LADYSMITH

Parks, Recreation, & Culture

Invitation to Tender
No. 2023-PRC-06

Arts and Heritage Hub

ADDENDUM #3

For further information:
Contact: Chris Barfoot
cbarfoot@ladysmith.ca
250.245.6421

Tender Issue Date:	Thursday, June 29, 2023
Addendum #1:	Thursday, July 6, 2023
Addendum #2	Thursday, July 31, 2023
Addendum #3	Thursday, August 10, 2023
Site Visit:	10:00 a.m., Friday, August 11, 2023
Tender Closing:	2:00 p.m., Thursday, August 24
Tender Opening:	2:15 p.m., Thursday, August 24, Ladysmith City Hall

Addendum #3: Invitation to Tender (ITT) No. 2023-PRC-06

Arts and Heritage Hub

This Addendum includes answers to proponents questions, and clarification.

Issued: August 10, 2023

This Addendum shall be read in conjunction with and considered as an integral part of the Invitation to Tender (ITT). Revisions supersede the information contained in the original ITT or previously issued Addendum. No consideration will be allowed for any extras due to any Proponents not being familiar with the contents of this Addendum. All other terms and conditions remain the same.

QUESTIONS & ANSWERS

1. ***Question:*** Is there list of bidders (company, contact & email). Are you able to send this to me please?

   Answer: The Town does not have a public registration program at this time for parties interested in procurement opportunities.

   At the Site Visit, scheduled for August 11, 2023 a list of attendees will be collected by the town.

   Interested parties are also welcome to view the RFT #173193 via BC Bid at: https://bcbid.gov.bc.ca/. Questions are also able to be submitted via the *Discussion Forum* on the BC Bid portal.

INCLUDE attached 'General Questions' to the ITT document.

End of Addendum #3

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Tender Addendum TA003

Contractor Reference: None

Date 2023.08.10

Project 2032 LAHH

Client Town of Ladysmith

The following addendum supersedes information contained in drawings, specifications and any previous addenda for the project to the extent referenced. This Addendum forms part of the tender documents and is subject to all of the conditions set out in the contract conditions.

General Questions

1. Please refer to attached document.

Reason for Change: Clarification

Distribution List

Chris Barfoot, Town of Ladysmith, cbarfoot@ladysmith.ca

Ben Checkwitch, Checkwitch Poiron Architects Inc., ben@cparch.ca

Per Hector Alcala, Architect AIBC

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TA003 - General Questions

1. The RFP package stipulates that a Bid Bond is to be included with all tenders; however, it does not specify the Bid Bond amount. Please confirm what percentage of the tender price the Bid Bond is to be.

A: The Bid Bond requirement will be established by the Town of Ladysmith.

2. Can survey files be provided for existing ground and design surfaces to assist in determining the required cut/fill volumes, and any engineered fill that must be imported to site?

A: Survey information will be provided as an attachment file.

3. Drawing S201 shows a 6” concrete suspended slab, however Architectural building sections appear to show a Slab-on-Grade. Please confirm which is correct.

A: It is a suspended slab, the back fill showed in the architectural drawing is not structural. The back fill is to facilitate the construction and to provide the transition between the building and the road in front of the building.

4. Further to the above, if a Slab-on-Grade is to be used please confirm requirements for under-slab aggregates and poly.

A: The suspended slab should be done as FC01. •10 mil polyethylene moisture barrier • 1-1/2" XPS insulation •6" compacted granular fill.

5. Drawing A111 notes that the Town of Ladysmith is responsible for new road construction. Please confirm whether this includes new 6” concrete curbs, or if new curbs are to be completed by the contractor.

A: The curb will be completed by the contractor. See extent as per drawing A111 and design detail as per typical road section on the civil drawings.

6. Addendum 2 notes that the Town of Ladysmith is responsible for material testing. Please clarify if this includes soil and granular compaction testing, concrete testing, etc.

A: The contractor is responsible to coordinate the testing. The Town of Ladysmith will be carrying the cost.

7. Please confirm if appliances are to be supplied by the contractor, and if so, please provide product specification

A: Appliances provided by contractor. Please see attached document with the specifications.

8. Please provide a paint specification, including manufacturer and colour, corresponding to PNT-01.

A: PNT-01 or PT-1 is Benjamin Moore Chantilly Lace OC-65. See attached cut sheet

9. Please provide a wall tile specification corresponding to TIL-01.

A: TIL-01 is Ames Linea LIWM1224 Plain White. See attached cut sheet

10. Please refer to the architectural master spec. See attached PDF.

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2032 LAHH

09 91 00 PNT– 01

Paint

–

Manufacturer	Benjamin Moore		
Model	–		
Type	–		
Size (inches)	W	D	H
Size (mm)	W	D	H

Finish OC-65 Chantily Lace

Submittals | Substitutions

Product data + sample N

Supply

Contractor

Install

Contractor

Status

Pending Selected Approved

Client Signoff

Client Signoff Date

General Notes See General Notes for MPI system and sheen.

Project Notes See General Notes for MPI system and sheen.

https://www.benjaminmoore.com/en-ca/colour-overview/find-your-colour/colour/oc-65/chantilly-lace?color=OC-65

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2032 LAHH

09 30 00 TIL–01

Wall Tile

Rectified Edge Tile

Manufacturer	Ames					
Model	Linea LIWM1224					
Type	–					
Size (inches)	12.00"	W	24.00"	D		H
Size (mm)	305	W	610	D	0	H

Submittals | Substitutions

Sample	N

Supply

Contractor

Install

Contractor

Material	Glazed Ceramic
Colour	Plain White
Finish	matte- rectified edge

Status

Pending **Selected** Approved

Client Signoff

Client Signoff Date

General Notes

Project Notes

http://www.amestile.com/liwm1224

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1. GENERAL

1.1. Summary

1. Refer to architectural drawings in conjunction with the specification.

1.2. Section Includes

1. Provide all labour, materials, tools, and other equipment, services and supervision required for installation of residential kitchen and laundry appliances and accessories as indicated on drawings and specified herein. Other building specialties may be contained in other Sections.

1.3. Shop Drawings

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

2. An itemized list showing location and number of each building specialty group is to accompany the shop drawings. Include Manufacturer's product specifications and installation instructions.

1.4. Maintenance

1. Submit in product maintenance information accordance with Section 01 78 00 – Closeout Submittals, for all building specialties

1.5. Waste Management and Disposal

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

2. Collect and separate plastic, paper packaging and corrugated cardboard in accordance with Waste Management Plan.

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

1.6. Energy Ratings

1. All appliances to qualify under BC Hydro's Power Smart New Home Program.

2. PRODUCTS

1. Refrigerator: Fisher & Paykel RF201AXJSX1_N

2. Range: LG LSE 4616ST

3. Range Hood: LG LSHD3080ST

4. Dishwasher: LG LDT7808ST

5. Microwave: LG LMC1575ST

3. EXECUTION

3.1. Installation

1. Set appliances in place, connect them, and leave them level, clean, and tested for proper operation. Ensure doors operate freely, without hitting or binding on kitchen cabinets. Refrigerator doors shall close by gravity, gently but securely. Set clocks to local time; install appliance lamps as required.

2. Reverse handing of refrigerator doors as necessary to suite reverse kitchen layouts.

3. Handle all appliances carefully during delivery and installation, and take care to avoid damage to finished wall surfaces and floor coverings. If damage occurs, notify General Contractor prior to leaving the jobsite.

4. Make good all damage to wall and floor surfaces at no additional cost to Owner, to satisfaction of Consultant.

3.2. Clean-up

1. remove all manufacturer's cartons, packing materials, metal bands and protective covers from the building premises and remove from jobsite.

2. Make a list of all appliances, models, and serial numbers cross referenced to location (suite numbers); forward list to Owner.

END OF SECTION

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Specifications

Project No. 2032

Arts and Heritage Hub

701 Oyster Bay Dr, Ladysmith, BC V9G 1B8

Prepared For: Town of Ladysmith, ATTN: Chris Barfoot

Prepared By: Checkwitch Poiron Architects Inc.

2023.04.03

ISSUED FOR TENDER

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END OF SECTION

1. GENERAL

1.1. Section Includes

1. General Requirements.
2. Title and description of Work.
3. Contract Method.
4. Work by others.
5. Work sequence.
6. Contractor use of premises.
7. Owner furnished items.

1.2. General Requirements

1. The term “Contractor” means “General Contractor”.
2. The specifications and drawings are prepared for the use by the General Contractor, who is solely responsible for subdividing the work amongst subcontractors. The General Contractor is responsible for all the work, whether or not subcontractors, or their subcontractors have performed any portions of the work. Differences in interpretation of the specifications or drawings as to which subcontractor are to provide certain work is not grounds for claims for extras. Ensure that when awarding subcontracts, the area of responsibility of any particular subcontract is set out in full detail.
    1. Example: if heating controls are required in the drawings and/or specifications, the Contractor is responsible is determining which subcontractor provides the heating controls. If the electrical and mechanical subcontractors assume the other is providing the heating controls, but neither does, the Contractor is still required to provide the specified heating controls at no additional cost.
3. The grammatical style of the specifications is intentionally abbreviated. When a paragraph commences with a verb, the “The Contractor shall” is inferred.
4. All drawings and specifications are to be read together as a set of documentation for the project. Any party bidding or working on any portion of the project is responsible for reviewing all project documentation, and is responsible for being aware of all drawings and specifications that may affect their portion of the work.
5. All communication from the Contractor or the subcontractors to Consultants is to be routed through the Contractor to the Architect; the Architect will then distribute the communication to the appropriate Consultant for comment.
6. Contractor and subcontractors are to report all discrepancies in project documentation immediately upon discovery for clarification. The most expensive or stringent option or requirement should be selected and fully documented when conflicting information is discovered and there is no time for clarification during bidding.

1.3. Work Covered by Contract Documents

1. Work of this Contract comprises general construction of a one storey, 3 studios art centre, located at 610 Oyster Bay Dr, Ladysmith, BC; and further identified as *Arts and Heritage Hub*.

1.4. Contract Method

1. Construct the Work under a construction management contract.

1.5. Work by Others

1. Work of Project executed during Work of this Contract, and which is specifically excluded from this Contract:

    1. The re-alignment of Oyster Bay Drive. This work should be carried by the Town of Ladysmith.

1.6. Work Sequence

1. 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.

2. Required stages:

    1. Determine if Oyster Bay Dr. Is going to be accessible under construction or temporary closed.

    2. Once Oyster Bay Dr. Is realigned the site can be fully enclosed from public access.

3. Maintain fire access/control.

1.7. Contractor Use of Premises

1. Contractor shall limit use of premises for Work, for storage, and for access, to allow;

    1. Work by other contractors.

    2. Public usage and use of Oyster Bay Dr.

2. Coordinate use of premises under direction of Owner and Engineer Department from the Town of Ladysmith.

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

1.8. Owner Furnished Items

1. Owner Responsibilities:

    1. Arrange for delivery of shop drawings, product data, samples, manufacturer’s instructions, and certificates to Contractor.

    2. Deliver supplier's bill of materials to Contractor.

    3. Arrange and pay for delivery to site in accordance with Progress Schedule.

    4. Inspect deliveries jointly with Contractor.

    5. Submit claims for transportation damage.

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

    7. Arrange for manufacturer's field services; arrange for and deliver manufacturer’s warranties and bonds to Contractor.

2. Contractor Responsibilities:

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

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

3. Receive and unload products at site.
4. Inspect deliveries jointly with Owner; record shortages, and damaged or defective items.
5. Handle products at site, including uncrating and storage.
6. Protect products from damage, and from exposure to elements.
7. Assemble, install, connect, adjust, and finish products.
8. Provide installation inspections required by public authorities.
9. Repair or replace items damaged by Contractor or Subcontractor on site (under his control).

2. PRODUCTS (NOT APPLICABLE)

3. EXECUTION (NOT APPLICABLE)

END OF SECTION

1. GENERAL

1.1. Section Includes

1. Connecting to existing services.
2. Permits and regulatory requirements.

1.2. Existing Services

1. Notify Engineer and utility companies of intended interruption of services and obtain required permission; contact municipal authorities where required.
2. Where Work involves breaking into or connecting to existing services, give Engineer forty-eight (48) hours of notice for necessary interruption of mechanical or electrical service throughout course of work. Keep duration of interruptions minimum. Carry out interruptions after normal working hours of occupants, preferably on weekends.
3. Provide for personnel, pedestrian, and vehicular traffic.
4. Construct barriers in accordance with Section 01 56 00 – Temporary Barriers and Enclosures.

1.3. Permits and Regulatory Requirements

1. Conform to codes, ordinances, regulations and orders of all authorities having jurisdiction on the performance of the Work, and obtain and pay for all necessary permits, fees, licences, and certificates of inspection as may be required by local or provincial regulations, bylaws or ordinances, except those obtained by the Owner – include all other permit fees.
2. Should conflicts arise between one document or authority and another, obtain clarification from the Consultant before proceeding with the Work.
3. “Authority having jurisdiction” means authorities that have within their constituted power the right to enforce laws at place of building.

2. PRODUCTS (NOT APPLICABLE)

3. EXECUTION (NOT APPLICABLE)

END OF SECTION

1. GENERAL

1.1. Section Includes

1. Cash allowances.
2. Contingency allowance.

1.2. References

1. Canadian Construction Documents Committee (CCDC).
2. CCDC 2 – 2008, Stipulated Price Contract.

1.3. Cash Allowances

1. Refer to CCDC 2, GC 4.1.
2. Include in Contract Price, cash allowances stated herein.
3. Cash allowances, unless otherwise specified, cover net cost to Contractor and Subcontractor of services, products, construction machinery and equipment, freight, handling, unloading, storage, installation and other authorized expenses incurred in performing Work.
4. The Contract Price, and not cash allowance, includes Contractor's overhead and profit in connection with such cash allowance.
5. The Contract Price will be adjusted by written order to provide for an excess or deficit to each cash allowance.
6. Where costs under a cash allowance exceed amount of allowance, Contractor will be compensated for any excess incurred and substantiated plus an allowance for overhead and profit as set out in Contract Documents.
7. Progress payments on accounts of work authorized under cash allowances shall be included in Consultant's monthly certificate for payment.
8. A schedule shall be prepared jointly by Consultant and Contractor to show when items called for under cash allowances must be authorized by Consultant for ordering purposes so that progress of Work will not be delayed.

1.4. Contingency Allowance

1. Refer to CCDC 2, GC 4.2.

2. PRODUCTS (NOT APPLICABLE)

3. EXECUTION (NOT APPLICABLE)

END OF SECTION

1. GENERAL

1.1. Section Includes

1. Product Installation Alternatives to Agreement and work.

Incorporation of accepted Alternatives into Agreement.

1. Requirements

2. Referenced specification Sections stipulate pertinent requirements for products and methods to achieve the Work stipulated under each Alternative.

3. Coordinate affected related Work and modify surrounding Work to integrate the Work under each Alternative.

1.2. Award / Selection of Alternatives

1. Indicate variation of Bid Price for Alternatives described below and listed in Supplementary Bid Information Form. Note that this form requests a 'difference' in Bid Price by adding to or deducting from the base Bid price.

2. Bids shall be evaluated on 'Base Bid' price. After determination of preferred Bidder, consideration

1.3. Alternatives

1. Alternative No. 1

    1. Base Bid: Raico Therm+, with wood beauty cap specified in Section 08 11 16 – Aluminum Doors and Frames.

    2. Alternative: Kawneer 1620UT Aluminum window frame with custom wood beauty cap as specified in Section 08 11 16 - Aluminum Doors and Frames.Alternative No. 2

2. Alternative No. 2

    1. Remove a couple wall cabinets in the kitchen room.

3. Alternative No. 3

    1. Add paved area for 10 parking stalls at the south of the building, currently graved parking area.

    2. Add paving for Oyster Bay Dr. As described on civil drawings of phase .

1. PRODUCTS (NOT APPLICABLE)

2. EXECUTION (NOT APPLICABLE)

END OF SECTION

1. GENERAL

1.1. Section Includes

1. Applications for payments.
2. Substantial performance procedures.
3. Release of holdback procedures.
4. Schedule of values.

1.2. References

1. Owner/Contractor Agreement.

1.3. Applications for Progress Payment

1. Make applications for payment on account as provided in Agreement (monthly) as Work progresses.
2. 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.
3. Submit to Consultant, at least fourteen (14) days before first application for payment Schedule of Values for parts of Work, aggregating total amount of Contract Price, so as to facilitate evaluation of applications for payment.

1.4. Schedule of Values

1. Make schedule of values out in such form and supported by such evidence as Consultant may reasonably direct and when accepted by Consultant, be used as basis for applications for payment.
2. Include statement based on schedule of values with each application for payment.
3. 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.

1.5. Preparing Schedule of Unit Price Table Items

1. Submit separate schedule of unit price items of Work requested in Bid form.
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. Cost of material.
    2. Delivery and unloading at site.
    3. Sales taxes.
    4. Installation, overhead and profit.
3. Ensure unit prices multiplied by quantities given equal material cost of that item in Schedule of Values.

1.6. Progress Payment

1. Consultant will issue to Owner, no later than ten (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 properly due. If Consultant amends application, Consultant will give notification in writing giving reasons for amendment and Contractor to resubmit application for payment.

1.7. Substantial Performance of Work

1. 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. Failure to include an item on list does not alter responsibility to complete Contract.

2. No later than ten (10) days after receipt of list and application, Consultant will review Work to verify validity of application, and no later than seven (7) days after completing review, will notify Contractor if Work or designated portion of Work is substantially performed.

3. Consultant shall state date of Substantial Performance of Work or designated portion of Work in certificate.

4. Immediately following issuance of certificate of Substantial Performance of Work, in consultation with Consultant, establish reasonable date for finishing Work.

1.8. Payment of Holdback Upon Substantial Performance of Work

1. After issuance of certificate of Substantial Performance of Work:

    1. Submit an application for payment of holdback amount.

    2. Submit sworn statement that all 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 any way 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 issue certificate for payment of holdback amount.

3. Where holdback amount has not been placed in a separate holdback account, Owner shall, ten (10) 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 that may be agreed to between parties. Owner may retain out of holdback amount any sums required by law to satisfy any 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.

1.9. Progressive Release of Holdback

1. If Consultant has certified that Work of subcontractor or supplier has been performed prior to Substantial Performance of Work, Owner shall 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.

2. Notwithstanding provisions of preceding paragraph, and notwithstanding wording of such certificates, 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.

1.10. Final Payment

1. Submit an application for final payment when Work is completed.

2. Consultant will, no later than ten (10) days after receipt of an 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 seven (7) days after reviewing Work.

3. Consultant will issue final certificate for payment when application for final payment is found valid.

2. PRODUCTS (NOT APPLICABLE)

3. EXECUTION (NOT APPLICABLE)

END OF SECTION

1. GENERAL

1.1. Section Includes

1. Coordination Work with other contractors and work by Owner under administration of Consultant.

2. Scheduled pre-construction and progress meetings.

1.2. Description

1. Coordination of progress schedules, submittals, use of site, temporary utilities, construction facilities, and construction Work, with progress of Work of other contractors and Work by Owner, under instructions of Consultant(s).

1.3. Project Meetings

1. Schedule and administer project meetings throughout progress of Work as determined by Consultant.

2. Contractor to prepare agenda for meetings.

3. Contractor to distribute written notice of each meeting four working days in advance of meeting date to all Consultants, and the Owner.

