-up.
 - 2.3. Mock-up may not remain as part of finished work.

1.7 Delivery, storage, and handling

1. Perform in accordance with Section 01 61 00 - Common Product Requirements.
 - 1.1. Protect primer and adhesive from freezing.

1.8 Ambient conditions

1. Temperature: Maintain air temperature and structural base temperature at wall covering installation area above 20°C and maintain relative humidity below 40% for 72 hours before, during, and 72 hours after installation.
2. Ventilation: Ventilate enclosed spaces in accordance with Section 01 51 00 - Temporary Utilities.
 - 2.1. Ventilate continuously during installation and for 72 hours after.

1.9 Maintenance material submittals

1. Extra Stock Materials: Supply in accordance with Section 01 78 00 - Closeout Submittals.
 - 1.1. Supply extra materials of wall coverings from the same production run as installed wall coverings, adhesives.
 - 1.2. Supply sufficient adhesive to install extra stock material wall covering.

1.10 Warranty

1. Manufacturer Warranty: Wall coverings with lifetime year warranty for manufacturing material defects.

Part 2 Products

2.1 Regulatory requirements

1. Characteristics of wall coverings in accordance with CAN/ULC-S102.2:
 - 1.1. Flame-Spread Rating: 10
 - 1.2. Smoke Developed Classification: Maximum 45

2.2 WP1 - Rigid Wall Covering

1. Rigid sheet should be high impact Acrovyn with nominal .060" (1.52mm) thickness. Supplied in 4' x 8' or 10' (1.22m x 2.44m or 3.05m) sheet sizes in Suede (standard), Color-matched caulk and vinyl/acrylic trim as needed for joints/transitions.
 - 1.1. Color: 848 Aspen
2. Accessories
 - 2.1. Engineered PVC-Free Corner Guards to be Acrovyn 4000 by Construction Specialties: Surface mounted guards consisting of continuous retainer with snap-on Acrovyn 4000 cover. Color matched end caps to be provided for both partial and full height applications. Attachment hardware shall be appropriate for wall construction.
 - 2.1.1. Model SSM-20N 90° surface mounted corner guard with 2" (51mm) legs, ¼" radiused cover and recycled PVC-Free retainer. Select from one of Acrovyn solid colors, Acrovyn Woodgrains or Acrovyn Brushed Metals simulated patterns.

Part 3 Execution

3.1 Examination

1. Verify substrates are clean, dry, free of dust, oils, cracks, and surface irregularities.
 - 1.1. Test substrates do not exceed 6% moisture content.
 - 1.2. Examine gypsum board substrates for visible mould growth. Do not proceed with work of this Section until mould is remedied.
2. Verify other work penetrating wall substrates is installed and complete.
3. Verify gypsum board substrates are prepared to GA-214 Level 3.
4. Check previously painted substrates for pigment bleeding. Using fine sandpaper, lightly sand painted surfaces with gloss, semi-gloss, or eggshell finishes.

3.2 Preparation

1. Unwrap wall coverings indoors when temperature and ventilation conditions are operating normally for the area's intended use. Allow a minimum of 24 hours to acclimate wall coverings before beginning installation.
2. Prepare surfaces according to wall covering manufacturer's instructions.
3. Temporarily remove electrical cover plates, surface-mounted hardware, related fittings and fastenings.
4. Prime paint or seal substrates to receive wall covering as recommended by manufacturer.

3.3 Installation

1. Install the work of this section in strict accordance with the manufacturer's recommendations, using approved adhesive.
2. Temperature at the time of installation must be between 65-75°F (18-24°C) and be maintained for at least 48 hours after the installation to allow for proper adhesive set up.
3. Relative humidity shall not exceed 80%.
4. Do not expose wall covering to direct sunlight during or after installation. This will cause the surface temperature to rise, which in turn will cause bubbles and delamination.

3.4 Cleaning

1. Perform in accordance with Section 01 74 00 - Cleaning, and as follows:
 - 1.1. Where soiling or excess adhesive occurs, clean surfaces following manufacturer's instructions and recommendations.

3.5 Protection

1. Protect finished surfaces and exterior corners from damage until final site review.

End of Section

Section 09 91 23

Interior Painting

Part 1 General

1.1 Reference standards

1. Environmental Protection Agency (EPA)
 - 1.1. Test Method for Measuring Total Volatile Organic Compound Content of Consumer Products, EPA Method 24 - Surface Coatings.
 - 1.2. SW-846, Test Methods for Evaluating Solid Waste: Physical/Chemical Methods.
2. Health Canada/Workplace Hazardous Materials Information System (WHMIS)
 - 2.1. Safety Data Sheets (SDS).
3. Master Painters Institute (MPI)
 - 3.1. The Master Painters Institute (MPI)/Architectural Painting Specification Manual (ASM)-current edition.
 - 3.2. Standard GPS-1-12, MPI Green Performance Standard.
 - 3.3. Standard GPS-2-12, MPI Green Performance Standard.
4. Canadian Standards Association (CSA)
 - 4.1. CSA Z8000, Canadian Health Care Facilities – Planning, Design and Construction
5. National Research Council Canada (NRC)
 - 5.1. National Fire Code of Canada 2015 (NFC).
6. Society for Protective Coatings (SSPC)
 - 6.1. SSPC Painting Manual, Volume Two, 8th Edition, Systems and Specifications Manual.