4. Contractor to provide physical space and arrange for meetings.

5. Contractor to preside at meetings.

6. Contractor to record minutes. Include significant proceedings and decisions. Identify action by parties.

7. Contractor to reproduce and distribute copies of minutes within three (3) working days after each meeting and transmit to meeting participants, and affected parties not in attendance, including Consultants and the Owner.

1.4. Construction Organization and Start-up

1. Within seven (7) days after award of Contract, request a meeting of parties in contract to discuss and resolve administrative procedures, responsibilities, and scheduling.

    1. During this meeting the Architect will want to review key design elements and their coordination with contractors, sub-contractors and suppliers.

2. Schedule a meeting to discuss and resolve administrative procedures, responsibilities, and scheduling, within fifteen (15) days of issuance of “Notice to Proceed” letter.

3. Senior representatives of the Owner, Consultants, Contractor (project manager and superintendent), major Subcontractors, field inspectors will be in attendance. Attendees must be qualified and authorized to act on behalf of the party each represents.

4. Establish time and location of meeting and notify parties concerned minimum five (5) working days before meeting.

5. Incorporate mutually agreed variations to Contract Documents into Agreement, prior to signing.

6. Agenda to include following:

    1. Project Description – name, civic address, site information, project statistics.

    2. Project Team – Appointment of official representative of participants in Work; roles and responsibilities for all parties.

3. Schedule of Work, progress scheduling in accordance with Section 01 32 00 – Construction Progress Documentation.

4. Pre-construction Documents – construction contract requirements, schedule of values, insurances and transcript of policies (GC), bonds, WCB status, etc.

5. Monthly progress claims, administrative procedures, photographs, and holdbacks (GC).

6. Requests for Information (RFI) – to be sequentially numbered by the contractor and include names of sub trades. RFIs to be separated by topic.

7. Supplemental instructions, proposed changes, change orders, procedures, approvals required, mark-up percentages permitted, time extensions, overtime, and administrative requirements (GC).

8. Field reviews – all consultant reviews are submitted to the contractor with all team members copied.

9. Contract Document Review – construction documentation.

10. Schedule of submission of shop drawings, samples, colour chips in accordance with Section 01 33 00 – Submittal Procedures.

11. Appointment of inspection and testing agencies or firms in accordance with Section 01 45 00 – Quality Control.

12. Review of mock-ups required in accordance with Section 01 45 00 – Quality Control.

13. Requirements for temporary facilities, site sign, offices, storage sheds, utilities, fences in accordance with Section 01 51 00 – Temporary Utilities.

14. Delivery schedule of specified equipment in accordance with Section 01 32 00 – Construction Progress Documentation.

15. Site security in accordance with Section 01 52 00 – Construction Facilities.

16. Owner provided Products.

17. Record drawings in accordance with Section 01 78 00 – Closeout Submittals.

18. Maintenance in accordance with Section 01 78 00 – Closeout Submittals.

19. Take-over procedures, acceptance, warranties, substantial performance documents and procedures in accordance with Section 01 77 00 – Closeout Procedures and 01 78 00 – Closeout Submittals.

20. Lien Holdback – early release of holdbacks and documentation.

21. Municipal Requirements – building inspectors, permits, offsite services.

22. Site Access.

7. Comply with Consultant's allocation of mobilization areas of site; for field offices and sheds, access, traffic, and parking facilities.

8. During construction coordinate use of site and facilities through Consultant's procedures for intra-project communications: Submittals, reports and records, schedules, coordination of drawings, recommendations, and resolution of ambiguities and conflicts.

9. Comply with instructions of Consultant for use of temporary utilities and construction facilities.

10. Coordinate field engineering and layout work with Consultant.

1.5. On-site Documents

1. Maintain at job site, one (1) copy each of the following:
    1. Contract drawings.
    2. Specifications.
    3. Addenda.
    4. Reviewed shop drawings.
    5. Change orders.
    6. Approved samples.
    7. Site instructions.
    8. Field reviews.
    9. Copies of all permits.
    10. Other modifications to Contract.
    11. Field test reports.
    12. Copy of approved Work schedule.
    13. Manufacturers' installation and application instructions.
    14. Labour conditions and wage schedules.
    15. Accident prevention regulations (WCB) – refer also to Section 01 35 30 – Health and Safety Requirements.

1.6. Schedules

1. Submit preliminary construction progress schedule in accordance with Section 01 32 00 – Construction Progress Documents to Consultant coordinated with Consultant's project schedule.
2. After review, revise and resubmit schedule to comply with revised project schedule.
3. During progress of Work revise and resubmit as directed by Consultant.

1.7. Daily Record

1. From commencement of Work, maintain daily record of Work progress listing all applicable trades; open record to Consultant's review at all times.
2. Daily record to include pertinent data, such as:
    1. Daily weather conditions.
    2. Commencement, progress and completion of various portions of Work.
    3. Date of all site meetings.
    4. Date of visits or inspections by government authorities, inspectors, utility companies and other visitors to the site.
    5. Work force employed.
    6. Contractor or Subcontractor required information.

7. Materials or products causing delay.

8. Actions or events causing delay.

9. Clarifications requested and answers received.

10. Progress photos.

1.8. Construction Progress Meetings

1. During course of Work and two (2) weeks prior to Substantial Performance, schedule progress meetings monthly, and times considered necessary by Consultant or Owner.

2. Representatives of the Owner, Consultants, Contractor (project manager and superintendent), Subcontractors and Suppliers appropriate to the agenda will be in attendance.

3. Notify parties minimum three (3) days prior to meetings.

4. Record minutes of meetings and circulate to attending parties and affected parties not in attendance within three (3) days after meeting.

5. Agenda to include following:

    1. Review, approval of minutes of previous meeting.

    2. Review of Work progress since previous meeting.

    3. Field observations, problems, conflicts.

    4. Problems which impede construction schedule.

    5. Review of off-site fabrication delivery schedules.

    6. Corrective measures and procedures to regain projected schedule.

    7. Revision to construction schedule.

    8. Progress schedule, during succeeding work period.

    9. Review submittal schedules: expedite as required.

    10. Maintenance of quality standards.

    11. Review proposed changes for affect on construction schedule and on completion date.

    12. Field observations, comments and questions.

    13. Review of record documents.

    14. Other business.

1.9. Submittals

1. Make submittal to Consultant for review.

2. Submit preliminary shop drawings, product data and samples in accordance with Section 01 33 00 for review for compliance with Contract Documents, for field dimensions and clearances, for relation to available space, and for relation to Work of other contracts. After review, revise and resubmit for transmittal to Consultant.

3. Submit requests for payment for review, and for transmittal to Consultant.

4. Submit requests for interpretation of Contract Documents, and obtain instructions through Consultant.

5. Process substitutions through Consultant.

6. Process change orders through Consultant.

7. Deliver closeout submittals for review and preliminary inspections, for transmittal to Consultant.

1.10. Coordination Drawings

1. Provide information required by Consultant for preparation of coordination drawings.

2. Review and approve revised drawings for submittal to Consultant.

1.11. Closeout Procedures

1. Notify Consultant when Work is considered ready for Substantial Performance.

2. Accompany Consultant on preliminary inspection to determine items listed for completion or correction.

3. Comply with Consultant's instructions for correction of items of Work listed in executed certificate of Substantial Performance and for access to Owner-occupied areas.

4. Notify Consultant of instructions for completion of items of Work determined in Consultant’s final inspection.

2. PRODUCTS (NOT APPLICABLE)

3. EXECUTION (NOT APPLICABLE)

END OF SECTION

1. GENERAL

1.1. Section Includes

1. Schedule, form, content.
2. Phased construction.
3. Scheduled revisions.
4. Critical path scheduling.

1.2. Schedules Required

1. Submit schedules as follows:
    1. Construction Progress Schedule.
    2. Submittal Schedule for Shop Drawings and Product Data.
    3. Submittal Schedule for Samples.
    4. Submittal Schedule for timeliness of Owner furnished Products.
    5. Product Delivery Schedule.
    6. Cash Allowance Schedule for purchasing Products.
    7. Shutdown or closure activity.

1.3. Format

1. Prepare schedule in form of a horizontal Gantt bar chart.
2. Provide a separate bar for each major item of work, trade or operation.
3. Split horizontally for projected and actual performance.
4. Provide horizontal time scale identifying first workday of each week.
5. Format for listings: chronological order of start of each item of work.
6. Identification of listings: by systems description.
7. Use calendar days as the unit of time measurement (not working days).

1.4. Submission

1. Submit initial format of schedules within fifteen (15) calendar days after award of Contract.
2. Submit schedules in electronic format; forward through e-mail as PDF files.
3. Submit one (1) letter or legal sized opaque reproduction, plus two (2) copies to be retained by Consultant.
4. Consultant will review schedule and return review copy within ten (10) days after receipt.
5. Resubmit finalized schedule within seven (7) days after return of review copy.
6. Submit revised progress schedule with each application for payment.
7. Distribute copies of revised schedule to:

1. Job site office.
2. Subcontractors.
3. Consultant.
4. Owner.
5. Other concerned parties.

8. Instruct recipients to report to Contractor within ten (10) days, any problems anticipated by timetable shown in schedule.

1.5. Critical Path Scheduling

1. Include complete sequence of construction activities.
2. Include dates for commencement and completion of each major element of construction as follows:
    1. Site clearing.
    2. Site utilities.
    3. Foundation Work.
    4. Structural framing.
    5. Special Subcontractor Work.
    6. Equipment Installations.
    7. Finishes.
3. Show projected percentage of completion of each item as of first day of month.
4. Indicate progress of each activity to date of submission schedule.
5. Show changes occurring since previous submission of schedule:
    1. Major changes in scope.
    2. Activities modified since previous submission.
    3. Revised projections of progress and completion.
    4. Other identifiable changes.
6. Provide a narrative report to define:
    1. Problem areas, anticipated delays, and impact on schedule.
    2. Corrective action recommended and its effect.
    3. Effect of changes on schedules of other prime contractors.

1.6. Progress Photographs

1. Sizes and format: digital photos 640 x480 pixel minimum; JPG format.
2. Identification: name of project and date (YYYY.MM.DD).
3. Viewpoints: interior and exterior locations: viewpoints determined by Consultant.

4. Frequency: monthly with progress statement, and at completion of excavation, and foundation and framing and services before concealment and building and as directed by Consultant.

1.7. Video

1. Submit digital format video, as appropriate.

2. Frequency: monthly with progress statement and at completion of excavation and foundation and framing and services before concealment and building or as directed by Consultant.

1.8. Submittals Schedule

1. Include schedule for submitting shop drawings, float time, product data, and samples.

2. Indicate dates for submitting, review time, resubmission time, last date for meeting fabrication schedule.

3. Include dates when submittals and delivery will be required for Owner-furnished products.

4. Include dates when reviewed submittals will be required from Consultant.

5. Forward to Consultant submittals prior to project benchmarks as itemised below. The list is a checklist only and does not relieve Contractor from requirements of other sections:

    1. Provide within seven (7) days of notification of intent to award a contract and prior to commencement of construction:

        1. Performance Bond and Labour and Material Payment Bond each for fifty percent of contract amount.

        2. Construction schedule in triplicate.

        3. Certified copies of Contractor’s insurance policies.

        4. Schedule of Values.

        5. List of site and managerial personnel to be employed on project

    2. Provide prior to making application for first payment and as a condition thereof:

        1. Worker’s Compensation Board letter stating that Contractor and Subcontractor are in good standing.

        2. Copies of permits and fee receipts.

        3. Sample progress claim form, for Consultant approval.

        4. Sample statutory declaration forms and list of corporate signing officers.

        5. Sample submittal schedule.

        6. Shop drawing submittal schedule.

    3. Provide during progress of construction:

        1. Copies of test reports.

        2. Copies of inspection reports issued by authorities.

        3. Copies of permits, licences, certificates and fee receipts.

        4. Shop drawings and samples.

5. All applicable permits (gas, oil, pressure vessels, piping, mechanical, electrical, and similar).

6. Revised construction schedule.

7. Application for payment and associated documentation.

4. Provide prior to Substantial Performance and as a condition thereof:

1. Reconciliation of change orders.

2. Manufacturer's guarantees, warranties, manufacturer's or association's maintenance recommendations, maintenance manuals and operating instructions, where specified.

3. Worker's Compensation Board letter stating that Contractor and Subcontractor are in good standing.

4. Record documents for review.

5. All spare parts and other reserve materials.

6. Mechanical testing, balancing and checking of equipment and systems.

7. Plumbing testing and checking of equipment and systems.

8. Certificate from local authority approving plumbing installation.

9. Certificate from local or provincial authority approving gas/oil installation, venting, and similar.

10. Certificates for cleaning duct systems, chemical cleaning and treatment of piping systems, if applicable.

11. Certificate from local authority approving electrical installation.

12. Occupancy permit from local authority, if applicable.

13. Statutory Declaration, confirming that all Work requirements and conditions have been met for Substantial Performance.

5. Provide at Total Performance and as a condition thereof:

1. Release of liens arising out of Contract.

2. Certification, acceptable to Owner, stating all taxes, GST, EI payments, CPP contributions, duties, royalties and other monies required to be paid by lay or statute have been paid in full.

2. PRODUCTS (NOT APPLICABLE)

3. EXECUTION (NOT APPLICABLE)

END OF SECTION

1. GENERAL

1.1. Section Includes

1. Shop drawings and product data.
2. Samples.
3. Certificates and transcripts.

1.2. References

1. Canadian Construction Documents Committee (CCDC)
    1. CCDC 2 – 2008, Stipulated Price Contract.

1.3. Administrative

1. Submit to Consultant submittals listed for review. Submit with reasonable promptness and in orderly sequence to not cause delay in Work. Failure to submit in ample time is not considered sufficient reason for an extension of Contract Time and no claim for extension due to such default will be allowed.
2. Work affected by submittal shall not proceed until review is complete.
3. Present shop drawings, product data, samples and mock-ups in SI Metric units.
4. Where items or information is not produced in SI Metric units converted values are acceptable.
5. Review submittals prior to submission to Consultant. This review represents that necessary requirements have been determined and verified, or will be, and that each submittal has been checked and co-ordinated with requirements of Work and Contract Documents. Submittals not stamped, signed, dated and identified as to specific project will be returned without being examined and shall be considered rejected.
6. Notify Consultant, in writing at time of submission, identifying deviations from requirements of Contract Documents stating reasons for deviations.
7. Verify field measurements and affected adjacent Work are 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.

1.4. Shop Drawings and Project Data

1. Refer to CCDC 2, GC 3.10.
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. 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 design drawings and specifications.

4. Allow fifteen (15) days for Consultant's review of each submission.

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 prior 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 any revisions other than those requested.

7. Accompany submissions with transmittal letter containing:

    1. Date.

    2. Project title and number.

    3. Contractor's name and address.

    4. Identification and quantity of each shop drawing, product data and sample.

    5. Other pertinent data.

8. Submissions shall include:

    1. Date and revision dates.

    2. Project title and number.

    3. Submittal number as determined by the Contractor, and revision number as applicable.

    4. Name and address of:

        1. Subcontractor.

        2. Supplier.

        3. Manufacturer.

    5. Contractor’s stamp, signed by Contractor's authorized representative certifying approval of submissions, verification of field measurements and compliance with Contract Documents.

    6. Details of appropriate portions of Work as applicable:

        1. Fabrication.

        2. Layout, showing dimensions, including identified field dimensions, and clearances.

        3. Setting or erection details.

        4. Capacities.

        5. Performance characteristics.

        6. Standards.

        7. Operating weight.

        8. Wiring diagrams.

        9. Single line and schematic diagrams.

        10. Relationship to adjacent work.

9. After Consultant’s review, distribute copies.

10. Submit six (6) prints of shop drawings for each requirement requested in specification Sections and as consultant may reasonably request.

11. Submit six (6) 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.

12. Delete information not applicable to project.

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

14. 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, and must be performed before fabrication and installation of Work may proceed.

15. Consider this article to be minimum requirement. Further instruction in any particular specification section governs for that section of the Work.

1.5. 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 prior to proceeding with Work.

6. Make changes in samples that Consultant may require, consistent with Contract Documents.

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

1.6. Mock-ups

1. Erect mock-ups in accordance with 01 45 00 – Quality Control.

1.7. Progress Photographs

1. Submit progress photographs in accordance with Section 01 32 00 – Construction Progress Documentation.

1.8. Certificates and Transcripts

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

2. Submit transcription of insurance immediately after award of Contract.

2. PRODUCTS (NOT APPLICABLE)

3. EXECUTION (NOT APPLICABLE)

END OF SECTION

1. GENERAL

1.1. References

1. Canada Labour Code, Canada Occupational Safety and Health Regulations.
2. Canadian Standards Association (CSA)
    1. CSA S350-M1980, Code of Practice for Safety in Demolition of Structures.
3. Province of British Columbia
    1. Workers Compensation Act, (Occupational Health and Safety) Amendment, B.C. Reg. 185/99.

1.2. Submittals

1. Make submittals 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:
    1. Site specific safety hazard assessment.
    2. Safety and health risk or hazard analysis for site tasks and operation (found in work plan).
3. Submit Construction Safety Checklists after completion.
4. Submit copies of reports or directions issued by Federal and Provincial health and safety inspector.
5. Submit copies of incident and accident reports.
6. Submit to Consultant with Material Safety Data Sheets (MSDS).
7. Personnel training requirements including as follows:
    1. Names of personnel and alternates responsible for site safety and health, hazards present on site, and use of personal protective equipment.
8. Consultant will review Contractor's site-specific Health and Safety Plan and provide comments to Contractor within seven (7) days after receipt of plan. Revise plan as appropriate and resubmit plan to Consultant within seven (7) days after receipt of comments from Consultant.
9. Medical Surveillance: Within seven (7) days after date of Notice to Proceed and prior to mobilization to site, submit certification of medical surveillance for site personnel, and submit additional certifications as personnel are sent to site.
10. .On-site Contingency and Emergency Response Plan: Address standard operating procedures to be implemented during emergency situations.

1.3. Filing of Notice

1. File Notice with Provincial authorities prior to commencement of Work.

1.4. Work Permit

1. Obtain building permit related to project prior to commencement of Work.

1.5. Safety Assessment

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

1.6. Meetings

1. Pre-construction meetings: attend health and safety pre-construction meeting.

1.7. Regulatory Requirements

1. Comply with specified standards and regulations to ensure safe operations at site containing hazardous or toxic materials.

1.8. Project / Site Conditions

1. The site is contaminated and the Township of Ladysmith is currently undergoing the remediation and the abatement of the soil. No work will begin until this is complete and the proper certificate of remediation has been achieved.

1.9. General Requirements

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

2. Relief from or substitution for any portion or provision of minimum Health and Safety Guidelines specified herein or reviewed site-specific Health and Safety Plan must submitted to Consultant in writing. Consultant will respond in writing, either accepting or requesting improvements.

1.10. Responsibility

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

2. Be solely responsible for all safety measures in connection with construction means, methods, techniques, sequences and procedures.

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

1.11. Communication Requirements

1. Comply with Workers Compensation Act, Occupational Health and Safety Regulation, B.C. Reg. 185/99.

2. Provide Consultant with Material Safety Data Sheets (MSDS).

3. Comply with utility company requirements.

1.12. Unforeseen Hazards

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

1.13. Health and Safety Officer

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

    1. Have minimum two (2) years site-related working experience specific to activities associated with construction of this type and scope of project.

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

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

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

5. Be on site during execution of Work and report directly to and be under direction of a Registered Occupational Hygienist or Certified Industrial Hygienist.

1.14. Posted Documents

1. Provide to or obtain from Consultant documents as follow and post on site:

    1. Safety Policy.

    2. Health and Safety Representative.

    3. General Requirements – Constructor's name.

    4. Worker's Compensation Board for Province of British Columbia - Form 82.

    5. Worker's Compensation Board for Province of British Columbia - Regulation 1101.

    6. Ministry of Labour Orders for Province of British Columbia.

    7. Occupational Health and Safety Act for Province of British Columbia.

    8. Material Safety Data Sheets.

    9. Floor Plan.

    10. Notice of Project.

    11. Joint Health and Safety Committee Members.

2. Comply with Provincial general posting requirements.

1.15. Construction Safety Checklists

1. Obtain Construction Safety checklist from Authorities.

2. Review and implement out applicable health and safety checklists provided by Consultant in collaboration with Consultant.

1.16. Correction of Non-compliance

1. Immediately address health and safety non-compliance issues identified by Consultant.

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

3. Consultant may stop Work if non-compliance of health and safety regulations is not corrected.

1.17. Blasting

1. Blasting or other use of explosives is permitted only after receipt of written instruction by Consultant, and authorization by the Owner. Note that the Owner may not authorize blasting; permission should be sought as soon as possible so that alternate arrangements can be made, if required.

2. Do blasting operations in accordance with CSA S350.

1.18. Powder Actuated Devices

1. Use powder actuated devices only after receipt written permission from Consultant.

1.19. 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.

2. Assign responsibility and obligation to Health and Safety Officer to stop or start Work when, at Health and Safety Officer's discretion, it is necessary or advisable for reasons of health or safety. Engineer or Consultant may also stop Work for health and safety considerations.

1.20. Work in Health Facilities

1. Perform all work in accordance with CSA Z317.13.03 entitled “Infection Control During Construction or Renovation of Health Care Facilities.”

2. PRODUCTS (NOT APPLICABLE)

3. EXECUTION (NOT APPLICABLE)

END OF SECTION

1. GENERAL

1.1. Fires

1. Fires and burning of rubbish on site not permitted.

1.2. Disposal of Wastes

1. Do not bury rubbish and waste materials on site.
2. Do not dispose of waste or volatile materials, such as mineral spirits, oil or paint thinner into waterways, storm or sanitary sewers.

1.3. Drainage

1. Provide temporary drainage and pumping as necessary to keep excavations and site free from water.
2. Do not pump water containing suspended materials into waterways, sewer or drainage systems.
3. Control disposal or runoff of water containing suspended materials or other harmful substances in accordance with local authority requirements.

1.4. Site Clearing and Plant Protection

1. Protect trees and plants on site and adjacent properties where indicated.
2. Wrap in burlap, trees and shrubs adjacent to construction work, storage areas and trucking lanes, and encase with protective wood framework from grade level to height of 2 m (6’-8”).
3. Protect roots of designated trees to drip line during excavation and site grading to prevent disturbance or damage. Avoid unnecessary traffic, dumping and storage of materials over root zones.
4. Minimize stripping of topsoil and vegetation.
5. Restrict tree removal to areas indicated or designated by Consultant.

1.5. Work Adjacent to Waterways

1. Do not operate construction equipment in waterways.
2. Do not use waterway beds for borrow material.
3. Do not dump excavated fill, waste material or debris in waterways.
4. Design and construct temporary crossings to minimize erosion to waterways.
5. Do not skid logs or construction materials across waterways.
6. Avoid indicated spawning beds when constructing temporary crossings of waterways.
7. Do not blast under water or within 100 m (300’) of indicated spawning beds.

1.6. Pollution Control

1. Maintain temporary erosion and pollution control features installed under this contract.
2. Control emissions from equipment and plant to local authorities emission requirements.

3. Prevent sandblasting and other extraneous materials from contaminating air beyond application area, by providing temporary enclosures.

4. Cover or wet down dry materials and rubbish to prevent blowing dust and debris. Provide dust control for temporary roads.

2. PRODUCTS (NOT APPLICABLE)

3. EXECUTION (NOT APPLICABLE)

END OF SECTION

1. GENERAL

1.1. Associations

1. AA - Aluminum Association, 900 19th Street N.W., Washington, D.C., U.S.A. 20006 URL http://www.aluminum.org
2. AASHTO - American Association of State Highway and Transportation Officials, 444 N Capitol Street N.W., Suite 249, Washington, D.C., U.S.A. 20001 URL http://www.aashto.org
3. ACEC Association of Consulting Engineers of Canada,130 Albert Street, Ottawa, ON. K1P 5G4 URL http://www.acec.ca
4. AHA - American Hardboard Association, 1210W Northwest Hwy., Palatine, Illinois, U.S.A. 60067 URL: http://www.areat.com
5. AITC - American Institute of Timber Construction, 7012 S. Revere Parkway, Suite 140, Englewood, Colorado, U.S.A. 80112 URL http://www.aitc-glulam.org
6. AMCA - Air Movement and Control Association Inc., 30 West University Drive, Arlington Heights, Illinois, U.S.A. 60004-1893 URL http://www.amca.org
7. ANSI - American National Standards Institute, 11 West 42nd Street, New York, New York, U.S.A. 10036 URL http://www.ansi.org
8. APA - The Engineered Wood Association, P.O. Box 11700, Tacoma, Washington, U.S.A. 98411-0700 URL http://www.apawood.org
9. API - American Petroleum Institute,1220 L St. Northwest, Washington, D.C., U.S.A. 20005-4070 URL http://www.api.org
10. ARI - Air Conditioning and Refrigeration Institute, 4301 North Fairfax Drive, Suite 425, Arlington, Virginia, U.S.A. 22203 URL http://www.ari.org
11. ASHRAE - American Society of Heating, Refrigeration and Air-Conditioning Engineers, 1791 Tullie Circle NE, Atlanta, Georgia, U.S.A. 30329 URL http://www.ashrae.org
12. ASME - American Society of Mechanical Engineers, United Engineering Centre, Three Park Avenue, New York, New York, U.S.A. 10016-5990 URL http://www.asme.org
13. ASPT Association for Asphalt Paving Technologists, 400 Selby Avenue, Suite 1, St. Paul, MN 55102 U.S.A. URL http://www.asphalt.org
14. ASTM - American Society for Testing and Materials, 100 Barr Harbor Drive West, Conshohocken, Pennsylvania 19428-2959 URL http://www.astm.org
15. AWCI - Association of the Wall and Ceiling Industries International, 803 West Broad Street, Suite 600, Falls Church, UA, U.S.A. 22046 URL http://www.awci.org
16. AWMAC - Architectural Woodwork Manufacturers Association of Canada, 516 4 Street West, High River, Alberta T1V 1B6 URL http://www.awmac.com
17. AWPA - American Wire Producer's Association, 6232 Roudsby, Alexandria, VA U.S.A. 22315-5285 URL http://www.awpa.org
18. AWPA - American Wood Preservers' Association, P.O. Box 5690, Grandbury Texas, U.S.A. 76049-0690 URL http://www.awap.com
19. AWS - American Welding Society, 550 N.W. LeJeune Road, Miami, Florida U.S.A. 33126 URL http://www.amweld.org

20. AWWA - American Water Works Association, 6666 W. Quincy Avenue, Denver, Colorado, U.S.A. 80235 URL http://www.awwa.org

21. CCA Canadian Construction Association,75 Albert St., Suite 400 Ottawa, Ontario, K1P 5E7 URL http://www.cca-acc.com

22. CCDC Canadian Construction Documents Committee, Refer to ACEC, CCA, CSC or RAIC

23. CITC Canadian Institute of Timber Construction, 200 Cooper Street, Ottawa, Ontario K2P 0G1

24. CFFM - Canadian Forces Fire Marshal, 101 Colonel By Drive, 8NT MGen George R. Pearkes Bldg., Ottawa, Ontario K1A 0K2

25. CGA - Canadian Gas Association, 20 Eglinton Avenue West, Suite 1305, Toronto, Ontario M4R 1K8 URL http://www.cga.ca

26. CGSB - Canadian General Standards Board, Place du Portage, Phase III, 6B1, 11 Laurier Street, Hull, Quebec K1A 1G6 URL http://w3.pwgsc.gc.ca/cgsb

27. CISC - Canadian Institute of Steel Construction, 201 Consumers Road, Suite 300, Willowdale, Ontario M2J 4G8 URL http://www.buildingweb.com/CISC

28. CLA - Canadian Lumbermen's Association, 27 Goulburn Avenue, Ottawa, Ontario, K1N 8C7 URL http://www.cla.ca.ca

29. CNLA - Canadian Nursery Landscape Association, RR #4, Stn. Main, 7856 Fifth Street, Milton, Ontario. L9T 2X8 URL http://www.canadanursery.com

30. CRCA - Canadian Roofing Contractors Association, 155 Queen Street, Suite 130C, Ottawa, Ontario K1P 6L1 URL http://www.roofingcanada.com

31. CSA - Canadian Standards Association International, 178 Rexdale Blvd., Toronto, Ontario M9W 1R3 URL http://www.csa-international.org

32. CSC - Construction Specifications Canada, 100 Lombard Street, Suite 200, Toronto, Ontario M5C 1M3 URL http://www.csc-dcc.ca

33. CSDFMA - Canadian Steel Door and Frame Manufacturing Association One Yonge Street, Suite 1400, Toronto, Ontario M5E 1J9

34. CSPI - Corrugated Steel Pipe Institute, 201 Consumers Road, Suite 306, Willowdale, Ontario M2J 4G8

35. CSSBI - Canadian Sheet Steel Building Institute, 652 Bishop St. N., Unit 2A, Cambridge, Ontario N3H 4V6 URL http://www.cssbi.ca

36. CUFCA Canadian Urethane Foam Contractor's Association

37. CWC - Canadian Wood Council, 1400 Blair Place, Suite 210, Ottawa, Ontario K1J 9B8 URL http://www.cwc.ca

38. EC - Environment Canada, Conservation and Protection, Ottawa, Ontario KIA 0H3 URL http://www.ec.gc.ca

39. EEMAC - Electrical and Electronic Manufacturers' Association of Canada, 5800 Explorer Drive, Suite 200, Mississauga, Ontario L4W 5K9 URL http://www.electrofed.ca

40. EIMA EIFS Industry Manufacturer's Association, 3000 Corporate Center Drive, Suite 270, Morrow, Georgia U.S.A. 30260 URL http://www.eifsfacts.com

41. FCC - Fire Commissioner of Canada, Place du Portage, Phase II, 165 rue Hotel de Ville, Hull Quebec K1A 0J2 URL http://www.hrdc-drhc.gc.ca

42. IEEE - Institute of Electrical and Electronics Engineers, 345 East 47th Street, New York, New York U.S.A. 10017 URL http://www.ieee.org

43. MPI - The Master Painters Institute, 4090 Graveley Street, Burnaby, BC V5C 3T6 URL http://www.paintinfo.com

44. MSS - Manufacturers Standardization Society of the Valve and Fittings Industry, 127 Park Street, N.E., Vienna, Virginia U.S.A.22180

45. NAAMM - National Association of Architectural Metal Manufacturers, 8 South Michigan Avenue, Suite 1000, Chicago, Illinois U.S.A. 60603 URL http://www.naamm.org

46. NABA - National Air Barrier Association, 400-283 Bannatyne Avenue, Winnipeg, Manitoba R3B 3B2

47. NEMA - National Electrical Manufacturers Association,1300 N. 17th Street, Suite 1847, Rosslyn, Virginia 22209 URL http://www.nema.org

48. NFPA - National Fire Protection Association, 1 Batterymarch Park, P.O. Box 9101Quincy, Massachusetts, U.S.A. 02269-9101 URL http://www.nfpa.org

49. NFSA - National Fire Sprinkler Association, 40 Jon Barrett Road, P.O. Box 1000, Patterson, New York, U.S.A. 12563 URL http://www.nfsa.org

50. NHLA - National Hardwood Lumber Association, P.O. Box 34518, Memphis, Tennessee, U.S.A 38184- 0518 URL http://www.natlhardwood.org

51. NLGA - National Lumber Grades Authority, 406 First Capital Place, New Westminster, B.C. V3M 6G2

52. NRC - National Research Council, Montreal Road, Ottawa, Ontario K1A 0S2 URL http://www.nrc.gc.ca

53. NSPE National Society of Professional Engineers, 1420 King Street, Alexandria, VA U.S.A. 22314-2794 URL http://www.nspe.org

54. PCI - Prestressed Concrete Institute, 209 W. Jackson Blvd., Suite 500, Chicago, Illinois, U.S.A. 60606 URL http://www.pci.org

55. PEI - Porcelain Enamel Institute, P.O. Box 158541, 4004 Hillsboro Pike, Suite 224-B Nashville, TN, U.S.A. 37215 URL http://www.porecelainenamel.com

56. QPL - Qualification Program List, c/o Canadian General Standards Board, Place du Portage, Phase III, 6B1, 11 Laurier Street, Hull, Quebec K1A 1G6 URL http://www.pwgsc.gc.ca/cgsb

57. RAIC Royal Architectural Institute of Canada, 55 Murray Street, Suite 330, Ottawa, Ontario, K1N 5M3 URL http://www.raic.org

58. SCC - Standards Council of Canada, 200 Albert Street, Suite 2000, Ottawa, Ontario K1P 6N7 URL http://www.scc.ca

59. SSPC - The Society for Protective Coatings, 40 24th Street, Pittsburgh, Pennsylvania 15222- 4656 URL http://www.sspc.org

60. TPI - Truss Plate Institute, 583 D'Onofrio Drive, Suite 200, Madison, WI, U.S.A. 53719 URL http://www.tpinst.org

61. TTMAC - Terrazzo, Tile and Marble Association of Canada, 30 Capston Gate, Unit 5 Concord, Ontario L4K 3E8 URL http://www.ttmac.com

62. UL – Underwriters' Laboratories, 333 Pfingsten Road, Northbrook, Illinois, U.S.A. 60062 URL http://www.ul.com

63. ULC – Underwriters' Laboratories of Canada, 7 Crouse Road, Toronto, Ontario M1R 3A9 URL http://www.ulc.ca

64. WCB – Worker's Compensation Board of British Columbia, PO Box 5350 Stn Terminal, Vancouver BC V6B 5L5 URL http://www.worksafebc.com

1.2. Reference Standards.

1. Within the text of the specifications, reference may be made to the following standards:

AA - Aluminum Association

ACI - American Concrete Institute

ACEC - Association of Consulting Engineers of Canada

AISC - American Institute of Steel Construction

ANSI - American National Standards Institute

API - American Petroleum Institute

ASPT - Association for Asphalt Paving Technologists

ASME - American Society of Mechanical Engineers

ASTM - American Society for Testing and Materials

AWMAC - Architectural Woodwork Manufacturers Association of Canada

AWPA - American Wire Producers Association

AWS - American Welding Society

BCBC - British Columbia Building Code

CCA - Canadian Construction Association

CCDC - Canadian Construction Documents Committee

CCME - Canadian Council of Ministers of the Environment

CEC - Canadian Electrical Code (published by CSA)

CEMA - Canadian Electrical Manufacturer's Association

CEPA - Canadian Environmental Protection Act

CGSB - Canadian General Standards Board

CISC - Canadian Institute of Steel Construction

CLA - Canadian Lumberman's Association

CPCA - Canadian Painting Contractors' Association

CPCI - Canadian Prestressed Concrete Institute

CPMA - Canadian Paint Manufacturers Association

CRCA - Canadian Roofing Contractors Association

CSA - Canadian Standards Association

CSC - Construction Specifications Canada

CSSBI - Canadian Sheet Steel Building Institute

ECP - Environmental Choice Program

EIMA - EIFS Industry Manufacturer's Association

EPA - Environmental Protection Agency

FGMA - Flat Glass Manufacturers Association

FM - Factory Mutual Engineering Corporation

GRI - Geosynthetic Research Institute

ICEA - Insulated Cable Engineers Association

IEEE - Institute of Electrical and Electronic Engineers

IPCEA - Insulated Power Cable Engineers Association

LSGA - Laminators Safety Glass Association

MSS - Manufacturers Standardization Society of the Valve and Fittings Industry

NAAMM - National Association of Architectural Metal Manufacturers

NBC - National Building Code

NEMA - National Electrical Manufacturers Association

NFPA - National Fire Protection Association

NHLA - National Hardwood Lumber Association

NLGA - National Lumber Grades Authority

NSPE - National Society of Professional Engineers

RAIC - Royal Architectural Institute of Canada

SSPC - Steel Structures Painting Council

TTMAC - Terrazzo, Tile and Marble Association of Canada

ULC – Underwriters' Laboratories of Canada

WCB – Worker's Compensation Board of British Columbia

2. PRODUCTS (NOT APPLICABLE)

3. EXECUTION (NOT APPLICABLE)

END OF SECTION

1. GENERAL

1.1. Section Includes

1. Inspection and testing, administrative and enforcement requirements.
2. Tests and mix designs.
3. Mock-ups.
4. Mill tests.
5. Equipment and system adjust and balance.

1.2. References

1. Canadian Construction Documents Committee (CCDC)
    1. CCDC 2 – 2008, Stipulated Price Contract.

1.3. Inspection and Review

1. Refer to CCDC 2, GC 2.3.
2. Allow Owner and Consultant access to Work. If part of Work is in preparation at locations other than Place of Work, allow access to such Work whenever it is in progress.
3. Give timely notice, in any case not less than forty-eight (48) hours, requesting review if Work is designated for special tests, inspections or approvals by Consultant instructions, or law of Place of Work.
4. If Contractor covers or permits to be covered Work that has been designated for special tests, inspections or approvals before such is made, uncover such Work, have inspections or tests satisfactorily completed and make good such Work.
5. Consultant may order any part of Work to be examined if Work is suspected to be not in accordance with Contract Documents. If, upon examination such work is found not in accordance with Contract Documents, correct such Work and pay cost of examination and correction. If such Work is found in accordance with Contract Documents, Owner shall pay cost of examination and replacement.
6. Unless otherwise noted in individual Sections, the following is a list of independent testing and inspections required for the project, see also Structural Specifications:
    1. Compaction testing of backfill road subgrade, underslab fill, service trenching.
    2. Asphalt mix and testing.
    3. Concrete mix design.
    4. Concrete testing.
    5. Masonry veneer wall mock-up inspection.
    6. Roofing inspection.
    7. Window pre-installation lab test.
    8. Window mock-up inspection.
    9. Window field test for water penetration.

10. Painting Inspection.

1.4. Independent Inspection Agencies

1. Independent Inspection/Testing Agencies will be engaged by Owner for purpose of inspecting and/or testing portions of Work. Cost of such services will be borne by Owner.

2. Allocated costs: to Section 01 21 00 – Allowances.

3. Provide access for equipment required for executing inspection and testing by appointed agencies.

4. Employment of inspection/testing agencies does not relax responsibility to perform Work in accordance with Contract Documents.

5. If defects are revealed during inspection and/or testing, appointed agency will request additional inspection and/or testing to ascertain full degree of defect. Correct defect and irregularities as advised by Consultant at no cost to Owner. Pay costs for retesting and re-inspection.

6. Submit within fourteen (14) calendar days from Contract award a list of proposed independent testing agencies for review and approval by the Owne and, Consultant.

7. Refer to individual section for specific inspection requirements.

1.5. Access to Work

1. Allow inspection/testing agencies access to Work, off site manufacturing and fabrication plants.

2. Co-operate to provide reasonable facilities for such access.

1.6. Procedures

1. Notify appropriate agency in advance of requirement for tests, in order that attendance arrangements can be made.

2. Submit samples and/or materials required for testing, as specifically requested in specifications. Submit with reasonable promptness and in an orderly sequence so as not to cause delay in Work.