1.2 Administrative requirements

1. Scheduling:
 - 1.1. Submit work schedule for various stages of painting to Consultant for review. Provide schedule minimum of 48 hours in advance of proposed operations.
 - 1.2. Obtain written authorization from Consultant for changes in work schedule.
 - 1.3. Schedule new additions to existing building coordinate painting operations with other trades.

1.3 Action and informational submittals

1. Provide in accordance with Section 01 33 00 - Submittal Procedures.
2. Product Data:
 - 2.1. Provide manufacturer's instructions, printed product literature and data sheets for paint and paint products and include product characteristics, performance criteria, physical size, finish and limitations.
 - 2.2. Submit 2 copies of WHMIS SDS in accordance with Section 01 35 29 - Health, Safety, and Emergency Response Procedures.
 - 2.3. Confirm products to be used are in MPI's approved product list.
3. Upon completion, provide records of products used. List products in relation to finish system and include the following:

- 3.1. Product name, type and use.
- 3.2. Manufacturer's product number.
- 3.3. Colour number s.
- 3.4. MPI Environmentally Friendly classification system rating.
- 3.5. Manufacturer's Safety Data Sheets (SDS).
4. Samples:
 - 4.1. Submit full range colour sample chips to indicate where colour availability is restricted.
 - 4.2. Submit 200 x 300 mm sample panels of each paint with specified paint or coating in colours, gloss/sheen and textures required to MPI Architectural Painting Specification Manual standards submitted on following substrate materials:
 - 4.2.1. 3 mm for finishes over metal surfaces.
 - 4.2.2. 13 mm for finishes over gypsum board and other smooth surfaces.
 - 4.3. Retain reviewed samples on-site to demonstrate acceptable standard of quality for appropriate on-site surface.
5. Test reports: Provide certified test reports for paint from approved independent testing laboratories, indicating compliance with specifications for specified performance characteristics and physical properties.
 - 5.1. Lead, cadmium and chromium: presence of and amounts.
 - 5.2. Mercury: presence of and amounts.
 - 5.3. Organochlorines and PCBs: presence of and amounts.
6. Certificates: Provide certificates signed by manufacturer certifying that materials comply with specified performance characteristics and physical properties. MPI Gateway #.
7. Manufacturer's Instructions:
 - 7.1. Provide manufacturer's installation and application instructions.
8. Sustainable Design Submittals:
 - 8.1. LEED submittals: in accordance with Section 01 35 21 - LEED Requirements.
 - 8.2. Construction Waste Management:
 - 8.2.1. Provide project Waste Management Plan highlighting recycling and salvage requirements.
 - 8.2.2. Provide calculations on end-of-project recycling rates, salvage rates, and landfill rates demonstrating that 50% of construction wastes were recycled or salvaged.
 - 8.3. Recycled Content:
 - 8.3.1. Submit listing of recycled content products used, including details of required percentages or recycled content materials and products, showing their costs and percentages of post-consumer and post-industrial content, and total cost of materials for project.
 - 8.4. Low-Emitting Materials:
 - 8.4.1. Provide listing of paints and coatings and adhesives and sealants used in building, showing compliance with VOC and chemical component limits or restriction requirements.

1.4 Closeout submittals

1. Provide in accordance with Section 01 78 00 - Closeout Submittals.
2. Operation and Maintenance Data: Provide operation and maintenance data for painting materials for incorporation into manual.

3. Include:
 - 3.1. Product name, type and use.
 - 3.2. Manufacturer's product number.
 - 3.3. Colour number s.
 - 3.4. MPI Environmentally Friendly classification system rating.

1.5 Maintenance material submittals

1. Extra Stock Materials:
 - 1.1. Provide maintenance materials in accordance with Section 01 78 00 - Closeout Submittals.
 - 1.2. Submit 1 litre can of each type and colour of primer. Identify colour and paint type in relation to established colour schedule and finish system.

1.6 Quality assurance

1. Qualifications:
 - 1.1. Contractor: to have a minimum of 5 years proven satisfactory experience. When requested, provide list of last 3 comparable jobs including, job name and location, specifying authority, and project manager.
 - 1.2. Qualified journeypersons as defined by local jurisdiction to be engaged in painting work.
 - 1.3. Apprentices: may be employed provided they work under direct supervision of qualified journeyperson in accordance with trade regulations.
 - 1.4. Conform to latest MPI requirements for exterior painting work including preparation and priming.
 - 1.5. Materials: in accordance with MPI Painting Specification Manual "Approved Product" listing and from a single manufacturer for each system used.
 - 1.6. Retain purchase orders, invoices and documents to prove conformance with noted MPI requirements when requested by Consultant.
 - 1.7. Standard of Acceptance:
 - 1.7.1. Walls: no defects visible from a distance of 1000 mm at 90 degrees to surface.
 - 1.7.2. Soffits: no defects visible from floor at 45 degrees to surface when viewed using final lighting source.
 - 1.7.3. Final coat to exhibit uniformity of colour and uniformity of sheen across full surface area.
2. Mock-Ups:
 - 2.1. When requested by Consultant or Paint Inspection Agency, prepare and paint designated surface, area, room or item to requirements specified herein, with specified paint or coating showing selected colours, number of coats, gloss/sheen, textures and quality of work to MPI Painting Specification Manual standards for review and approval.
 - 2.2. Construct mock-ups in accordance with Section 01 43 00 - Quality Assurance.
 - 2.2.1. Provide 1000 mm x 1000 mm mock-up. Prepare and paint designated surface, area, room or item (in each colour scheme) to specified requirements, with specified paint or coating showing selected colours, gloss/sheen, textures.
 - 2.2.2. Mock-up will be used:
 - 2.2.2.1. To judge quality of work, substrate preparation, operation of equipment and material application and skill to MPI Architectural Painting Specification Manual standards.
 - 2.2.3. Locate where indicated

- 2.2.4. Allow 24 hours for inspection of mock-up before proceeding with Work.
- 2.2.5. When accepted, mock-up will demonstrate minimum standard of quality required for this work. Approved mock-up may remain as part of finished work.

1.7 Delivery, storage and handling

1. Deliver, store and handle materials in accordance with Section 01 61 00 - Common Product Requirements and with manufacturer's written instructions.
2. Delivery and Acceptance Requirements: deliver materials to site in original factory packaging, labelled with manufacturer's name and address.
 - 2.1. Labels: to indicate:
 - 2.1.1. Type of paint or coating.
 - 2.1.2. Compliance with applicable standard.
 - 2.1.3. Colour number in accordance with established colour schedule.
3. Storage and Handling Requirements:
 - 3.1. Store materials off ground indoors in dry location and in accordance with manufacturer's recommendations in clean, dry, well-ventilated area.
 - 3.2. Observe manufacturer's recommendations for storage and handling.
 - 3.3. Store materials and supplies away from heat generating devices.
 - 3.4. Store materials and equipment in well ventilated area with temperature range 7 degrees C to 30 degrees C.
 - 3.5. Keep areas used for storage, cleaning and preparation, clean and orderly to approval of Consultant. After completion of operations, return areas to clean condition to approval of Consultant.
 - 3.6. Remove paint materials from storage only in quantities required for same day use.
 - 3.7. Comply with requirements of Workplace Hazardous Materials Information System (WHMIS) regarding use, handling storage, and disposal of hazardous materials.
 - 3.8. Fire Safety Requirements:
 - 3.8.1. Provide one kg Type ABC fire extinguisher adjacent to storage area.
 - 3.8.2. Store oily rags, waste products, empty containers and materials subject to spontaneous combustion in ULC approved, sealed containers and remove from site on a daily basis.
 - 3.8.3. Handle, store, use and dispose of flammable and combustible materials in accordance with the National Fire Code of Canada (NFC).
4. Develop Construction Waste Management Plan related to Work of this Section and in accordance with Section 01 35 21 - LEED Requirements.
5. Packaging Waste Management: remove for reuse and return of packaging materials as specified in Construction Waste Management Plan in accordance with Section 01 74 19 - Waste Management and Disposal.

1.8 Site conditions

1. Ambient Conditions:
 - 1.1. Heating, Ventilation and Lighting:
 - 1.1.1. Ventilate enclosed spaces.
 - 1.1.2. Provide heating facilities to maintain ambient air and substrate temperatures above 10 degrees C for 24 hours before, during and after paint application until paint has cured sufficiently.