3. Provide labour and facilities to obtain and handle samples and materials on site. Provide sufficient space to store and cure test samples.

1.7. Defective Work

1. Refer to CCDC, GC 2.4.

2. Remove defective Work, whether result of poor workmanship, use of defective products or damage and whether incorporated in Work or not, which has been rejected by Consultant as failing to conform to Contract Documents. Replace or re-execute in accordance with Contract Documents.

3. Make good other Contractor’s work damaged by such removals or replacements promptly.

4. If in opinion of Consultant it is not expedient to correct defective Work or Work not performed in accordance with Contract Documents, Owner may deduct from Contract Price difference in value between Work performed and that called for by Contract Documents, amount of which shall be determined by Consultant.

1.8. Reports

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

2. Provide copies to Subcontractor of work being inspected or tested and manufacturer or fabricator of material being inspected or tested.

1.9. Tests and Mix Designs

1. Furnish test results and mix designs as may be requested.

2. The cost of tests and mix designs beyond those called for in Contract Documents or beyond those required by law of Place of Work shall be appraised by Engineer or Consultant and may be authorized as recoverable.

1.10. Mock-ups

1. Prepare mock-ups for Work specifically requested in specifications. Include for Work of all Sections required to provide mock-ups.

2. Construct in all locations acceptable to Consultant as specified in specific Section.

3. Prepare mock-ups for Consultant's review with reasonable promptness and in an orderly sequence, so as not to cause any delay in Work.

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

5. If requested, Consultant will assist in preparing a schedule fixing dates for preparation. Indicate mock-up inspections on the construction schedule. Coordinate with regular site meetings if possible. Inform Consultant at least two days in advance of mock-up inspections.

6. Specification section identifies whether mock-up may remain as part of Work or if it is to be removed and when.

1.11. Mill Tests

1. Submit mill test certificates as required of specification Sections.

1.12. Equipment and Systems

1. Submit adjustment and balancing reports for mechanical, electrical and building equipment systems.

2. Refer to mechanical and electrical sections for definitive requirements.

2. PRODUCTS (NOT APPLICABLE)

3. EXECUTION (NOT APPLICABLE)

END OF SECTION

1. GENERAL

1.1. Section Includes

1. Temporary utilities.

1.2. Installation and Removal

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

1.3. Dewatering

1. Provide temporary drainage and pumping facilities to keep excavations and site free from standing water.
2. Discharging drainage water into municipal sewers without written approval from authority having jurisdiction is not permitted.
3. Discharging water containing silt in suspension into sewage lines is not permitted.

1.4. Water Supply

1. Provide continuous supply of potable water for construction use.
2. Arrange for connection with appropriate utility company and pay all costs for installation, maintenance and removal.
3. Pay for utility charges at prevailing rates.
4. Provide necessary piping, connections, valves, hoses and similar apparatus and make same available to trades throughout construction.

1.5. Temporary Heating and Ventilation

1. Provide temporary heating required during construction period, including attendance, maintenance and fuel.
2. Construction heaters used inside building must be vented to outside or be non-flameless type. Solid fuel salamanders are not permitted.
3. Provide temporary heat and ventilation in enclosed areas as required to:
    1. Facilitate progress of Work.
    2. Protect Work and products against dampness and cold.
    3. Prevent moisture condensation on surfaces.
    4. Provide ambient temperatures and humidity levels for storage, installation and curing of materials.
    5. Provide adequate ventilation to meet health regulations for safe working environment.
4. Maintain temperatures of minimum 10°C (50°F) in areas where construction is in progress.
5. Ventilating:
    1. Prevent accumulations of dust, fumes, mists, vapours or gases in areas occupied during construction.

2. Provide local exhaust ventilation to prevent harmful accumulation of hazardous substances into atmosphere of occupied areas.

3. Dispose of exhaust materials in manner that will not result in harmful exposure to persons.

4. Ventilate storage spaces containing hazardous or volatile materials.

5. Ventilate temporary sanitary facilities.

6. Continue operation of ventilation and exhaust system for time after cessation of work process to assure removal of harmful contaminants.

6. Permanent heating system of building may not be used when available. Be responsible for damage to heating system if use is permitted.

7. Ensure Date of Substantial Performance and Warranties for heating system do not commence until entire system is in as near original condition as possible and is certified by Engineer.

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:

1. Conform with applicable codes and standards.

2. Enforce safe practices.

3. Prevent abuse of services.

4. Prevent damage to finishes.

5. Vent direct-fired combustion units to outside.

10. Be responsible for damage to Work due to failure in providing adequate heat and protection during construction.

1.6. Temporary Power and Light

1. Provide and pay for temporary power during construction for temporary lighting and operating of power tools, to a maximum supply of 230 volts, 30 amps.

2. Arrange for connection with appropriate utility company. Pay all costs for installation, maintenance and removal.

3. Temporary power for electric cranes and other equipment requiring in excess of above is responsibility of Contractor.

4. Provide and maintain temporary lighting throughout project. Ensure level of illumination on all floors and stairs is not less than 162 lx.

5. Electrical power and lighting systems installed under this Contract may be used for construction requirements only with prior approval of Engineer provided that guarantees are not affected. Make good damage to electrical system caused by use under this Contract. Replace lamps that have been used for more than three (3) months.

1.7. Temporary Communication Facilities

1. Provide and pay for temporary telephone, fax, data hook up, line(s) and equipment necessary for own use and use of Consultants.

1.8. 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.

2. Take precautions to eliminate fire hazards and instruct Superintendent to make periodic inspections to ensure proper preventative measures are complied with by all personnel on site.

3. Store paint- or oil-covered rags in metal containers. Remove rubbish from site daily.

4. Comply with provincial and municipal regulations and fire safety requirements during construction.

5. Provide additional fire safety measures to protect existing and constructed facilities where welding or torch cutting is required to construct the Work. Provide a suitable fire extinguisher and readily available water supply immediately adjacent to all welding and torch cutting operations.

6. Take precautions to prevent fire by spontaneous combustion.

7. Erect “No Smoking” signs where volatile fumes or liquids are present.

8. Burning rubbish and construction waste materials is not permitted on site.

2. PRODUCTS (NOT APPLICABLE)

3. EXECUTION (NOT APPLICABLE)

END OF SECTION

1. GENERAL

1.1. Section Includes

1. Construction aids.
2. Office and sheds.
3. Parking.
4. Project identification.

1.2. References

1. Canadian Construction Documents Committee (CCDC)
    1. CCDC 2 – 2008, Stipulated Price Contract.

1.3. Installation and Removal

1. Provide construction facilities in order to execute work expeditiously.
2. Remove from site all such work after use.

1.4. Scaffolding

1. Provide and maintain scaffolding, ramps, ladders, swing staging, platforms, and temporary stairs; repair to new conditions any damage to building or other finishes after scaffolding has been removed.
2. Provide rigid, secure, and constructed scaffolding and staging to ensure proper safety for workers, erected and maintained in compliance with Worker's Compensation Board of British Columbia regulations.

1.5. Hoisting

1. Provide, operate and maintain hoists and cranes required for moving of workers, materials and equipment. Make financial arrangements with Subcontractors for use thereof.
2. Hoists and cranes shall be operated by qualified operator.

1.6. Use of the Work

1. Refer to CCDC 2, GC 3.12.
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 a weight or force that will endanger the Work.

1.7. Construction Parking and Site Access

1. Parking will be permitted on site provided it does not disrupt performance of Work.
2. Provide and maintain adequate access to project site; maintain sidewalk crossings, ramps and construction walkways as may be required for access to Work.
3. Build and maintain temporary roads where indicated and provide snow removal during period of Work.

4. If authorized to use existing roads for access to project site, maintain such roads for duration of Contract and make good damage resulting from Contractors' use of roads; comply with traffic restrictions of local authorities having jurisdiction.

5. Maintain access for fire trucks to existing facilities during construction to satisfaction of local authorities having jurisdiction.

1.8. Security

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

2. Subcontractors to ensure security of their own equipment, materials and work, in co-operation with Contractor.

3. Designate areas on site to be used as temporary lock-fast stores.

4. Loss or damage to materials, equipment or property of Contractor or Subcontractors is not the responsibility of the Consultants, Owner, or their representatives.

1.9. Offices

1. Provide office heated to 22°C (72°F), lighted 750 lx and ventilated, clean and tidy, of sufficient size to accommodate site meetings and furnished with drawing lay-down table, meeting table and chairs.

2. Provide a clearly marked and fully stocked first-aid case in a readily available location.

3. Subcontractors may provide their own offices as necessary. Direct location of these offices.

1.10. Equipment, Materials and Tools Storage

1. Provide and maintain, in a 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 a manner to cause least interference with work activities.

1.11. Sanitary Facilities

1. Provide sanitary facilities for work force in accordance with governing regulations and ordinances.

2. Post notices and take such precautions as required by local health authorities. Keep area and premises in sanitary condition.

1.12. Construction Signage

SPEC NOTE: A detail drawing may be added to end of this Section illustrating sign, its wording, type of lettering, colours, etc.

1. Provide and erect, within three (3) weeks of signing Contract, a project sign in a location designated by Consultant.

2. Construction sign 1.2 x 2.4 m, of wood frame and plywood construction painted with exhibit lettering produced by a professional sign painter.

3. Indicate on sign, name of Owner, Consultants and Contractor, of a design style established by Consultant.

4. No other signs or advertisements, other than warning signs, are permitted on site.

5. Locate project identification sign as directed by Consultant and construct as follows:

1. Build concrete foundation, erect framework, and attach signboard to framing.

2. Paint all surfaces of signboard and framing with one coat primer and two coats enamel. Colour white on signboard face, black on other surfaces.

3. Apply vinyl sign face overlay to painted signboard face in accordance with installation instruction supplied.

6. Direct requests for approval to erect a Consultant/Contractor signboard to Consultant. For consideration general appearance of Consultant/Contractor signboard must conform to project identification site sign. Wording shall be in both official languages.

7. Signs and notices for safety and instruction shall be in both official languages. Graphic symbols shall conform to CAN3-Z321.

8. 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.

2. PRODUCTS (NOT APPLICABLE)

3. EXECUTION (NOT APPLICABLE)

END OF SECTION

1. GENERAL

1.1. Section Includes

1. Barriers.
2. Environmental Controls.
3. Traffic Controls.
4. Fire Routes.

1.2. Installation and Removal

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

1.3. Hoarding

1. Erect temporary site enclosures using 38 x 89 mm (2x4) construction grade lumber framing at 600 mm (2'-0") centres and 1200 x 2400 x 13 mm (4'-0" x 8'-0" x 1/2") exterior grade fir plywood to CSA O121. Apply plywood panels vertically flush and butt jointed.
    1. Provide lockable truck entrance gate(s) and at least one pedestrian door as directed and conforming to applicable traffic restrictions on adjacent streets. Equip gates with locks and keys.
    2. Paint public side of site enclosure in selected colours with one coat primer to CGSB 1.189M and one coat exterior paint to CGSB 1.59. Maintain public side of enclosure in clean condition.
2. Erect temporary site enclosure using new 1.8 m (6'-0") high rigid wire fencing to rolled steel "T" bar fence posts spaced at 1.8 m (6'-0") on centre. Provide one lockable truck gate. Maintain fence in good repair.
3. Erect and maintain pedestrian walkways including roof and side covers, complete with signs and electrical lighting as required by law.
4. Provide barriers around trees and plants designated to remain. Protect from damage by equipment and construction procedures.
5. Comply with all local ordinances and by-laws for specific requirements of site enclosures.

1.4. Guard Rails and Barricades

1. Provide secure, rigid guardrails and barricades around deep excavations, open shafts, open stairwells, open edges of floors and roofs, and other areas where change in elevation is greater than 600 mm (2'-0").
2. Provide as required by governing authorities.

1.5. Weather Enclosures

1. Provide weather tight closures to unfinished door and window openings, tops of shafts and other openings in floors and roofs.
2. Close off floor areas where walls are not finished; seal off other openings; enclose building interior work for temporary heat.
3. Design enclosures to withstand wind pressure and snow loading.

1.6. Dust Tight Screens

1. Provide dust tight screens or 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.

1.7. Access to Site

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

1.8. 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 the public.

1.9. Fire Routes

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

1.10. 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.

1.11. Protection of Building Finishes

1. Provide protection for finished and partially finished building finishes and equipment during performance of Work; establish suitability of protection with each trade based on best practices.

2. Provide necessary screens, covers, and hoardings.

3. Confirm with Consultant locations and installation schedule three (3) days prior to installation.

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

2. PRODUCTS (NOT APPLICABLE)

3. EXECUTION (NOT APPLICABLE)

END OF SECTION

1. GENERAL

1.1. Section Includes

1. Product quality, availability, storage, handling, protection, and transportation.
2. Manufacturer's instructions.
3. Quality of Work, coordination and fastenings.
4. Existing facilities.

1.2. Reference Standards

1. Canadian Construction Documents Committee (CCDC)
    1. CCDC 2 – 2008, Stipulated Price Contract.
2. Within text of specifications, reference may be made to reference standards contained in Section 01 42 00 – References.
3. Conform to these standards, in whole or in part as specifically requested in specifications.
4. If there is question as to whether any product or system is in conformance with applicable standards, Engineer or Consultant reserves right to have such products or systems tested to prove or disprove conformance.
5. The cost for such testing will be borne by Owner in event of conformance with Contract Documents or by Contractor in event of non-conformance.
6. Conform to latest date of issue of referenced standards in effect on date of submission of Bids, except where specific date or issue is specifically noted.

1.3. Labour and Products

1. Refer to CCDC 2, GC 3.8.
2. Products, materials, equipment and articles (referred to as products throughout specifications) incorporated in Work shall be new, not damaged or defective, and of best quality (compatible with specifications) 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 any dispute 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.

1.4. Availability

1. Immediately upon signing Contract, review product delivery requirements and anticipate foreseeable supply delays for any 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.

1.5. 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 and other materials susceptible to damage by moisture on flat, solid supports and keep clear of ground. Slope to shed moisture.

7. 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.

8. Remove and replace damaged products at own expense and to satisfaction of Consultant.

9. Touch-up damaged factory-finished surfaces to Consultant's satisfaction. Use touch-up materials to match original. Do not paint over nameplates.

1.6. 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. Unload, handle and store such products.

1.7. 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 may 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.

1.8. 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. Consultant 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.

1.9. Co-ordination

1. Ensure cooperation of workers in laying out Work. Maintain efficient and continuous supervision.

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

1.10. 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.

1.11. Remedial Work

1. Refer to CCDC 2, GC 3.12 and Section 01 73 00 – Execution.

2. Perform remedial work required to repair or replace parts or portions of Work identified as defective or unacceptable. Coordinate 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.

1.12. Location of Fixtures

1. Consider location of fixtures, outlets, and mechanical and electrical items indicated as approximate, unless specifically dimensioned or referenced by dimensions; align and/or group fixtures as shown on drawings, especially but not limited to reflected ceiling plans.

2. Inform Consultant of conflicting installation, or where doubt exists to fixture installation location. Install as directed.

3. Perform a walkthrough after device boxes have been installed but prior to running plumbing or electrical services with the Architect and Owner present to confirm locations.

1.13. 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.

1.14. 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.

1.15. Protection of Work in Progress

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

1.16. 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 and pedestrian and vehicular traffic.

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.

2. PRODUCTS (NOT APPLICABLE)

3. EXECUTION (NOT APPLICABLE)

END OF SECTION

1. GENERAL

1.1. Section includes

1. Field engineering survey services to measure and stake site.
2. Survey services to establish and confirm inverts for Work.
3. Recording of subsurface conditions found.

1.2. References

1. Canadian Construction Documents Committee (CCDC)
    1. CCDC 2 – 2008, Stipulated Price Contract.
2. Owner's identification of existing survey control points and property limits.

1.3. Qualifications of Surveyor

1. Qualified registered land surveyor, licensed to practise in Place of Work, acceptable to Consultant.

1.4. Survey Reference Points

1. Existing base horizontal and vertical control points are designated on drawings.
2. Locate, confirm and protect control points prior to starting site work. Preserve permanent reference points during construction.
3. Make no changes or relocations without prior written notice to Consultant.
4. Report to Consultant when reference point is lost or destroyed, or requires relocation because of necessary changes in grades or locations.
5. Require surveyor to replace control points in accordance with original survey control.

1.5. Survey Requirements

1. Establish two (2) permanent bench marks on site, referenced to established bench marks by survey control points. Record locations, with horizontal and vertical data in Project Record Documents.
2. Establish lines and levels, locate and lay out, by instrumentation.
3. Stake for grading, fill and topsoil placement and major landscaping features.
4. Stake slopes and berms.
5. Establish pipe invert elevations.
6. Stake batter boards for foundations.
7. Establish foundation column locations (where applicable) and floor elevations.
8. Establish lines and levels for mechanical and electrical work.

1.6. Existing Services

1. Refer to Section 01 14 00 – Work Restrictions for restrictions and approvals regarding existing services.

2. Before commencing Work, establish location and extent of service lines in area of Work and in existing Right of Ways, and notify Engineer of findings.

3. Remove abandoned service lines within 2 m (6'-8") of structures. Cap or otherwise seal lines at cut-off points as directed by Authority Having Jurisdiction. Inform Consultant of location.

1.7. Location of Equipment and Fixtures

1. Location of equipment, fixtures and outlets indicated or specified are to be considered as approximate, unless specifically dimensioned or referenced by dimensions.

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

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

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

1.8. Records

1. Maintain a complete, accurate log of control and survey work as it progresses.

2. On completion of foundations and major site improvements, prepare a certified survey showing dimensions, locations, angles and elevations of Work.

3. Record locations of maintained, re-routed, capped off and abandoned service lines.

1.9. Submittals

1. Submit name and address of Surveyor to Consultant.

2. On request of Consultant, submit documentation to verify accuracy of field engineering work.

3. Submit certificate signed by surveyor certifying and noting those elevations and locations of completed Work that conform and do not conform with Contract Documents.

4. Provide three (3) copies of Certificate of Non-Encroachment carried out by BCLS certifying completed structures lie wholly within property boundaries and setbacks.

1.10. Subsurface Conditions

1. Refer to CCDC 2, GC 6.4.

2. Promptly notify Consultant in writing if subsurface conditions at Place of Work differ materially from those indicated in Contract Documents, or a reasonable assumption of probable conditions based thereon.

3. After prompt investigation, should Consultant determine that conditions do differ materially, instructions will be issued for changes in Work as provided in CCDC 2, GC 6.1 Changes, 6.2 Change Order, and 6.3 Change Directive.

2. PRODUCTS (NOT APPLICABLE)

3. EXECUTION (NOT APPLICABLE)

END OF SECTION

1. GENERAL

1.1. Section Includes

1. Requirements and limitations for cutting and patching the Work. Refer to individual product Sections regarding cutting and patching incidental to work of section. Advance notification to other sections required.

1.2. Submittals

1. Submit written request in advance of cutting or alteration that affects:
    1. Structural integrity of any element of Project.
    2. Integrity of weather-exposed or moisture-resistant elements.
    3. Efficiency, maintenance, or safety of any operational element.
    4. Visual qualities of sight-exposed elements.
    5. Work of Owner or separate contractor.
2. Include in request:
    1. Identification of Project.
    2. Location and description of affected Work.
    3. Statement on necessity for cutting or alteration.
    4. Description of proposed Work, and products to be used.
    5. Alternatives to cutting and patching.
    6. Effect on Work of Owner or separate contractor.
    7. Written permission of affected separate contractor.
    8. Date and time work will be executed.