- 1.1.3. Provide continuous ventilation for 7 days after completion of application of paint.
- 1.1.4. Coordinate use of existing ventilation system with Consultant and ensure its operation during and after application of paint as required.
- 1.1.5. Provide temporary ventilating and heating equipment where permanent facilities are not available or supplemental ventilating and heating equipment if ventilation and heating from existing system is inadequate to meet minimum requirements.
- 1.1.6. Provide minimum lighting level of 323 Lux on surfaces to be painted.
- 1.1.7. Temperature, Humidity and Substrate Moisture Content Levels:
 - 1.1.7.1. Unless pre-approved written approval by Paint Inspection Agency Authority and product manufacturer, perform no painting when:
 - 1.1.7.1.1. Ambient air and substrate temperatures are below 10 degrees C.
 - 1.1.7.1.2. Substrate temperature is above 32 degrees C unless paint is specifically formulated for application at high temperatures.
 - 1.1.7.1.3. Substrate and ambient air temperatures are not expected to fall within MPI or paint manufacturer's prescribed limits.
 - 1.1.7.1.4. The relative humidity is under 85% or when the dew point is more than 3 degrees C variance between the air/surface temperature. Paint should not be applied if the dew point is less than 3 degrees C below the ambient or surface temperature. Use sling psychrometer to establish the relative humidity before beginning paint work.
 - 1.1.7.1.5. Rain or snow are forecast to occur before paint has thoroughly cured or when it is foggy, misty, raining or snowing at site.
 - 1.1.7.1.6. Ensure that conditions are within specified limits during drying or curing process, until newly applied coating can itself withstand 'normal' adverse environmental factors.
 - 1.1.7.2. Perform painting work when maximum moisture content of the substrate is below:
 - 1.1.7.2.1. 12% for concrete and masonry (clay and concrete brick/block). Allow new concrete and masonry to cure minimum of 28 days.
 - 1.1.7.2.2. 15% for hard wood.
 - 1.1.7.2.3. 17% for soft wood.
 - 1.1.7.2.4. 12% for plaster and gypsum board.
 - 1.1.7.3. Test for moisture using calibrated electronic Moisture Meter. Test concrete floors for moisture using "cover patch test".
 - 1.1.7.4. Test concrete, masonry and plaster surfaces for alkalinity as required.
- 1.1.8. Surface and Environmental Conditions:
 - 1.1.8.1. Apply paint finish in areas where dust is no longer being generated by related construction operations or when wind or ventilation conditions are such that airborne particles will not affect quality of finished surface.
 - 1.1.8.2. Apply paint to adequately prepared surfaces and to surfaces within moisture limits.
 - 1.1.8.3. Apply paint when previous coat of paint is dry or adequately cured.
- 1.1.9. Additional interior application requirements:
 - 1.1.9.1. Apply paint finishes when temperature at location of installation can be satisfactorily maintained within manufacturer's recommendations.

- 1.1.9.2. Apply paint in occupied facilities during silent hours only. Schedule operations to approval of Consultant such that painted surfaces will have dried and cured sufficiently before occupants are affected.

Part 2 Products

2.1 Colours

1. P1: Primary Color, Dulux, DLX1164-3 BLUSTERY DAY, Eggshell finish.
2. P3: Door color: Dulux, DLX1024-4 MOTH GRAY, Semi-Gloss.
3. P2: Door frame: Dulux, DLX1102-1 ENDURING ICE, Semi-gloss
4. P4: Accent Color, Dulux, DLX1155-5 Dresden Dream, Eggshell finish

2.2 Mixing and tinting

1. Perform colour tinting operations prior to delivery of paint to site. Obtain written approval from Consultant for tinting of painting materials.
2. Mix paste, powder or catalyzed paint mixes in accordance with manufacturer's written instructions.
3. Use and add thinner in accordance with paint manufacturer's recommendations. Do not use kerosene or similar organic solvents to thin water-based paints.
4. Thin paint for spraying in accordance with paint manufacturer's instructions.
5. Re-mix paint in containers prior to and during application to ensure break-up of lumps, complete dispersion of settled pigment, and colour and gloss uniformity. Strain as necessary.

2.3 Gloss/sheen ratings

- 1.

Gloss @ 60 degrees Sheen @ 85 degrees

Gloss Level 1 - Matte Finish (flat)	Max. 5	Max. 10
Gloss Level 2 - Velvet-Like Finish	Max.10	10 to 35
Gloss Level 3 - Eggshell Finish	10 to 25	10 to 35
Gloss Level 4 - Satin-Like Finish	20 to 35	min. 35
Gloss Level 5 - Traditional Semi-Gloss Finish	35 to 70	
Gloss Level 6 - Traditional Gloss	70 to 85	
Gloss Level 7 - High Gloss Finish	More than 85	

2. Gloss level ratings of painted surfaces as noted on Finish Schedule.

2.4 Interior painting systems

1. Galvanized metal: doors, frames, railings, misc. steel, pipes, overhead decking, and ducts.
1.1. INT 5.3A - Latex insert gloss level (over cementitious primer) finish.
2. Plaster and gypsum board: gypsum wallboard, drywall, "sheet rock type material", and textured finishes:

- 2.1. Dulux Lifemaster,
 - 2.1.1. eggshell finish for walls
 - 2.1.2. Flat finish for ceiling

2.5 Source quality control

1. Perform following tests on each batch of consolidated post-consumer material before surface coating is reformulated and canned. Testing by laboratory or facility which has been accredited by Standards Council of Canada.
 - 1.1. Lead, cadmium and chromium are to be determined using ICP-AES (Inductively Coupled Plasma - Atomic Emission Spectroscopy) technique no. 6010 as defined in EPA SW-846
 - 1.2. Mercury is to be determined by Cold Vapour Atomic Absorption Spectroscopy using Technique no. 7471 as defined in EPA SW-846
 - 1.3. Organochlorines and PCBs are to be determined by Gas Chromatography using Technique no. 8081 as defined in EPA SW-846

Part 3 Execution

3.1 Manufacturer's instructions

1. Compliance: comply with manufacturer's written recommendations or specifications, including product technical bulletins, handling, storage and installation instructions, and data sheet.

3.2 General

1. Perform preparation and operations for interior painting in accordance with MPI Architectural Painting Specifications Manual except where specified otherwise
2. Apply paint materials in accordance with paint manufacturer's written application instructions.

3.3 Examination

1. Verification of Conditions: verify that conditions of substrate previously installed under other Sections or Contracts are acceptable to be painted in accordance with manufacturer's written instructions.
 - 1.1. Visually inspect substrate in presence of Consultant.
 - 1.2. Inform Consultant of unacceptable conditions immediately upon discovery.
 - 1.3. Proceed with installation only after unacceptable conditions have been remedied and after receipt of written approval to proceed from Consultant.
2. Interior repainting work: inspected by MPI Accredited Paint Inspection Agency (inspector) acceptable to specifying authority and local Painting Contractor's Association. Painting contractor to notify Paint Inspection Agency minimum of one week prior to commencement of work and provide copy of project repainting specification and Finish Schedule.
3. Interior surfaces requiring repainting: inspected by both painting contractor and Paint Inspection Agency who will notify Consultant in writing of defects or problems, prior to commencing repainting work, or after surface preparation if unseen substrate damage is discovered.
4. Conduct moisture testing of surfaces to be painted using properly calibrated electronic moisture meter, except test concrete floors for moisture using simple "cover patch test". Do not proceed with work until conditions fall within acceptable range as recommended by manufacturer.
5. Maximum moisture content as follows:
 - 5.1. Stucco, plaster and gypsum board: 12%.
 - 5.2. Concrete: 12%.

5.3. Clay and Concrete Block/Brick: 12%.

5.4. Hard Wood: 15%.

5.5. Soft Wood: 17%.

3.4 Preparation

1. Protection (not applicable to new painting work):
 - 1.1. Protect existing building surfaces and adjacent structures from paint spatters, markings and other damage by suitable non-staining covers or masking. If damaged, clean and restore surfaces as directed by Consultant.
 - 1.2. Protect items that are permanently attached such as Fire Labels on doors and frames.
 - 1.3. Protect factory finished products and equipment.
 - 1.4. Protect passing pedestrians, building occupants and general public in and about the building.
2. Surface Preparation (not applicable to new painting work):
 - 2.1. Remove electrical cover plates, light fixtures, surface hardware on doors, bath accessories and other surface mounted equipment, fittings and fastenings prior to undertaking painting operations. Identify and store items in secure location and re-installed after painting is completed.
 - 2.2. Move and cover furniture and portable equipment as necessary to carry out painting operations. Replace as painting operations progress.
 - 2.3. Place "WET PAINT" signs in occupied areas as painting operations progress. Signs to approval of Consultant.
3. Clean and prepare surfaces in accordance with MPI Architectural Painting Specification Manual requirements. Refer to MPI Manual in regard to specific requirements and as follows:
 - 3.1. Remove dust, dirt, and other surface debris by vacuuming, wiping with dry, clean cloths or compressed air.
 - 3.2. Wash surfaces with a biodegradable detergent and bleach where applicable and clean warm water using a stiff bristle brush to remove dirt, oil and other surface contaminants.
 - 3.3. Rinse scrubbed surfaces with clean water until foreign matter is flushed from surface.
 - 3.4. Allow surfaces to drain completely and allow to dry thoroughly.
 - 3.5. Prepare surfaces for water-based painting, water-based cleaners should be used in place of organic solvents.
 - 3.6. Use trigger operated spray nozzles for water hoses.
 - 3.7. Many water-based paints cannot be removed with water once dried. Minimize use of mineral spirits or organic solvents to clean up water-based paints.
4. Prevent contamination of cleaned surfaces by salts, acids, alkalis, other corrosive chemicals, grease, oil and solvents before prime coat is applied and between applications of remaining coats. Apply primer, paint, or pretreatment as soon as possible after cleaning and before deterioration occurs.
5. Where possible, prime non-exposed surfaces of new wood surfaces before installation. Use same primers as specified for exposed surfaces.
 - 5.1. Apply sealer to MPI #36 over knots, pitch, sap and resinous areas
 - 5.2. Apply wood filler to nail holes and cracks.
 - 5.3. Tint filler to match stains for stained woodwork.
6. Sand and dust between coats as required to provide adequate adhesion for next coat and to remove defects visible from a distance up to 1000 mm.