1.3. Materials

1. Required for original installation.
2. Change in Materials: Submit request for substitution in accordance with Section 01 33 00 – Submittal Procedures.

1.4. Preparation

1. Inspect existing conditions, including elements subject to damage or movement during cutting and patching.
2. After uncovering, inspect conditions affecting performance of Work.
3. Beginning of cutting or patching means acceptance of existing conditions.
4. Provide supports to assure structural integrity of surroundings; provide devices and methods to protect other portions of project from damage.
5. Provide protection from elements for areas which may be exposed by uncovering work; maintain excavations free of water.

1.5. Execution

1. Execute cutting, fitting, and patching, including excavation and fill, to complete Work and make Work fit properly.
2. Fit several parts together, to integrate with other Work.
3. Uncover Work to install ill-timed Work.
4. Remove and replace defective and non-conforming Work.
5. Remove samples of installed Work for testing, as specified.
6. Provide openings in non-structural elements of Work for penetrations of mechanical and electrical Work.
7. Execute Work by methods to avoid damage to other Work, and which will provide proper surfaces to receive patching and finishing.
8. Employ original installer to perform cutting and patching for weather-exposed and moisture-resistant elements, and sight-exposed surfaces.
9. Cut rigid materials using masonry saw or core drill. Pneumatic or impact tools not allowed on masonry work without prior approval.
10. Restore work with new products in accordance with requirements of Contract Documents.
11. Fit Work airtight to pipes, sleeves, ducts, conduit, and other penetrations through surfaces.
12. At penetration of fire rated wall, ceiling, or floor construction, completely seal voids with firestopping material, full thickness of the construction element.
13. Refinish surfaces to match adjacent finishes for continuous surfaces refinish to nearest intersection; for an assembly, refinish entire unit.
14. Conceal pipes, ducts and wiring in floor, wall and ceiling construction of finished areas except where indicated otherwise.

2. PRODUCTS (NOT APPLICABLE)

3. EXECUTION (NOT APPLICABLE)

END OF SECTION

1. GENERAL

1.1. Section Includes

1. Progressive cleaning.
2. Final cleaning.

1.2. Reference Standards

1. Canadian Construction Documents Committee (CCDC)
    1. CCDC 2 – 2008, Stipulated Price Contract.

1.3. Project Cleanliness

1. Maintain Work in tidy condition, free from accumulation of waste products and debris, other than that caused by Owner or other Contractors.
2. Remove waste materials from site at regularly scheduled times or dispose of as directed by Consultant. Do not burn waste materials on site.
3. Clear snow and ice from access to building, bank/pile snow in designated areas only or remove from site.
4. Make arrangements with and obtain permits from authorities having jurisdiction for disposal of waste and debris.
5. Provide on-site containers for collection of waste materials and debris.
6. Provide and use clearly marked separate bins for recycling. Refer to Section 01 74 19 – Construction Waste Management and Disposal.
7. Remove waste material and debris from site and deposit in waste container at end of each working day.
8. Dispose of waste materials and debris off site.
9. Clean interior areas prior to start of finish work, and maintain areas free of dust and other contaminants during finishing operations.
10. Store volatile waste in covered metal containers, and remove from premises at end of each working day.
11. Provide adequate ventilation during use of volatile or noxious substances. Use of building ventilation systems is not permitted for this purpose.
12. Use only cleaning materials recommended by manufacturer of surface to be cleaned, and as recommended by cleaning material manufacturer.
13. Schedule cleaning operations so that resulting dust, debris and other contaminants will not fall on wet, newly painted surfaces nor contaminate building systems.
14. Ensure cleaning of work areas, surfaces and materials by each trade, ready for successive trades to continue their work.

1.4. Final Cleaning

1. Refer to CCDC 2, GC 3.13.

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 other than OR including that caused by Owner or other Contractors.

6. Remove waste materials from site at regularly scheduled times. Do not burn waste materials on site.

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, floors and other visible surfaces.

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

11. Vacuum clean and dust building interiors, behind grilles, louvers 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 a 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.

2. PRODUCTS (NOT APPLICABLE)

3. EXECUTION (NOT APPLICABLE)

END OF SECTION

1. GENERAL

1.1. Related Documents

1. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 1 Specification Sections, apply to this Section.

1.2. Summary

1. Section includes administrative and procedural requirements for the following:
    1. Salvaging nonhazardous demolition waste.
    2. Disposing of nonhazardous demolition and construction waste.

1.3. Definitions

1. Construction Waste: Building and site improvement materials and other solid waste resulting from construction, remodeling, renovation, or repair operations. Construction waste includes packaging.
2. Demolition Waste: Building and site improvement materials resulting from demolition or selective demolition operations.
3. Disposal: Removal off-site of demolition and construction waste and subsequent sale, recycling, reuse, or deposit in landfill or incinerator acceptable to authorities having jurisdiction.
4. Recycle: Recovery of demolition or construction waste for subsequent processing in preparation for reuse.
5. Salvage: Recovery of demolition or construction waste and subsequent sale or reuse in another facility.
6. Salvage and Reuse: Recovery of demolition or construction waste and subsequent incorporation into the Work.

1.4. Performance Requirements

1. General: Facilitate recycling and salvage of materials as required.

1.5. Information Submittals

1. Recycling and Processing Facility Records: Indicate receipt and acceptance of recyclable waste by recycling and processing facilities licensed to accept them. Include manifests, weight tickets, receipts, and invoices.
2. Landfill and Incinerator Disposal Records: Indicate receipt and acceptance of waste by landfills and incinerator facilities licensed to accept them. Include manifests, weight tickets, receipts, and invoices.

1.6. Quality Assurance

1. Regulatory Requirements: Comply with hauling and disposal regulations of authorities having jurisdiction.

2. PRODUCTS

2.1. Not used.

3. EXECUTION

3.1. Plan Implementation

1. General: Implement approved waste management plan. Provide handling, containers, storage, signage, transportation, and other items as required to implement waste management plan during the entire duration of the Contract.
    1. Comply with operation, termination, and removal requirements in Section 01 52 00 – Construction Facilities and Section 01 56 00 – Temporary Barriers.
2. Training: Train workers, subcontractors, and suppliers on proper waste management procedures, as appropriate for the Work occurring at the Project sites.
3. Site Access and Temporary Controls: Conduct waste management operations to ensure minimum interference with roads, streets, walks, walkways, plant structures and equipment and other adjacent occupied and used facilities.
    1. Comply with Section 01 52 00 – Construction Facilities and Section 01 56 00 – Temporary Barriers for controlling dust and dirt, environmental protection, and noise control.

3.2. Salvaging Demolition Waste

1. Salvaged Items for Sale: Not permitted on Project sites.
2. Salvaged Items for Owner's Use: Salvage items for Owner's use and handle as follows:
    1. Clean salvaged items.
    2. Pack or crate items after cleaning. Identify contents of containers with label indicating elements, date of removal, quantity, and location where removed.
    3. Store items in a secure area until delivery to Owner.
    4. Transport items to Owner's storage area designated by Owner.
    5. Protect items from damage during transport and storage.
3. Equipment: Drain tanks, piping, and fixtures. Seal openings with caps or plugs. Protect equipment from exposure to weather.

3.3. Recycling Demolition Waste, General

1. Recycling Incentives: Revenues, savings, rebates, tax credits, and other incentives received for recycling waste materials shall accrue to Contractor.
2. Preparation of Waste: Prepare and maintain recyclable waste materials according to recycling or reuse facility requirements. Maintain materials free of dirt, adhesives, solvents, petroleum contamination, and other substances deleterious to the recycling process.
3. Procedures: Separate recyclable waste from other waste materials, trash, and debris. Separate recyclable waste by type at Project sites to the maximum extent practical according to approved construction waste management plan.
    1. Provide appropriately marked containers or bins for controlling recyclable waste until removed from Project sites. Include list of acceptable and unacceptable materials at each container and bin.

2. Inspect containers and bins contaminated materials if found.

4. Stockpile processed materials on-site without intermixing with other materials. Place, grade, and shape stockpiles to drain surface water. Cover to prevent windblown dust.

5. Stockpile materials away from construction areas. Do not store within drip line of remaining trees.

6. Store components off the ground and protect from the weather.

7. Remove recyclable waste from Owner's property and transport to recycling receiver or processor.

3.4. Disposal Of Waste

1. General: Except for items or materials to be salvaged, recycled, or otherwise reused, remove waste materials from Project sites and legally dispose of them in a landfill or incinerator acceptable to authorities having jurisdiction.

    1. Except as otherwise specified, do not allow waste materials that are to be disposed of accumulate on-site.

    2. Remove and transport debris in a manner that will prevent spillage on adjacent surfaces and areas.

2. Burning: Do not burn waste materials.

3. Disposal: Remove waste materials from Owner's property and legally dispose of them.

END OF SECTION

1. GENERAL

1.1. Section Includes

1. Administrative procedures preceding preliminary and final inspections of Work.

1.2. References

1. Canadian Construction Documents Committee (CCDC)
    1. CCDC 2 – 2008, Stipulated Price Contract.

1.3. Inspection, Review and Declaration

1. Contractor's Inspection: Contractor and all Subcontractors shall conduct an inspection of Work, identify deficiencies and defects, and repair as required to conform to Contract Documents.
    1. Notify Consultant in writing of satisfactory completion of Contractor’s Inspection and that corrections have been made.
    2. Request Owner, Consultants review.
2. Consultant's Review: Consultant and Contractor will review Work to identify obvious defects or deficiencies. Contractor shall correct Work accordingly.
3. Completion: submit written certificate that following have been performed:
    1. Work has been completed and inspected for compliance with Contract Documents.
    2. Defects have been corrected and deficiencies have been completed.
    3. Equipment and systems have been tested, adjusted and balanced and are fully operational.
    4. Certificates required by Boiler Inspection Branch, Fire Commissioner, Elevating Devices Branch and Utility companies have been submitted.
    5. Operation of systems have been demonstrated to Owner’s personnel.
    6. Work is complete and ready for Final Inspection.
4. Final Inspection: when items noted above are completed, request final inspection of Work by Owner, Consultants, and Contractor. If Work is deemed incomplete by Owner and /or Consultants, complete outstanding items and request re-inspection.
5. Declaration of Substantial Performance: when Owner, and Consultant consider deficiencies and defects have been corrected and it appears requirements of Contract have been substantially performed, make application for certificate of Substantial Performance. Refer to CCDC 2, General Conditions Article GC 5.4 - Substantial Performance of Work for specifics to application.
6. Commencement of Lien and Warranty Periods: date of Owner’s acceptance of submitted declaration of Substantial Performance shall be date for commencement for warranty period and commencement of lien period unless required otherwise by lien statute of Place of Work.
7. Final Payment: When Owner and Consultant consider final deficiencies and defects have been corrected and it appears requirements of Contract have been totally performed, make application for final payment. Refer to CCDC 2, General Conditions Article GC 5.7 for specifics to application. If Work is deemed incomplete by Owner and/or Consultant, complete outstanding items and request re-inspection.

8. Payment of Holdback: After issuance of certificate of Substantial Performance of Work, submit an application for payment of holdback amount in accordance with CCDC 2, General Conditions Article 5.5.

2. PRODUCTS (NOT APPLICABLE)

3. EXECUTION (NOT APPLICABLE)

END OF SECTION

1. GENERAL

1.1. Section Includes

1. As-built, samples, and specifications.
2. Equipment and systems.
3. Product data, materials and finishes, and related information.
4. Operation and maintenance data.
5. Spare parts, special tools and maintenance materials.
6. Warranties and bonds.
7. Final site survey.

1.2. Submission Requirements

1. Submit to the Consultant, two (2) final hardcopies of operating and maintenance manuals in English; include one digital copy in PDF format.
2. Prepare instructions and data by personnel experienced in maintenance and operation of described products. Acceptance of the maintenance manuals shall be subject to the review and approval of the Consultant.
3. Submit a draft copy of the tables of contents of the manuals thirty (30) days prior to the date of Substantial Performance of the Work, for review by the Consultant. Submit complete maintenance manuals with application for Substantial Performance, for review by the Consultant. Include a videotape of the systems demonstration required in Supplementary GC 5.4.1.3.
4. Manuals are to contain pertinent care, maintenance, operational and installation information for the building. Instructions in the manuals to be in plain language so as to guide the Owner in the proper operation and maintenance of building materials, finishes, components, equipment and systems.
5. Include all items covered by Change Orders and all equipment supplied by the Owner.
6. Ensure spare parts, maintenance materials and special tools provided are new, undamaged nor defective, and of same quality and manufacture as products provided in Work.
7. If requested, furnish evidence as to type, source and quality of products provided.
8. Defective products will be rejected, regardless of previous inspections. Replace products at own expense.
9. Pay costs of transportation.

1.3. Format

1. Organize data in the form of an instructional manual.
2. Size:
    1. Binders: vinyl, hard covered, 75 mm (3”) ‘D’ ring, loose leaf 219 x 279 mm (8-1/2”x11”) with spine and face pockets. Label the cover and spine of the manuals with the name of the project and manual contents.
    2. Oversized documents: maximum paper size for schedules and diagrams is 279 mm x 432 mm (11”x17”). Larger paper sizes will be accepted for diagrams only if a reduction to 11” x17” is also provided.

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

4. Cover: identify each binder with type or printed title ‘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 coloured flyleaf for each separate product and system, with typed description of product and major component parts of equipment.

7. Text: manufacturer’s printed data, or typewritten data.

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

9. Provide 1:1 scaled CAD files in DWG or VectorWorks format on CD or USB thumb drive.

1.4. Organizations of Manuals – Directory

1. Table of Contents:

    1. Provide title of project.

    2. Date of submission and name.

    3. Addresses, and telephone and facsimile numbers of Consultant, Engineers, Contractor, Subcontractors and major equipment and product suppliers and service contract suppliers with name of responsible parties; include emergency contact names.

    4. Schedule of products and systems, indexed to content of volume.

2. Provide a complete list of drawings, specifications, shop drawings and test reports for the project.

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

4. Product Data: mark each sheet to clearly 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. Provide logical sequence of instructions for each procedure, incorporating manufacturer’s instructions specified in Section 01 45 00 – Quality Control.

7. Training: Refer to Section 01 79 00 – Demonstration and Training.

1.5. Organization of Manuals – Architectural

1. Provide care, cleaning and recommended maintenance instructions for finishes and materials as specified.

2. Provide operation and maintenance instructions for equipment such as overhead doors, landscape irrigation systems and elevators. Provide descriptive and technical data, maintenance and operating procedures, wiring diagrams, spare parts list, name of service representatives, suppliers for replacement parts, trouble shooting data and preventative maintenance program. Provide information for reordering custom manufactured products. Instructions for cleaning agents and methods, precautions against detrimental agents and methods, and recommended schedule for cleaning and maintenance.

3. Provide copy of finish hardware schedule and paint schedules, complete with manufacturer, supplier and identification names and numbers.

4. Provide inspection and approval certificates from authorities having jurisdiction.

5. Provide RCABC and MPI Guarantee or equivalent bond and documentation.

6. Provide a copy of warranty and guarantee certificates as specified.

7. Provide a complete set of reviewed shop drawings.

8. Submit a list of chattels, if any, including make, model and serial number provided by the Contractor for the project.

1.6. Organization of Manuals – Mechanical

1. Provide an index with the following headings:

    1. Mechanical Drawings List.
    2. Description of Systems.
    3. Mechanical System Troubleshooting.
    4. Suggested preventative maintenance schedule, belt schedule, lubrication schedule.
    5. Subtrade and supplier list, equipment repair manuals.
    6. Chemical treatment certificates, hydrostatic and air test certificates.
    7. Balancing report.
    8. Valve tag schedule, piping and colour code.
    9. Equipment start up reports.
    10. Guarantee certificate, final inspection certificates, warrantee certificates.
    11. Sprinkler Shop Drawings.
    12. Vibrations Isolation Shop Drawings.
    13. Air Handling Unit & A/C Unit Shop Drawings.
    14. Fan Shop Drawings.
    15. Grille Shop Drawings.
    16. Radiant Heating Shop Drawings.
    17. Sump Pump Shop Drawings.
    18. Plumbing Fixtures and Drains Shop Drawings.
    19. Controls “as built” Drawings.
    20. WHMIS Information.
    21. Fire Protection Plan.

2. Under each of the above headings, provide the following information, arranged under separate tabs, for each system and major piece of equipment:

    1. Descriptive and Technical Data: include detailed description of the system and components, an explanation of how each component interfaces with others and the location of each thermostat and all controls. Give function, normal operation characteristics, and limiting conditions. Include performance curves with engineering data and tests, and complete nomenclature and commercial number of replaceable parts.

    2. Operating Procedures.

        1. Provide complete and detailed operation of each major component.
        2. Include starting procedure, exact switch and control location. Include start-up, break-in and routine normal operating instructions and sequences.

3. Describe operation of component controls, changes required for summer or winter operation and method of making changes. Include regulation, control, stopping, shut-down and emergency instructions.
4. Describe troubleshooting sequence when settings can not be maintained.
5. Describe safe guards to check if equipment goes off line.
6. Describe fire protection and smoke control.

3. Maintenance and Lubrication.

1. Provide detailed preventative maintenance schedule for each of the major components including daily, weekly, monthly, semi-annual and yearly checks and tasks. Provide list of lubricant required.
2. Describe lubrication and maintenance procedures for equipment components such as bearings, drives, motors, and filters. Include recommended lubricants. Include routine procedures and guide for troubleshooting; disassembly, repair and reassembly instructions; and aligning, adjusting, balancing, and checking instructions.
3. Compile this information for each typical piece of equipment.
4. Provide a belt schedule.

4. Required Manufacturer's Information.

1. Provide manufacturer's printed operation and maintenance instructions.
2. Provide original manufacturer's parts list, illustrations, assembly drawings, and diagrams required for maintenance.
3. Provide installed control diagrams by controls manufacturer.
4. Provide list of original manufacturer's spare parts, current prices, and recommended quantities to be maintained in storage.

5. List of Equipment Suppliers and Subcontractors.

1. Provide a complete list of equipment Suppliers and Subcontractors and service representatives including address and telephone numbers.
2. Outline procedures for purchasing parts and equipment.
3. Provide a detailed description including drawings, dimensions, parts list and repair manual for each piece of equipment specified.

6. Certification and Test Results. Include copies of the following:

1. Pre-operational cleaning reports and cleaning treatment.
2. Hydrostatic and air tests performed on piping systems.
3. Equipment alignment certificates.
4. Balancing reports for air and water systems.
5. Valve tag identification schedule including location, service and normal position; valve tag numbers, with locations and function of each valve, keyed to flow and control diagrams.
6. Pipe colour code.
7. Inspection and approval certificates for plumbing and gas systems and heating and ventilation systems.
8. Equipment start up reports.
9. Warranty certificates.

7. Shop Drawings.

1. Include copies of all reviewed shop drawings.

1.7. Organization of Manuals – Electrical

1. Provide an index with the following headings:
    1. Switch Gear and Distribution.
    2. Lighting Fixtures and Lamps.
    3. Fire Alarm System.
    4. Mechanical Motor Control Equipment.
    5. Security Systems.
2. Under each of the above headings, provide the following information, arranged under separate tabs, for each system and major piece of equipment:
    1. Descriptive and Technical Data.
    2. Maintenance and Operating Procedures.
    3. Colour Coded Wiring Diagrams.
    4. Spare Parts List.
    5. Service Representatives.
    6. Suppliers for Replacement Parts.
    7. Test Results.
    8. Certifications and Warranties.
    9. Trouble Shooting Data.
    10. Preventative Maintenance Program Complete With Checklists.
3. Panel board circuit directories: provide electrical service characteristics, controls and communications.