7. Carried out during shop priming: clean metal surfaces to be painted by removing rust, loose mill scale, welding slag, dirt, oil, grease and other foreign substances in accordance with MPI requirements. Remove traces of blast products from surfaces, pockets and corners to be painted by vacuum cleaning or blowing with clean dry compressed air.
8. Touch up of shop primers with primer as specified.
9. Do not apply paint until prepared surfaces have been accepted by Consultant

3.5 Existing conditions

1. Conduct moisture testing of surfaces to be painted using properly calibrated electronic moisture meter, except test concrete floors for moisture using simple "cover patch test" and report findings to Consultant. Do not proceed with work until conditions fall within acceptable range as recommended by manufacturer.
2. Maximum moisture content as follows:
 - 2.1. Stucco: 12%.
 - 2.2. Concrete: 12%.
 - 2.3. Clay and Concrete Block/Brick: 12%.
 - 2.4. Hard Wood: 15%.
 - 2.5. Soft Wood: 17%.

3.6 Application

1. Method of application to be as approved by Consultant. Apply paint by brush roller air sprayer. Conform to manufacturer's application instructions unless specified otherwise.
2. Brush and Roller Application:
 - 2.1. Apply paint in uniform layer using brush and/or roller type suitable for application.
 - 2.2. Work paint into cracks, crevices and corners.
 - 2.3. Paint surfaces and corners not accessible to brush using spray, daubers and/or sheepskins. Paint surfaces and corners not accessible to roller using brush, daubers or sheepskins.
 - 2.4. Brush and/or roll out runs and sags, and over-lap marks. Rolled surfaces free of roller tracking and heavy stipple.
 - 2.5. Remove runs, sags and brush marks from finished work and repaint.
3. Spray application:
 - 3.1. Provide and maintain equipment that is suitable for intended purpose, capable of atomizing paint to be applied, and equipped with suitable pressure regulators and gauges.
 - 3.2. Keep paint ingredients properly mixed in containers during paint application either by continuous mechanical agitation or by intermittent agitation as frequently as necessary.
 - 3.3. Apply paint in uniform layer, with overlapping at edges of spray pattern. Back roll first coat application.
 - 3.4. Brush out immediately all runs and sags.
 - 3.5. Use brushes and rollers to work paint into cracks, crevices and places which are not adequately painted by spray.
4. Use dipping, sheepskins or daubers only when no other method is practical in places of difficult access.
5. Apply coats of paint continuous film of uniform thickness. Repaint thin spots or bare areas before next coat of paint is applied.

6. Allow surfaces to dry and properly cure after cleaning and between subsequent coats for minimum time period as recommended by manufacturer.
7. Sand and dust between coats to remove visible defects.
8. Finish surfaces both above and below sight lines as specified for surrounding surfaces, including such surfaces as tops of interior cupboards and cabinets and projecting ledges.
9. Finish inside of cupboards and cabinets as specified for outside surfaces.
10. Finish closets and alcoves as specified for adjoining rooms.
11. Finish top, bottom, edges and cutouts of doors after fitting as specified for door surfaces.
12. Wood, drywall, plaster, stucco, concrete, concrete masonry units and brick; if sprayed, must be back rolled.

3.7 Site tolerances

1. Walls: no defects visible from a distance of 1000 mm at 90 degrees to surface.
2. Ceilings: no defects visible from floor at 45 degrees to surface when viewed using final lighting source.
3. Final coat to exhibit uniformity of colour and uniformity of sheen across full surface area.

3.8 Site quality control

1. Interior painting and decorating work to be inspected by a MPI Accredited Paint Inspection Agency (inspector) acceptable to specifying authority and local Painting Contractor's Association. Painting contractor will notify Paint Inspection Agency a minimum of one week prior to commencement of work and provide a copy of project painting specification, plans and elevation drawings (including pertinent details) as well as a Finish Schedule.
2. Interior surfaces requiring painting to be inspected by Paint Inspection Agency who will notify Consultant and General Contractor in writing of defects or problems, prior to commencing painting work, or after prime coat shows defects in substrate.
3. Standard of Acceptance:
 - 3.1. Walls: no defects visible from a distance of 1000 mm at 90 degrees to surface.
 - 3.2. Ceilings: no defects visible from floor at 45 degrees to surface when viewed using final lighting source.
 - 3.3. Final coat to exhibit uniformity of colour and uniformity of sheen across full surface area.
4. Field inspection of painting operations to be carried out by independent inspection firm as designated by Consultant.
5. Advise Consultant when surfaces and applied coating is ready for inspection. Do not proceed with subsequent coats until previous coat has been approved.
6. Cooperate with inspection firm and provide access to areas of work.
7. Retain purchase orders, invoices and other documents to prove conformance with noted MPI requirements when requested by Consultant.

3.9 Cleaning

1. Progress Cleaning: clean in accordance with Section 01 74 00 - Cleaning.
 - 1.1. Leave Work area clean at end of each day.
2. Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment in accordance with Section 01 74 00 - Cleaning.

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

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

3.10 Restoration

1. Clean and re-install hardware items removed before undertaken painting operations.
2. Remove protective coverings and warning signs as soon as practical after operations cease.
3. Remove paint splashings on exposed surfaces that were not painted. Remove smears and spatter immediately as operations progress, using compatible solvent.
4. Protect freshly completed surfaces from paint droppings and dust to approval of Consultant. Avoid scuffing newly applied paint.
5. Restore areas used for storage, cleaning, mixing and handling of paint to clean condition as approved by Consultant.

End of Section

Section 13 49 00

Radiation Protection

Part 1 General

1.1 Section includes

1. Sheet lead applied to walls.
2. Lead lined doors.
3. Lead lining to door frames.

1.2 Related requirements

1. Section 09 21 16 - Gypsum Board Assemblies: Wall substrate construction.
2. Section 06 10 53 - Miscellaneous Rough Carpentry: Wood furring to attach lead and lead laminated gypsum lath.
3. Section 08 71 00 - Door Hardware - General.
4. Section 09 21 16 - Gypsum Board Assemblies: Joint taping over lead lined gypsum board.
5. Section 09 91 00 - Painting: Field painting.
6. Division 26 – Electrical: Light fixtures with associated components and wire with radiation protection.

1.3 Reference standards

1. APA (The Engineered Wood Association) - Product Guide Grades and Specifications.
2. [ASTM B749-20 Standard specification for lead and lead alloy strip, sheet, and plate products](#)
3. [ASTM C1396/C1396M-17 Standard specification for gypsum board](#)
4. [ASTM C1036-21 Standard specification for flat glass](#)
5. [ASTM C1048-18 Standard specification for heat-strengthened and fully tempered flat glass](#)
6. [Canadian plywood handbook](#)
7. [REP 049 Structural shielding design and evaluation for medical use of X rays and gamma rays of energies up to 10 MeV](#)

1.4 Administrative requirements

1. Section 01 31 00: Project management and coordination procedures.
2. Coordination:
 - 2.1. Coordinate with other work having a direct bearing on work of this section.
 - 2.2. Coordinate the work with construction of partitions, placement of frames and other adjoining elements.
3. Pre-installation Meetings: Convene one (1) week before starting work of this section.

1.5 Definitions

1. Lead Equivalence: Thickness of lead that provides same attenuation (reduction of radiation passing through) as material in question under specified conditions. Lead equivalence specified for materials used in diagnostic X-Ray rooms is measured at 150 kV unless indicated otherwise.

1.6 Action submittals

1. Section 01 33 00: Submission procedures.
2. Product Data: Manufacturer's data sheets on each product to be used, including:
 - 2.1. Preparation instructions and recommendations.
 - 2.2. Storage and handling requirements and recommendations.
 - 2.3. Installation methods.
3. Shop Drawings:
 - 3.1. Indicate dimensions, description of materials and finishes and general construction.
 - 3.2. Indicate layout of radiation-protected areas.
 - 3.3. Indicate lead thickness or lead equivalencies of components.
4. Samples:
 - 4.1. Selection Samples: For each finish product specified, two complete sets of color chips representing manufacturer's full range of available colors and patterns.
 - 4.2. Verification Samples: For each finish product specified, two samples, minimum size 6 inches (150 mm) square, representing actual product, color, and patterns.

1.7 Informational submittals

1. Section 01 33 00: Submission procedures.
2. Installation Data: Manufacturer's special installation requirements.
3. Manufacturer's Certificate: Certify that leaded glazing capabilities meet or exceed specified requirements.

1.8 Closeout submittals

1. Section 01 78 00: Submission procedures.

1.9 Quality assurance

1. Products of This Section: Manufactured to ISO 9000 certification requirements.
2. Perform Work in accordance with one (1) copy requirements and NRCR Report No. 049 regulations. Maintain copies of document on site.
3. Manufacturer Qualifications: Company specializing in manufacturing the Products specified in this section with minimum five (5) years documented experience.
4. Installer Qualifications: Company specializing in performing the work of this section with minimum three (3) years documented experience and approved by the manufacturer.
5. Radiation Protection Survey: Employ registered X-Ray physicist, certified by American Board of Radiology, for testing specified radiation protective Work and to conduct radiation protection survey of facility after radiation shielding materials are installed.
 - 5.1. Take radiation measurements and indicate evaluation of measurements in report. Submit report to Architect and Owner upon completion of report.
 - 5.2. Take radiation measurements in locations indicated by Architect.
6. Radiation Protection Work: Comply with National Council of Radiation Protection (NCRP) Report No. 049 - Structural Shielding Design and Evaluation for Medical Use of X-Rays and Gamma Rays of Energies up to 10 MeV.
 - 6.1. Comply with requirements of local regulatory agencies where local standards and criteria exceed requirements of NCRP Report No. 049.