1.8. Shop Drawings

1. Include a copy of all reviewed shop drawings as noted in the schedule of Maintenance Manuals Submittals.

1.9. As-builts and Samples

1. Maintain at the site for Owner and Consultant one (1) record copy of:
    1. Contract Drawings.
    2. Specifications.
    3. Addenda.
    4. Change Orders and other modifications to the Contract.
    5. Reviewed shop drawings, product data, and samples.
    6. Field test records.
    7. Inspection certificates.
    8. Manufacturer’s certificates.
2. Store record documents and samples in field office apart from documents used for construction. 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. Label each document “PROJECT RECORD” in neat, large, printed letters.
4. Maintain record documents in clean, dry and legible condition. Do not use record documents for construction purposes.
5. Keep record documents and samples available for review by Consultant at each project meeting and as may be required.

6. Forward the record documents to Consultant for review. Revise drawings based on Consultant review comments and resubmit until Consultant is satisfied.

7. Provide the original and two (2) reproduced sets of record documents to Owner (through the Consultant).

8. Upon completion of the Work, employ the design consultants to produce two (2) sets of white prints and two (2) copies of CAD drawing files in PDF format on CD that include all as built conditions noted on the Contractor's "as-built" drawings. Each drawing shall include a graphic symbol that identifies all as built revisions, cross referenced to a master list with the date of each revision.

9. On each record document note the Contractor's identification, date of record, and the following statement: "We hereby certify that these drawings represent the work 'as-built'." Place the Contractor's signature under the statement.

10. The Contractor must sign each drawing and provide one Certificate of Record for the drawing set, as illustrated in the following paragraph, signed by persons authorized to sign on behalf of the Contractor. Deliver two complete sets of signed and certified drawings for review by the Consultant and the Owner.

11. The Certificate of Record is to read as follows:

    Certificate of Record – As Built Drawings

    I/We (name of Contractor) hereby certify that the set of as built drawings attached hereto, comprised of (–) sheets, is a complete and total record of the building(s) as constructed. I/We further certify that the drawings show accurately all structural details, all mechanical and electrical services, exposed or hidden that the Owner may fully rely on their accuracy in any future contemplated repairs, modifications or additions to this work.

    Signed by

    Contractor: _____

    Name of Contractor _____

    Per: _____

    Date: _____

    Witnessed by: _____

    Date: _____

12. The Certificate of Record shall be accompanied by a transmittal listing each drawing number, title and date.

13. Acceptance of the as-built documents shall be subject to the review and approval of the Consultant.

1.10. Recording Actual Site Conditions

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

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

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

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

1. Measured depths of elements of foundation in relation to finish first floor datum.
2. Measured horizontal and vertical locations of underground utilities and appurtenances, referenced to permanent surface improvements.
3. Measured locations of internal utilities and appurtenances, referenced to visible and accessible features of construction.
4. Field changes of dimension and detail.
5. Changes made by change orders.
6. Details not on original Contract Drawings.
7. References to related shop drawings and modifications.

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

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

    2. Changes made by Addenda and change orders.

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

1.11. Spare Parts

1. Provide spare parts, in quantities specified in individual specification sections.

2. Provide items of same manufacture and quality as items in Work.

3. Deliver to location as directed; place and store.

4. Receive and catalogue all items. Submit inventory listing to Consultant. Include approved listings in Maintenance Manual.

5. Obtain receipt for delivered products and submit prior to final payment.

1.12. Maintenance Materials

1. Provide maintenance and extra materials, in quantities specified in individual specification sections.

2. Provide items of same manufacture and quality as items in Work.

3. Deliver to location as directed; place and store.

4. Receive and catalogue all items. Submit inventory listing to Consultant. Include approved listings in Maintenance Manual.

5. Obtain receipt for delivered products and submit prior to final payment.

1.13. Special Tools

1. Provide special tools, in quantities specified in individual specification section.

2. Provide items with tags identifying their associated function and equipment.

3. Deliver to location as directed; place and store.

4. Receive and catalogue all items. Submit inventory listing to Consultant. Include approved listings in Maintenance Manual.

1.14. Storage, Handling and Protection

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 to satisfaction of Owner.

1.15. Warranties and Bonds

1. Separate each warranty or bond with index tab sheets keyed to Table of Contents listing.

2. List subcontractor, supplier, and manufacturer, with name, address, and telephone number of responsible principal.

3. Obtain warranties and bonds, executed in duplicate by subcontractors, suppliers, and manufacturers, within ten (10) days after completion of the applicable item of work.

4. Except for items put into use with Owner's permission, leave date of beginning of time of warranty until the Date of Substantial Performance is determined.

5. Verify that documents are in proper form, contain full information, and are notarized.

6. Co-execute submittals when required.

7. Retain warranties and bonds until time specified for submittal.

1.16. 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.

1.17. Schedule of Maintenance Manuals Submittals

1. The following table is a checklist of typical Maintenance Manual contents. The Contractor shall ensure that all manufacturer product information required by the Owner to maintain the building is included in the Maintenance Manuals. Note that some trades listed below may not apply to this particular project.

Table 1. Schedule of Maintenance Manuals Submittals, Specification Divisions 0-12; 32.

Trade (1)	Section (2)	Contacts (3)	Shop (4)	Installati (5)	Warrantie (6)	Suggest ed (7)	Care & Cleaning (8)	Hardware (9)	Colour (10)
Concrete	03 30 00	•							
Metals	05 05 00	•							
Rough Carpentry	06 10 10	•	•		•	•			
Finish Carpentry	06 20 00	•							
Dampproofing and Waterproofing	07 10 00	•							
Building Insulation	07 20 00	•			♦	♦			

Fibre Cement Siding	07 45 13	•	♦		♦	♦	♦		♦
Low Slope Membrane Roofing	07 52 00	•			♦	♦			
Joint Sealant	07 92 10	•							
Metal Doors and Frames	08 11 14	•	♦				♦		♦
Aluminum Entrances and Storefronts	08 11 16	•	♦				♦		
Wood Doors and Frames	08 14 00	•	♦		♦		♦		
Overhead Parkade Doors	08 36 00	•	♦			♦	♦		
Windows	08 50 00	•	♦		♦	♦	♦		
Finish Hardware	08 71 00	•	♦	♦	♦	♦	♦	♦	
Gypsum Board	09 21 16	•							
Ceramic Tile	09 31 00	•							
Resilient Flooring	09 65 16	•	♦		♦	♦	♦		
Painting	09 90 00	•			♦		♦		♦
Manufactured Specialties	10 00 00	•	♦		♦		♦		
Residential Equipment	11 31 00	•	♦	♦	♦		♦		
Manufactured Wood Casework	12 30 00	•	♦	♦	♦	♦	♦		
Window Treatment	12 50 00	•	♦		♦		♦		
Irrigation System	32 80 00	•	♦	♦	♦	♦	♦		
Planting	32 93 00	•				•			

Table 2. Schedule of Maintenance Manuals Submittals, Specification Divisions 14; 21-28.

(1)	(2)	(3)	(46)	(11)	(12)	(14)	(15)	(16)	(17)
Plumbing Systems	22 00 00	♦	♦	♦	♦	♦		♦	♦
HVAC	23 00 00	♦	♦	♦	♦	♦ (13,14)	♦	♦	♦
Electrical	26 00 00	♦	♦	♦	♦	♦	♦	♦	♦

Notes for Tables 1 and 2.

(1) Trade Listing

(2) Section Listing in Specifications

(3) Submit Subcontractor or Supplier's name, address, telephone and facsimile numbers and emergency contact.

(4) Submit copy of reviewed shop drawings or product data as specified. Submit engineered shop drawings where specified.

(5) Submit Installation instruction for which the Owner may be removing and reinstalling.

(6) Submit warranties and guarantees as call for in the specifications. Warranties and guarantees to be signed by an authorized signing authority.

(7) Submit list of recommended maintenance intervals for materials covered under warranties and guarantees.

(8) Submit manufacturer's instructions covering the care, cleaning and maintenance of specified finishes.

(9) Submit a complete copy of the hardware schedule in accordance with the specifications.

(10) Submit a complete listing of paint products, colours, gloss levels and locations.

(11) Submit descriptions and operation of major components and systems, including seasonal variations, interface with other components, and operation of controls.

(12) Submit a detailed preventative maintenance schedule, operating instructions, and complete trouble shooting checklists. Include schedules of tasks, frequency, tools required and task time.

(13) Submit testing, adjusting and balance reports.

(14) Submit inspection and testing certificates issued by authorities having jurisdiction and equipment manufacturers. Submit performance data sheets after commissioning is complete.

(15) Submit wiring diagrams and schematics as specified.

(16) Submit a complete list of equipment and fixtures installed as part of the Work complete with make and model numbers.

(17) Submit a complete list of spare parts for equipment, including source.

1.18. Maintenance and Renewal Plan

1. The Contractor shall provide the specified maintenance manuals and project documents to allow the Owner to prepare a Maintenance and Renewals (M&R) Plan for the project.

2. The Owner shall engage qualified personnel to prepare the M&R Plan. The M&R Plan shall be based on the maintenance manual and information supplied by the Contractor. The Plan shall include all necessary information to allow the Owner to conduct routine maintenance and meet the Owner's obligations under the primary Warranty and other warranties provide for the Work.

3. The Contractor shall submit the following:

    1. Draft Maintenance & Rehabilitation (M&R) Plan to owner within 30 business days after Substantial Completion of the building for review by Owner and the Consultant.

    2. Two hard copies (three ring binder format) along with an electronic (CD-ROM) version within 15 business days of written approval of the draft M&R Plan.

    3. The M&R Plan shall include the following:

        1. Contact list providing telephone numbers, fax numbers and addresses for the Consultants, Contractor and all Sub-contractors.

        2. Overview of necessity and use of the M&R Plan.

        3. Warranties for all materials, systems and equipment in the building, related maintenance requirements and, if applicable, Maintenance Bonds or Letters of Credit issued to cover the performance of particular building components.

        4. Overview of building envelope principles utilized in the design of the building's exterior walls, building envelope assemblies and components and associated maintenance requirements.

5. Glossary of terms utilized in the documentation.

6. As built drawings and specifications.

4. Maintenance schedule including the following elements:

1. 11”x17” format table with building element to be maintained or replaced along with a description of the task to be carried out including architectural, elevator, mechanical and electrical elements.

2. Note frequency of maintenance listing the specific year of maintenance over a minimum 20 year span along with the associated cost of maintenance.

3. Note key dates from the Warranty or warranties for manufactured items and the level of expertise required for each inspection.

5. Include an annual inspection checklist outlining items to be inspected, based on the Maintenance Schedule. The following completed project documents shall be included:

1. Substantial Performance Certificate.

2. Document Six – Canadian Standard Form of Agreement for Architectural Services.

3. CCDC 2 – Contract between Owner to Contractor.

4. Municipal Building Permit and Letters of Assurance.

5. Copy of Performance Bond.

6. Copy of all Warranties.

1.19. Fire Safety Plan

1. The Owner will engage a qualified consultant to prepare a fire safety plan and documents in accordance with the British Columbia Building Code, recent edition.

2. The Fire Safety Plan shall be submitted to the Consultant for Review.

3. The British Columbia Building Code requires that the fire safety plan be kept in a location designated by the Authority Having Jurisdiction.

2. PRODUCTS (NOT APPLICABLE)

3. EXECUTION (NOT APPLICABLE)

END OF SECTION

1. GENERAL

1.1. Section Includes

1. Procedures for demonstration and instruction of equipment and systems to Owner’s personnel.

1.2. Description

1. Demonstrate scheduled operation and maintenance of equipment and systems to Owner’s personnel two (2) week prior to date of substantial performance.

2. Owner will provide list of personnel to receive instructions, and will coordinate their attendance at agreed-upon times.

1.3. Quality Control

1. When specified in individual Sections, require manufacturer to provide authorized representative to demonstrate operation of equipment and systems, instruct Owner's personnel, and provide written report that demonstration and instructions have been completed.

1.4. Submittals

1. Submit schedule of time and date for demonstration of each item of equipment and each system two (2) weeks prior to designated dates, for Engineer’s approval.

2. Submit reports within one week after completion of demonstration, that demonstration and instructions have been satisfactorily completed.

3. Give time and date of each demonstration, with list of persons present.

1.5. Conditions for Demonstrations

1. Equipment has been inspected and put into operation in accordance with mechanical and/or electrical sections.

2. Testing, adjusting, and balancing has been performed in accordance with Section 01 91 00 – Commissioning and equipment and systems are fully operational.

3. Provide copies of completed operation and maintenance manuals for use in demonstrations and instructions.

1.6. Preparation

1. Verify that conditions for demonstration and instructions comply with requirements.

2. Verify that designated personnel are present.

1.7. Demonstration and Instructions

1. Demonstrate start-up, operation, control, adjustment, trouble-shooting, servicing, and maintenance of each item of equipment at agreed upon times, at the designated location.

2. Instruct personnel in all phases of operation and maintenance using operation and maintenance manuals as the basis of instruction.

3. Review contents of manual in detail to explain all aspects of operation and maintenance.

4. Prepare and insert additional data in operations and maintenance manuals when the need for additional data becomes apparent during instructions.

1.8. Time Allocated for Instructions

1. Ensure amount of time required for instruction of each item of equipment or system; consult the applicable Engineer or system manufacturer for approximate instruction time required.

2. PRODUCTS (NOT APPLICABLE)

3. EXECUTION (NOT APPLICABLE)

END OF SECTION

1. GENERAL

1.1. Section Includes

1. Includes general requirements for commissioning facilities and facility systems.

1.2. References

1. Associated Air Balance Council (AABC): National Standards For Field Measurements and Instrumentation, Total Systems Balance, Air Distribution-Hydronics Systems.

1.3. Quality Assurance

1. Provide testing organization services under provisions specified in Section 01 45 00 – Quality Control and related sections.

2. Testing organization: current member in good standing of AABC or other accredited agency certified to perform specified services.

3. Comply with applicable procedures and standards of the certification sponsoring association.

4. Perform services under direction of supervisor qualified under certification requirements of sponsoring association.

1.4. Submittals

1. Prior to start of Work, submit name of organization or Contractor personnel proposed to perform services. Designate who has managerial responsibilities for coordination of entire testing, adjusting and balancing.

2. Submit documentation to confirm organization or personnel compliance with quality assurance provision.

3. Submit three (3) preliminary specimen copies of each of report forms proposed for use.

4. Fifteen (15) days prior to Substantial Performance, submit three (3) copies of final reports on applicable forms.

5. Submit reports of testing, adjusting, and balancing postponed due to seasonal, climatic, occupancy, or other reasons beyond Contractor's control, promptly after execution of those services.

1.5. Procedures – General

1. Comply with procedural standards of certifying association under whose standard services will be performed.

2. Notify Engineer and Consultant three (3) days prior to beginning of operations.

3. Accurately record data for each step.

4. Report to Engineer and Consultant any deficiencies or defects noted during performance of services.

1.6. Final Reports

1. Organization having managerial responsibility shall make reports.

2. Ensure each form bears signature of recorder, and that of supervisor of reporting organization.

3. Identify each instrument used, and latest date of calibration of each.

1.7. Contractor Responsibilities

1. Prepare each system for testing and balancing.
2. Cooperate with testing organization and provide access to equipment and systems.
3. Provide personnel and operate systems at designated times, and under conditions required for proper testing, adjusting, and balancing.
4. Notify testing organization seven (7) days prior to time project will be ready for testing, adjusting, and balancing.

1.8. Preparation

1. Provide instruments required for testing, adjusting, and balancing operations.
2. Make instruments available to Engineer to facilitate spot checks during testing.
3. Retain possession of instruments and remove at completion of services.
4. Verify systems installation is complete and in continuous operation.
5. Verify lighting is turned on when lighting is included in cooling load.
6. Verify equipment such as computers, laboratory and electronic equipment are in full operation.

1.9. Execution

1. Test equipment, balance distribution systems, and adjust devices for HVAC systems.
2. Test hydronic systems, adjust and record liquid flow at each piece of equipment.

1.10. Schedule of Systems Requiring Testing, Adjusting, and Balancing Services

1. Refer to Mechanical Sections for schedules.

2. PRODUCTS (NOT APPLICABLE)

3. EXECUTION (NOT APPLICABLE)

END OF SECTION

1. GENERAL

1.1. Geotechnical report

1. A sub-soil investigation report on the building site has been prepared by Lewkowich Geotechnical Engineering Ltd.

2. The report is entitled “Geotechnical Assessment - LAHH Artist’s Studio Relocation, Oyster Bay Drive, Ladysmith, BC”

3. The report is identified as File No. F9198.01, and is dated July 19, 2021.

4. A copy of the sub-soil investigation report forms part of this section.

5. The sub-soil investigation report includes a description of the site and project, field investigation procedures, site observations, a summary of subsurface conditions and recommendations for site development and foundation design.

6. The report by its nature cannot reveal all conditions that exist or can occur on the site and the Contractor is assumed to be knowledgeable of the limitations of such reports. The report is provided for information only and no guarantee is made of the subsurface conditions other than at the exact borehole locations.

7. The Contractor is required to visit the site and acquaint himself with all existing conditions and the geotechnical report included in the contract documents.

8. Notify the Consultant immediately should subsurface conditions be encountered during the course of Work that differ materially from those described in the report.

2. PRODUCTS (NOT APPLICABLE)

3. EXECUTION (NOT APPLICABLE)

END OF SECTION

1. GENERAL

1.1. Summary

1. Refer to architectural drawings in conjunction with the specification.

1.2. Section Includes

1. Provide all labour, materials, tools and other equipment, services and supervision necessary for the complete installation of all concrete formwork, falsework and accessories indicated on the drawings and in the specifications.

1.3. Shop Drawings

1. Submit shop drawings for formwork and falsework in accordance with Section 01 33 00 – Submittal Procedures.

2. Indicate method and schedule of construction, shoring, stripping and re-shoring procedures, materials, arrangement of joints, special architectural exposed finishes, ties, liners, and locations of temporary embedded parts. Comply with CSA S269.1, for falsework drawings Comply with CAN/CSA-S269.3 for formwork drawings.

3. Indicate formwork design data, such as permissible rate of concrete placement, and temperature of concrete, in forms.

4. Indicate sequence of erection and removal of formwork/falsework as directed by Engineer.

5. Each shop drawing submission shall bear stamp and signature of qualified professional engineer registered or licensed in Provinces of British Columbia.

1.4. Waste Management and Disposal

1. Separate and recycle waste materials in accordance with Section 01 74 19 – Waste Management and Disposal and the Waste Reduction Workplan.

2. Place materials defined as hazardous or toxic waste in designated containers.

3. Ensure emptied containers are sealed and stored safely for disposal away from children.

4. Use sealers, form release and stripping agents that are non-toxic, biodegradable and have zero or low VOC's.

5. Divert wood materials from landfill to a recycling facility.

6. Divert plastic materials from landfill to a recycling facility.

7. Divert unused form release material from landfill to an official hazardous material collections site.

8. Collect and separate for disposal packaging material for recycling in accordance with Construction Waste Management Plan.

2. PRODUCTS

2.1. Materials

1. Formwork materials:

    1. Architectural Concrete Finish: all exposed exterior and interior concrete surfaces - medium density overlay plywood (smooth finish), or steel forms, for Architectural Concrete finish in accordance with CAN/CSA A23.1-04, Section 27, Item 27.4, Minimum thickness of plywood 3/4".

2. Smooth Form Finish: all exposed interior concrete surfaces, including slab soffits - plywood with non-absorptive liner such as urethane coating or medium density overlay plywood for Smooth Form finish in accordance with CAN/CSA 23.1, Section 24, item 24.3.6.

3. Rough Form Finish: all concealed concrete surfaces including elevator shafts, pits and trenches - plywood or shiplap, for Rough Form finish in accordance with CAN/CSA 23.1, Section 24, Item 24.3.5.

4. Forms shall not have patches, broken edges, or joint widths greater than 5/64”

2. Tubular column forms: round, spirally wound laminated fiber forms, internally treated with release material. Spiral pattern acceptable to show in hardened concrete.

3. Form ties:

1. For concrete not designated ‘Architectural’, use removable or snap-off metal ties, fixed or adjustable length, free of devices leaving holes larger than 25 mm (1”) diameter in concrete surface.

2. For ‘Architectural’ concrete, use snap ties complete with plastic cones and light grey concrete plugs recessed back from concrete 6mm (1/4”).

4. Form liner:

1. Plywood: medium density overlay Douglas Fir to CSA O121, square edge.

2. Secure lining taut to formwork to prevent folds.

3. Pull down lining over edges of formwork panels.

4. Ensure lining is new and not reused material.

5. Ensure lining is dry and free of oil when concrete is poured.

6. Application of form release agents on formwork surface is prohibited where drainage lining is used.

7. If concrete surfaces require cleaning after form removal, use only pressurized water stream so as not to alter concrete’s smooth finish.

5. Form release agent: chemically active release agents containing compounds that react with free lime in concrete resulting in water insoluble soaps.

6. Form stripping agent: colourless mineral oil, non-toxic, biodegradable, low VOC, free of kerosene, with viscosity between 15 to 24 mm^2/s (0.023 to 0.037 in^2/s) at 40°C (105°F), flashpoint minimum 150°C (300°F), open cup.

7. Falsework materials: to CSA-S269.1.

8. Sealant: to Section 07 92 10 – Joint Sealing.

3. EXECUTION

3.1. Fabrication and Erection

1. Verify lines, levels and centres before proceeding with formwork/falsework and ensure dimensions agree with drawings. Report all discrepancies to Engineer.

2. Obtain Engineer's approval for use of earth forms framing openings not indicated on drawings.

3. Hand trim sides and bottoms and remove loose earth from earth forms before placing concrete.

4. Fabricate and erect falsework in accordance with CSA S269.1 and COFI Exterior Plywood for Concrete Formwork.

5. Refer to architectural drawings for concrete members requiring architectural exposed finishes.

6. Do not place shores and mud sills on frozen ground.

7. Provide site drainage to prevent washout of soil supporting mud sills and shores.

8. Fabricate and erect formwork in accordance with CAN/CSA-S269.3 to produce finished concrete conforming to shape, dimensions, locations and levels indicated within tolerances required by CAN/CSA-A23.1.

9. Align form joints and make watertight. Keep form joints to minimum.

10. Locate horizontal form joints for exposed columns 2400 mm (8'-0") above finished floor elevation.

11. Use 19 mm (3/4") chamfer strips on external corners and/or 19 mm (3/4") fillets at interior corners, joints, unless specified otherwise, or indicated differently on the drawings.

12. Form chases, slots, openings, drips, recesses, expansion and control joints as indicated.

13. Construct forms for architectural concrete, and place ties as indicated and/or as directed. Joint pattern not necessarily based on using standard size panels or maximum permissible spacing of ties.

14. Build in anchors, sleeves, and other inserts required to accommodate Work specified in other sections. Assure that all anchors and inserts will not protrude beyond surfaces designated to receive applied finishes, including painting.

15. Clean formwork in accordance with CAN/CSA-A23.1, before placing concrete.

3.2. Removal and Reshoring

1. Leave formwork in place for following minimum periods of time after placing concrete.

    1. Three (3) days for walls and sides of beams.

    2. Seven (7) days for columns.

    3. Seven (7) days for beam soffits, slabs, decks and other structural members, or three (3) days when replaced immediately with adequate shoring to standard specified for falsework.

    4. Two (2) days for footings and abutments.

2. Remove formwork when concrete has reached two-thirds (2/3) of its design strength or minimum period noted above, whichever comes later, and replace immediately with adequate reshoring.

3. Provide all necessary reshoring of members where early removal of forms may be required or where members may be subjected to additional loads during construction as required.

4. Space reshoring in each principal direction at not more than 3000 mm (10'-0") apart.

5. Shores to remain in position for a minimum period of 28 days after concrete placement.

6. Re-use formwork and falsework subject to requirements of CAN/CSA-A23.1.

END OF SECTION

1. GENERAL

1.1. Summary

1. Refer to architectural drawings in conjunction with the specification.

1.2. Section Includes

1. Provide all labour, materials, tools and other equipment, services and supervision necessary for the complete installation of all cast-in-place concrete indicated on the drawings and in the specifications.

1.3. Related Sections

1. Section 01 33 00 - Submittal Procedures
2. Section 01 74 19 - Construction Waste Management
3. Section 32 13 15 - Concrete Walks, Curbs and Gutters
4. Section 03 10 00 - Concrete Forming Accessories
5. Section 03 20 00 - Concrete Reinforcing

1.4. References

1. Reference Standards:
    1. ASTM C260-10, Standard Specification for Air-Entraining Admixtures for Concrete.
    2. ASTM C309-11, Standard Specification for Liquid Membrane-Forming Compounds for Curing Concrete.
    3. ASTM C494/C494M-13, Standard Specification for Chemical Admixtures for Concrete.
2. Canadian General Standards Board (CGSB)
    1. CAN/CGSB-37.2-M88, Emulsified Asphalt, Mineral Colloid-Type, Unfilled, for Dampproofing and Waterproofing and for Roof Coatings.
    2. CAN/CGSB-51.34-M86(R1988), Vapour Barrier, Polyethylene Sheet for Use in Building Construction.
3. CSA International
    1. CSA A23.14/A23.2-14, Concrete Materials and Methods of Concrete Construction/ Methods of Test and Standard Practices for Concrete.
    2. CSA A283-06 (R2011), Qualification Code for Concrete Testing Laboratories.
    3. CSA A3000-[08], Cementitious Materials Compendium (Consists of A3001, A3002, A3003, A3004 and A3005).

1.5. Submittals

1. Provide submittals in accordance with Section 01 33 00 - Submittal Procedures.
2. Provide testing results for review by Consultant and do not proceed without written approval when deviations from mix design parameters are found.
3. Concrete pours: provide accurate records of poured concrete items indicating date and location of pour, quality, air temperature and test samples taken as described in PART 3 - FIELD QUALITY CONTROL.

4. Concrete hauling time: maximum allowable time of 120 minutes for concrete to be delivered to site of Work and discharged after batching.

1.6. Quality Assurance

1. Quality Assurance: in accordance with Section 01 45 00 - Quality Control.

2. Provide Consultant, minimum 2 weeks prior to starting concrete work, with valid and recognized certificate from plant delivering concrete.

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

3. Minimum four (4) weeks prior to starting concrete work, submit proposed quality control procedures in accordance with Section 014500 – Quality Control for Engineer's approval for following items:

    1. Falsework erection.

    2. Hot weather concrete.

    3. Cold weather concrete.

    4. Curing.

    5. Finishes.

    6. Formwork removal.

    7. Joints.

4. Quality Control Plan: provide written report to Consultant verifying compliance that concrete in place meets performance requirements of concrete as established in PART 2 - PRODUCTS.

1.7. Delivery, Storage and Handling

1. Delivery and Acceptance Requirements:

    1. Concrete hauling time: deliver to site of Work and discharged within 120 minutes maximum after batching.

        1. Do not modify maximum time limit without receipt of prior written agreement from Consultant and concrete producer as described in CSA A23.1/A23.2.

        2. Deviations to be submitted for review by Consultant.

    2. Concrete delivery: ensure continuous concrete delivery from plant meets CSA A23.1/A23.2.

1.8. Waste Management and Disposal

1. Separate and recycle waste materials in accordance with Section 01 74 19 – Waste Management and Disposal and the Waste Reduction Workplan.

2. Use excess concrete for: additional paving, post footing anchorage, swale rip-rap reinforcing, mud slab, flowable fill, footing bottom, retaining wall footing ballast, storm structure covers, underground utility pipe kickers, storm pipe flared end section, toe wash protection, or shoulder and toe outfall restraints for temporary erosion pipes.

3. Use trigger operated spray nozzles for water hoses.

4. Designate a cleaning area for tools to limit water use and runoff.

5. Carefully coordinate the specified concrete work with weather conditions.

6. Ensure emptied containers are sealed and stored safely for disposal away from children.

7. Prevent plasticizers, water-reducing agents and air-entraining agents from entering drinking water supplies or streams. Using appropriate safety precautions, collect liquid or solidify liquid with an inert, noncombustible material and remove for disposal. Dispose of all waste in accordance with applicable local, provincial and national regulations.

8. Choose least harmful, appropriate cleaning method that will perform adequately.

2. PRODUCTS

2.1. Design Criteria

1. Prescription: to CSA A23.1/A23.2, and as described in MIXES of PART 2 - PRODUCTS

2.2. Materials

1. Portland cement with 40% fly ash replacement: to CAN/CSA-A5.

2. Supplementary cementing materials: to CAN/CSA-A23.5.

3. Cementitious hydraulic slag: to CAN/CSA-A363.

4. Water: to CAN/CSA-A23.1.

5. Aggregates: to CAN/CSA-A23.1. Coarse aggregates to be normal density.

6. Low density aggregate for insulating concrete: to CAN/CSA-A23.1.

7. Air entraining admixture: to CAN3-A266.1.

8. Chemical admixtures: to CAN3-A266.2. Engineer to approve accelerating or set retarding admixtures during cold and hot weather placing.

    1. Air entraining admixture: to ASTM C260.

    2. Chemical admixture: to ASTM C494. Consultant to approve accelerating or set retarding admixtures during cold and hot weather placing.

    3. Admixtures shall not contain Calcium chloride.

9. Concrete retarders: to CAN3-A266.2 water based, low VOC, solvent free. Do not allow moisture of any kind to come in contact with the retarder film.

10. Shrinkage compensating grout: premixed compound consisting of metallic or non-metallic aggregate, Portland cement, water reducing and plasticizing agents.

    1. Compressive strength: 50 MPa at twenty-eight (28) days.

    2. Consistency:

        1. Fluid: to ASTM C827. Time of efflux through flow cone (ASTM C939), under 30s.

        2. Flowable: to ASTM C827. Flow table, 5 drops in 3s, (ASTM C109, applicable portion) 125 to 145%.

        3. Plastic: to ASTM C827. Flow table, 5 drops in 3 s, (ASTM C109, applicable portions) 100 to 125 %.

        4. Dry pack to manufacturer’s requirements.

11. Non premixed dry pack grout: composition of non metallic aggregate Portland cement with sufficient water for the mixture to retain its shape when made into a ball by hand and capable of developing compressive strength of 50 MPa at 28 days.

12. Post-Tensioning ducts: to CAN/CSA-A23.1.

13. Concrete curing and sealing compound: Where slabs are to receive resilient flooring or carpeting, use curing compounds compatible with flooring adhesive. Do not use where bond required for additional concrete or surface coating. Acceptable products are as specified in 03 35 00 - Concrete Finishes.

14. Cushion pads: tough, resilient, weather, moisture, and oil resistant material that will not corrode or cause corrosion, consisting of either layers of approved cotton duck saturated and bound together by approved rubber or synthetic compounds, or made from specially compounded synthetic materials.

15. Water stops: extruded PVC, min 1/4" thick, complete with fastening rings and appurtenances as required, min 6" wide (Type 5):

    1. W.R. Meadows Sealtight Type 6316

    2. Durajoint as supplied by Sternson Construction Products

    3. Greenstreak Type 679

    4. Consultant approved equivalent

16. Premoulded joint fillers:

    1. Bituminous impregnated fiber board: to ASTM D1751.

    2. Sponge rubber: to ASTM D1752, Type I, flexible grade.

17. Weep hole tubes: plastic.

18. Dovetail anchor slots: minimum 0.6 mm thick galvanized steel with insulation filled slots.

19. Dampproof membrane:

    1. Dampproofing: Emulsified asphalt, mineral colloid type, unfilled: to CAN/CGSB-37.2, and to Section 07 11 13 – Bituminous Dampproofing.

20. Polyethylene film: 0.25 mm (10 mil) thickness to CAN/CGSB-51.34.

21. Joint Sealant: for basement foundation and walls

    1. Sikaflex 202 primer

    2. Sikaflex 2X NS, one compnent, polyurethane sealant, except where otherwise indicated

2.3. Concrete Mixes

1. Concrete mix to CSA A23.1.

    1. Ensure materials used in concrete mix have been submitted for testing and meet requirements of CSA A23.1.

    2. Coordinate construction methods to suit concrete mix proportions and parameters.

    3. Identify and report immediately to Consultant when concrete mix design and parameters pose anticipated problems or deficiencies related to construction.

    4. Mix #1 (refer to Structural Engineer Specification):

1. Intended application: footings and foundation walls.
2. Compressive Strength: 25MPa.
3. Class of exposure: N.
4. Aggregate: normal density, maximum size 3/4” mm.
5. Supplementary cementing materials:
6. Air content category: -
7. Slump: at time and point of discharge maximum 3” mm.

5. Mix #2 (refer to Structural Engineer Specification):
   1. Intended application: interior columns.
   2. Compressive Strength: 30 MPa
   3. Class of exposure: N.
   4. Aggregate: normal-density, maximum size 3/4” mm
   5. Supplementary cementing materials:
   6. Air content category: -
   7. Slump: at time and point of discharge maximum 3” mm
6. Mix #3 (refer to Structural Engineer Specification):
   1. Intended application: exterior columns.
   2. Compressive Strength: 30 MPa.
   3. Class of exposure: F-2.
   4. Aggregate: normal-density, maximum size 3/4” mm.
   5. Supplementary cementing materials:
   6. Air content category: 4-7%
   7. Slump: at time and point of discharge maximum 3” mm.
7. Mix #4 (refer to Structural Engineer Specification):
   1. Intended application: suspended slab.
   2. Compressive strength: 35 MPa.
   3. Class of exposure: F-2.
   4. Aggregate: normal density, maximum size 3/4” mm.
   5. Supplementary cementing materials:
   6. Air content category: 4-7%
   7. Slump: at time and point of discharge maximum 3” mm.
8. Mix #5 (refer to Structural Engineer Specification) :

1. Intended application: slab on grade - interior.
2. Compressive strength: 32 MPa.
3. Class of exposure: N.
4. Aggregate: normal-density, maximum size 3/4” mm.
5. Supplementary cementing materials:
6. Air content category: -
7. Slump: at time and point of discharge maximum 3” mm.

9. Mix #6 (refer to Structural Engineer Specification):
   1. Intended application: slab on grade - exterior.
   2. Compressive strength: 32 MPa.
   3. Class of exposure: C-1.
   4. Aggregate: normal-density, maximum size 3/4” mm.
   5. Supplementary cementing materials:
   6. Air content category: 5-8%
   7. Slump: at time and point of discharge maximum 3” mm.
10. Mix #7 (refer to Structural Engineer Specification):
    1. Intended application: concrete topping.
    2. Compressive strength: 32 MPa
    3. Class of exposure: N.
    4. Aggregate: normal-density, maximum size 3/8” mm.
    5. Supplementary cementing materials:
    6. Air content category: -
    7. Slump: at time and point of discharge maximum 3” mm.
11. Mix #8 (refer to Structural Engineer Specification):
    1. Intended application: housekeeping pads.
    2. Compressive strength: 30 MPa.
    3. Class of exposure: F-2.
    4. Aggregate: normal-density, maximum size 3/4” mm.
    5. Supplementary cementing materials:
    6. Air content category: 4-7%
    7. Slump: at time and point of discharge maximum 3” mm.
12. Mix #9 (refer to Structural Engineer Specification):

1. Intended application: elevator footings and foundation walls.
2. Compressive strength: 25 MPa.
3. Class of exposure: N.
4. Aggregate: normal-density, maximum size 3/4” mm.
5. Supplementary cementing materials:
6. Air content category: -
7. Slump: at time and point of discharge maximum 3” mm.

3. EXECUTION

3.1. Preparation

1. Obtain Consultant's written approval before placing concrete.
    1. Provide 48 hours minimum notice prior to placing of concrete.
2. Place concrete reinforcing in accordance with Section 03200 - Concrete Reinforcing. During concreting operations:
    1. Development of cold joints not allowed.
    2. Ensure concrete delivery and handling facilitates placing with minimum of re-handling, and without damage to existing structure or Work.
3. Pumping of concrete is permitted only after approval of equipment and mix.
4. Ensure reinforcement and inserts are not disturbed during concrete placement.
5. Prior to placing of concrete obtain Consultant's approval of proposed method for protection of concrete during placing and curing. Provide minimum of 7-day moist curing for all slabs.
6. Protect previous Work from staining.
7. Clean and remove stains prior to application for concrete finishes.
8. Maintain accurate records of poured concrete items to indicate date, location of pour, quality, air temperature and test samples taken.
9. In locations where new concrete is dowelled to existing work, drill holes in existing concrete.
    1. Place steel dowels of deformed steel reinforcing bars and pack solidly with epoxy grout to anchor and hold dowels in positions as indicated.
10. Concrete shall be deposited continuously, or in layers of such thickness that no concrete will be deposited on concrete which has hardened sufficiently to cause the formation of seams or plains of weakness.
11. Placing shall be carried out at such a rate that concrete which is being integrated with fresh concrete is still plastic
12. Compact concrete with high-frequency vibrators applied directly to concrete by experienced personnel. Do not over-vibrate
13. Do not place load upon new concrete until authorized by Consultant.

3.2. Construction

1. Do cast-in-place concrete work in accordance with CAN/CSA-A23.1.

2. Sleeves and inserts:

    1. No sleeves, ducts, pipes or other openings shall pass through joists, beams, column capitals or columns, except where indicated or approved by Engineer.

    2. Where approved by Engineer, set sleeves, ties, pipe hangers and other inserts and openings as indicated or specified elsewhere. Sleeves and openings greater than 100 x 100 mm (4” x 4”) not indicated, must be approved by Engineer.

    3. Do not eliminate or displace reinforcement to accommodate hardware. If inserts cannot be located as specified, obtain approval of modifications from Engineer before placing of concrete.

    4. Check locations and sizes of sleeves and openings shown on drawings.

    5. Set special inserts for strength testing as indicated and as required by non-destructive method of testing concrete.

3. Anchor bolts:

    1. Set anchor bolts to templates under supervision of appropriate trade prior to placing concrete.

    2. With approval of Engineer, grout anchor bolts in preformed holes or holes drilled after concrete has set. Formed holes to be minimum 100 mm (4”) diameter. Drilled holes to manufacturer’s recommendations.

    3. Protect anchor bolt holes from water accumulations, snow and ice build-ups.

    4. Set bolts and fill holes with shrinkage compensating grout or epoxy grout.

    5. Locate anchor bolts used in connection with expansion shoes, rollers and rockers with due regard to ambient temperature at time of erection.

4. Drainage holes and weep holes:

    1. Form weep holes and drainage holes in accordance with Section 03 10 00 – Concrete Forms and Accessories. If wood forms are used, remove them after concrete has set.