7. Single Source Responsibility: Obtain radiation protection materials and accessories produced as standard products from single manufacturer regularly engaged in production of X-Ray shielding materials, equipment, and accessories.

1.10 Mock-ups

1. Section 01 43 00: Requirements for mock-up.
2. Mock-up shall be used for testing purposes to verify the protection integrity of the Work of this section.
3. Locate where directed by Consultant.
4. Approved mock-up may remain as part of the Work.

1.11 Warranty

1. Provide manufacturer's standard limited warranty.

Part 2 Products

2.1 Manufacturers - sheet lead materials

1. Lead Sheeting;
 - 1.1. Canada Metal (Pacific) Ltd, <http://cmpgroup.net/>
7733 Progress Way
Delta, BC
V4G 1A3
Phone 604.940.2010
Fax 604.952.2650
 - 1.2. Or approved equivalent.
2. Substitutions: Refer to Section 01 25 00.

2.2 Description

1. System Description:
 - 1.1. Protection: Walls, fixed control screens, ceiling, floor, including wall interruptions for doors.
2. Regulatory Requirements:
 - 2.1. Conform to applicable health and occupation code for integrity of radiation protection and continuity of protected construction.

2.3 Sheet lead and associated materials

1. Sheet Lead: ASTM B749, Type 99.9% pure rolled lead sheeting, 4lb lead, 1/16" thick.
2. Gypsum Board: ASTM C1396/C1396M, paper/paper faced, square edges and square ends; 1200 x 2400 mm size, 5/8 inch thick.
3. Nails: Lead headed to twice thickness of sheet lead.
4. Tie Wire: Lead steel, annealed.

2.4 Components and accessories

1. Door: To meet lead equivalence of adjoining walls.
2. Radiation Protection Plaque: Wall mounted, designating lead thickness in wall, degree of continuity, exceptions.

2.5 Finishes

1. Primed metal surfaces: Colour as selected.
2. Prefinished Surfaces: Colour as selected.

Part 3 Execution

3.1 Examination

1. Section 01 71 00: Verify existing conditions before starting work.
2. Verify that existing surfaces are ready to receive work and opening dimensions are as indicated on Shop Drawings.

3.2 Installation - sheet lead

1. Lead Overlap - Flat walls: Lap edges and ends of lead sheets 3/4". Overlap should be arranged taking into consideration the location of the radiation source (x-ray tube, patient). Apply lead patches, same thickness as lead sheet, over penetrations, to achieve continuity of protection. Round headed screws should be used, otherwise they need to be capped with lead.
2. Lead Overlap - Angles: The lead overlap should to be arranged taking into consideration the location of the radiation source (x-ray tube, patient). The lead overlap should be 3/4".
3. Drywall: Inside all studs or I-channels, run a "lapping" strip where drywall screw penetrations will occur (or run a Pb "lap" the entire length inside the stud).
4. Extend lead protection from finished floor to height of 7'-0".
5. Ensure Pb on all walls is installed flat (without ripples) to ensure good, flat adhesion by drywall when gluing or attaching sheets.
6. Construct control screens as indicated.
7. Floor Protection: 143mm concrete.
8. Ceiling Protection: 147mm concrete.
9. Ductwork Protection: as indicated.
10. Conduit, electrical boxes, pipes, outlet box and other wall intrusion protection:
 - 10.1. Option 1 (preferred): Apply lead on the rear side of the studs. Because of the increased distance to the rear lead sheet, the overlap has to be increased to at least 10 cm at all edges.
 - 10.2. Option 2: Wrap the rear and sides of the boxes with lead. Only recommended for small electrical boxes. Lead should overlap by 2 cm at all joins.
11. Doors and window frames: Lead must overlap all doors and window frames to prevent line-of-sight openings for radiation to pass through. Note: When the thickness of the metal in the door or window frame is inadequate to provide sufficient shielding, the inside of the frame needs to be lined with lead worked into the contour of the frame to provide an effective overlap with the adjoining barrier.

Extend lead to completely abut interior of all door and window jambs, including sides and top.
12. Apply lead sheet patches around penetrations to sheet lead protection, extending 3/4" beyond penetration.

3.3 Installation - components and accessories

1. Install components and accessories to manufacturer's written instructions.
2. Install lead lined door frames as specified in Section 08 11 13.
3. Install lead lined doors in accordance with Section 08 14 16. Coordinate installation of door hardware.

4. Install lead lined panels as indicated.

3.4 Field quality control

1. Inspection and Testing:
 - 1.1. Section 01 45 00: Field testing and inspection.
 - 1.2. Inspection and testing will be performed by a licensed radiologist technician in coordination with regulatory agency requirements, to ascertain conformance of installation regarding radiation passage or leakage.
 - 1.3. Cooperate and offer assistance in such work. Execute written instructions given.

3.5 Schedules

1. Scan Room: Refer to NHA's Shielding assessment

End of Section