    2. Install weep hole tubes and drains as indicated.

5. Dovetail anchor slots:

    1. Install continuous vertical anchor slot to forms where masonry abuts concrete wall or columns.

    2. Install continuous vertical anchor slots at 800 mm (2’-8”) on centre where concrete walls are masonry faced.

6. Grout under base plates and machinery using procedures in accordance with manufacturer's recommendations which result in 100% contact over grouted area.

7. Finishing:

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

    2. Finish concrete in accordance with Section 03350 – Concrete Finishes.

3. Use procedures as those noted in CSA A23.1/A23.2 to remove excess bleed water. Ensure surface is not damaged.

4. Use curing compounds compatible with applied finish on concrete surfaces. Provide written declaration that compounds used are compatible.

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

6. Provide screed finish unless otherwise indicated.

7. Rub exposed sharp edges of concrete with carborundum to produce 3 mm minimum radius edges unless otherwise indicated.

8. Waterstops:

1. Install waterstops to provide continuous water seal at all joints in all foundation walls surrounding below-grade occupied spaces to provide continuous water seal.

2. Do not distort or pierce waterstop in way as to hamper performance.

3. Do not displace reinforcement when installing waterstops.

4. Use equipment to manufacturer's requirements to field splice waterstops.

5. Tie waterstops rigidly in place.

6. Use only straight heat-sealed butt joints in field.

7. Use factory welded corners and intersections unless otherwise approved by Consultant.

9. Joint fillers:

1. Furnish filler for each joint in single piece for depth and width required for joint, unless otherwise authorized by Consultant.

2. When more than one piece is required for joint, fasten abutting ends and hold securely to shape by stapling or other positive fastening.

3. Locate and form construction joints as indicated.

4. Install joint filler.

5. Use ½” thick joint filler to separate slabs-on-grade from vertical surfaces and extend joint filler from bottom of slab to finished slab surface unless indicated otherwise.

10. Dampproof membrane:

1. Install dampproof membrane under concrete slabs-on-grade inside building.

2. Lap dampproof membrane minimum 150 mm (6”) at joints and seal.

3. Seal punctures in dampproof membrane before placing concrete.

4. Use patching material at least 150 mm (6”) larger than puncture and seal.

11. Control Joints

1. Provide control joints in foundations walls in accordance with the details on the drawings at maximum 6.0m on centre. Align joints to suit architectural features.

2. Provide saw-cut joints in all slabs-on-grade in accordance with the details on the drawings to suit Architectural finishes. Review locations with the Consultant.

12. Housekeeping and Equipment Pads:

    1. Provide concrete pads and curbs under equipment where indicated on drawings and as specified in Division 15 and Division 16 and to approved shop drawings.

    2. Prepare base concrete with a rough scratch finish and use an approved bonding agent to bond concrete pad to base course.

    3. Dowel pads and curbs to base slab in accordance with details on the drawings.

3.3. Site Tolerance

1. Concrete tolerance in accordance with CAN/CSA-A23.1.

3.4. Field Quality Control

1. Site tests: conduct tests in accordance with Section 01 45 00 - Quality Control and submit report as described in PART 1 - ACTION AND INFORMATIONAL SUBMITTALS.

    1. Concrete pours.

    2. Slump.

    3. Air content.

    4. Compressive strength at 7 and 28 days.

    5. Air and concrete temperature.

2. Inspection and testing of concrete and concrete materials will be carried out by testing laboratory designated by Owner's Representative for review to CSA A23.1/A23.2.

    1. Ensure testing laboratory is certified to CSA A283.

3. Owner's will pay for costs of tests.

4. Testing laboratory will take additional test cylinders during cold weather concreting. Cure cylinders on job site under same conditions as concrete which they represent.

5. Inspection or testing by Consultant will not augment or replace Contractor quality control nor relieve Contractor of his contractual responsibility.

6. If results of tests show concrete to be less than specified in quality or strength, the Consultant shall have the right to have the mix designs altered for the remainder of the work at no cost to the Owner. Further testing and remedial measures required by CAN/CSA-A23.1 shall be done, the costs of this work paid for by the Contractor

3.5. Cleaning

1. Waste Management: separate waste materials for recycling in accordance with Section 01 74 19 - Construction Waste Management.

    1. Materials and Resources Credit MRc2.1 Construction Waste Management: Divert 50% From Landfill and MRc2.2 Construction Waste Management: Divert 75% from Landfill: prepare Construction Waste Management plan in accordance with Section 01 74 19 - Construction/Demolition Waste Management.

    2. Divert unused concrete materials from landfill to local facility after receipt of written approval from Owner's Representative.

    3. Provide appropriate area on job site where concrete trucks and be safely washed.

4. Divert unused admixtures and additive materials (pigments, fibres) from landfill to official hazardous material collections site as approved by Owner's Representative.

5. Do not dispose of unused admixtures and additive materials into sewer systems, into lakes, streams, onto ground or in other location where it will pose health or environmental hazard.

6. Prevent admixtures and additive materials from entering drinking water supplies or streams.

7. Using appropriate safety precautions, collect liquid or solidify liquid with inert, non-combustible material and remove for disposal.

8. Dispose of waste in accordance with applicable local, Provincial/Territorial and National regulations.

END OF SECTION

1. GENERAL

1.1. Summary

1. Refer to architectural drawings in conjunction with the specification.

1.2. Section Includes

1. Provide all labour, materials, tools and other equipment, services and supervision necessary for the complete installation of all concrete finishing indicated on the drawings and in the specifications.

1.3. Related Sections

1. Section 03 10 00 - Concrete Forming and Accessories
2. Section 03 20 00 - Concrete Reinforcing
3. Section 03 30 00 - Cast-in-Place Concrete
4. Section 09 90 00 - Painting

1.4. Performance Requirements

1. Product quality and quality of work in accordance with Section 01 61 00 – Common Product Requirements.
2. Submit written declaration that components used are compatible and will not adversely affect finished flooring products and their installation adhesives.

1.5. Product Data

1. Submit product data in accordance with Section 01 33 00 – Submittal Procedures.
2. Submit WHMIS MSDS - Material Safety Data Sheets. WHMIS MSDS acceptable to Labour Canada and Health and Welfare Canada for concrete floor treatment materials. Indicate VOC content.
3. Include application instructions for concrete floor treatment(s).

1.6. Waste Management and Disposal

1. Separate and recycle waste materials in accordance with Section 01 74 19 - Waste Management and Disposal and the Waste Reduction Workplan.
2. Place materials defined as hazardous or toxic waste in designated containers.
3. Ensure emptied containers are sealed and stored safely for disposal away for children.
4. Use chemical hardeners that are non-toxic, biodegradable and have zero or low VOC's.
5. Dispose of surplus chemical and finishing materials in accordance with federal, provincial and municipal regulations.
6. Dispose of waste from stripping of floors in a manner that will not have unfavourable effects on the environment.

1.7. Environmental Requirements

1. Temporary lighting: Minimum 1200 W light source, placed 2.5 m above floor surface, for each 40 m^2 of floor being treated.
2. Electrical power: Provide sufficient electrical power to operate equipment normally used during construction.

3. Work area: Make the work area water tight protected against rain and detrimental weather conditions.

4. Temperature: Maintain ambient temperature of not less than 10°C (50°F) from seven (7) days before installation to at least 48 hours after completion of work and maintain relative humidity not higher than 40% during same period.

5. Moisture: Ensure concrete substrate is within moisture limits prescribed by flooring manufacturer.

6. Safety: Comply with requirements of Workplace Hazardous Materials Information System (WHMIS) regarding use, handling, storage, and disposal of hazardous materials.

7. Ventilation:

    1. Ventilate area of work as directed by Consultant by use of approved portable supply and exhaust fans.

    2. Ventilate enclosed spaces in accordance with Section 01 51 00 – Temporary Utilities.

    3. Provide continuous ventilation during and after coating application.

2. PRODUCTS

2.1. Sealing Compounds

1. Surface sealer: to CAN/CGSB-25.20, Type 2 - water based, clear .

    1. Acceptable product: “Florseal WB-25” by Sika, or pre-approved alternative.

2.2. Mixes

1. Mixing, ratios and application in accordance with manufacturer's instructions.

3. EXECUTION

3.1. Examination

1. Verify that slab surfaces are ready to receive work and elevations are as indicated on drawings and as instructed by the manufacturer.

3.2. Preparation of Existing Slab

1. Rub exposed sharp edges of concrete with carborundum to produce 3 mm radiused edges unless otherwise indicated.

2. Saw cut control joints to CSA-A23.1, 24 hours maximum after placing of concrete.

3. Use mechanical stripping to remove chlorinated rubber or existing surface coatings.

3.3. Application

1. After floor treatment is dry, seal control joints and joints at junction with vertical surfaces with sealant.
2. Refer to Section 07 92 10 - Joint Sealing.
3. Apply floor treatment in accordance with Sealer manufacturer's written instructions.
4. Clean overspray. Clean sealant from adjacent surfaces.

3.4. Protection

1. Protect finished installation in accordance with manufacturer's instructions.

3.5. Schedule

1. Refer to finishes list on drawings for location of concrete floor sealing.

END OF SECTION

1. GENERAL

1.1. Summary

1. Refer to architectural drawings in conjunction with the specification.

1.2. Section Includes

1. Section includes polished concrete finishing and scoring.
    1. Concrete for polished concrete, including formwork, reinforcement, concrete materials, mixture design, placement procedures, initial finishing, and curing is specified in Section 03 30 00 "Cast-in-Place Concrete."
2. Refer to Section 03 30 00 "Cast-in-Place Concrete" for concrete not designated as polished. concrete.

1.3. Related Sections

1. Section 03 10 00 - Concrete Forming and Accessories
2. Section 03 20 00 - Concrete Reinforcing
3. Section 03 30 00 - Cast-in-Place Concrete

1.4. Preinstallation Meetings

1. Preinstallation meeting: Conduct meeting at project site.
2. Before submitting design mixtures, review concrete design mixture and examine procedures for ensuring quality of concrete materials. Require representatives of each entity directly concerned with polished concrete to attend, including the following:
    1. Contractor's superintendent.
    2. Independent testing agency responsible for concrete design mixtures.
    3. Ready-mix concrete manufacturer.
    4. Cast-in-place concrete subcontractor.
    5. Polished concrete finishing Subcontractor.
    6. Concrete finishing system manufacturer's field representative.
3. Review cold and hot-weather concreting procedures, curing procedures, construction joints, concrete repair procedures, concrete finishing, and protection of polished concrete.

1.5. Product Data

1. Submit product data (for each type of product) in accordance with Section 01 33 00 – Submittal Procedures.
2. Sustainable Design Submittals:
    1. Laboratory Test Reports: For [stains] [and] [liquid floor treatments], indicating compliance with requirements for low-emitting materials. CDPH California Department of Public Health.
3. Polishing Schedule: Submit plan showing polished concrete surfaces and schedule of polishing operations for each area of polished concrete before start of polishing operations. Include locations of all joints, including construction joints.

4. Samples for Initial Selection: For each type of product requiring colour selection.
5. Samples for Verification: For each type of exposed colour.
6. Information Submittals
    1. Qualification Data: For Installer.
    2. Material Certificates: For each of the following, signed by manufacturers:
        1. Stain materials.
        2. Liquid densifier floor treatments.

1.6. Quality Assurance

1. Installer Qualifications: A firm experienced in performing polished concrete finishing similar in material, design, and extent to that indicated for this Project, whose work has resulted in applications with a record of successful in-service performance, and that employs workers trained by manufacturer.
2. Source Limitations for Polished Concrete Finishing Materials: Obtain concrete floor liquid densifier treatment products of one manufacturer with resources to provide products of consistent quality in physical properties and resulting appearance.
3. Field Sample Panels: After approval of verification sample and before casting concrete, produce field sample panels to demonstrate the approved range of selections made under Sample submittals. Produce a minimum of three sets of full-scale panels, approximately 48 by 48 inches (1200 by 1200 mm) minimum, to demonstrate the expected range of finish, colour, and appearance variations.
    1. Locate panels as indicated or, if not indicated, as directed by Architect.
    2. Maintain field sample panels during construction in an undisturbed condition as a standard for judging the completed Work.
    3. Demolish and remove field sample panels when directed.
4. Manufacturer: ISO 9001 quality certified as primary manufacturer of specified products.
5. Mockups: Before casting concrete, build mockups to verify selections made under Sample submittals and to demonstrate typical joints, surface finish, tolerances, and standard of workmanship. Build mockups to comply with the following requirements, using materials indicated for the completed Work:
    1. Build mockups in location and of size indicated or, if not indicated, as directed by Architect.
    2. Provide mockup area lighting similar in illumination, lumen output, colour temperature, and both height and distance from surface as that of final areas to receive polished concrete finishing.
    3. Use the same personnel, equipment, tools and methods as will be used for the remaining interior floor slab.
    4. Mockup shall demonstrate each **colour, pattern, all joint treatments, inside wall edge treatments, and any protective sealers**.
    5. Demonstrate curing, finishing, and protecting of polished concrete.
    6. Do not begin full scale product applications, floor polishing operations, or deliver major materials until Architect has approved mockup.
    7. Subject to compliance with requirements, approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

1.7. Field Conditions

1. Traffic Control: Maintain access for vehicular and pedestrian traffic as required for other construction activities.

2. PRODUCTS

2.1. Stain Materials

1. This section is not used.

2.2. Liquid Floor Treatments

1. Penetrating Liquid Densifier Floor Treatments for Polished Concrete Finish: Clear, waterborne solution of inorganic silicate and siliconate materials and proprietary components; odourless; that penetrates, hardens, and is suitable for polished concrete surfaces.
    1. Basis-of-Design Product: Subject to compliance with requirements, provide Euclid Chemical Company (The); **Euco Diamond Hard** or a comparable product by one of the following:
        1. Bomat Products, Inc.
        2. L&M Construction Chemicals, Inc.

2.3. Related Materials

1. Joint Sealants: Provide joint sealants, backings, and other related materials that are compatible with one another and with joint substrates under conditions of service and application, as demonstrated by joint-sealant manufacturer, based on testing and field experience.
    1. Sealant shall comply with the testing and product requirements of the California Department of Public Health's "Standard Method for the Testing and Evaluation of Volatile Organic Chemical Emissions from Indoor Sources Using Environmental Chambers."
2. Joint Sealant: Single-Component Polyurethane: Provide the following:
    1. Urethane, S, NS, 35, T, NT: Single-component, nonsag, plus 35 percent and minus 35 percent movement capability, nontraffic-use, urethane joint sealant; ASTM C 920, Type S, Grade NS, Class 35, Uses NT, M, A, and O.
        1. Basis-of-Design Product: Subject to compliance with requirements, provide Euclid Chemical Company (The); an RPM company; EUCOLASTIC 1NS or a comparable product by one of the following:
            1. Bomat Products, Inc.
            2. LymTal International Inc.
    2. Urethane, S, P, 50, T, NT: Single-component, pourable, plus 50 percent and minus 50 percent movement capability, traffic-use, urethane joint sealant; ASTM C 920, Type S, Grade NS, Class 50, Uses T, M, A, and O.
        1. Basis-of-Design Product: Subject to compliance with requirements, provide Euclid Chemical Company (The); EUCOLASTIC 1SL or a comparable product by one of the following:
            1. Bomat Products, Inc.
            2. LymTal International Inc.
3. Semirigid Epoxy Joint Filler: Two-component, semirigid, 100 percent solids, epoxy resin with a Type A shore durometer hardness of 100 according to ASTM D 2240, and meeting requirements of ACI 302.
    1. Basis-of-Design Product: Subject to compliance with requirements, provide Euclid Chemical Company (The); EUCO 700 or a comparable product by one of the following:

1. Bomat Products, Inc.

2. MAPEI Corporation.

4. Semirigid Polyurea Joint Filler: Two-component, semirigid, 100 percent solids, aromatic polyurea with a Type A shore durometer hardness range of 64 to 68 according to ASTM D 2240, and meeting requirements of ACI 302.

1. Basis-of-Design Product: Subject to compliance with requirements, provide Euclid Chemical Company (The); an RPM company; EUCO QWIKJOINT UVR 65 or a comparable product by one of the following:

1. Bomat Products, Inc.

2. MAPEI Corporation.

3. EXECUTION

3.1. Preparation

1. Surface Preparation And Cleaning:

1. Utilizing non-powered, hand-held tools and only mild cleaning chemicals that will not damage or mar concrete surface, remove remaining saw cut residue, form glue, texture overspray, paint drippings, and other built-up material on the floor surface.

2. Power-sweep floor area with dust-free equipment.

3. Treat oil spots with oil emulsifier and oil absorbent materials to remove oils from below concrete surface. Scrub oil spot areas and remove liquids with vacuum.

4. Scrub floor with automatic scrubber capable of a minimum of 80 pounds head pressure, each head to be equipped with cleaning combo or light grit brushes and a neutral pH cleaning detergent that is compatible with the liquid densifier/sealer. Remove liquid as floor is scrubbed. Scrub floor a second and final time with clean water only and remove liquid as floor is scrubbed. Allow slab to air dry.

3.2. Application

1. Apply Liquid Densifier Sealer in strict accordance with the directions of the manufacturer. Spray, squeegee or roll on liquid to clean, dry concrete surface at a rate no greater than 225 sq. ft. per gallon. The liquid shall be scrubbed into the surface with a mechanical scrubber. Keep the surface wet for a minimum of 30 minutes with the Liquid Densifier Sealer during the application process. When the product thickens, but not more than 60 minutes after initial application, the surface shall then be squeegeed or vacuumed to remove all excess liquid.

1. Do not leave any residue on surface.

2. Do not track material on to untreated surfaces .

3.3. Scoring

1. Scoring: Score decorative jointing in concrete surfaces 1/4 inch (6.4 mm) deep with diamond blades to match pattern indicated. Rinse until water is clear.

3.4. Polishing

1. Polishing Process Timing: Allow concrete floor slab to cure minimum of 28 days prior to commencing polished concrete finishing.

2. Polish:Level 2: Low sheen, 800 grit

3. Apply polished concrete finish system to cured and prepared slabs to match accepted mockup.

    1. Machine grind floor surfaces to receive polished finishes level and smooth

    2. Polishing Process Procedures: The following procedures are provided as a guide. Many factors, including, but not limited to interior floor slab finish, hardness and flatness will determine the initial diamond tooling and/or additional polishing operations required to meet the requirements specified herein.

    3. Clean floor slab thoroughly. Note: It is imperative that the floor is entirely and absolutely clean prior to proceeding to the next step.

    4. Grinding Operation (First Pass): Mount 3 or 4 (depending on model of equipment) 150-grit metal bonded diamonds to the drive plate. Grinding process shall be done dry. Each grinding pass must overlap 25% of the previous grinding pass. Grind the concrete floor to eliminate oil, dirt, loose scale and other contaminants from concrete surface.

    5. Application of Liquid Densifier: Depending on overall floor condition, apply deep, penetrating liquid densifier (Euco Diamond Hard) to floor surface. Apply at manufacturer's suggested application rate and allow sufficient time for the reaction and hardening process to take place.

    6. Polishing Operation (Second Pass): Mount 3 or 4 (depending on model of equipment) 100-grit resin bonded diamonds to the drive plate. Polishing process shall be done dry. Each polishing pass must overlap 25% of the previous polishing pass. Polish the concrete floor to eliminate the metal bond scratches and prepare the floor for polishing.

    7. Polishing Operation (Third Pass): Mount 3 or 4 (depending on model of equipment) 200-grit resin bonded diamond tooling to each auto scrubber drive plate. Polishing process shall be done dry. Each polishing pass must overlap 25% of the previous polishing pass. Polish the concrete floor to eliminate scratches left by previous step.

    8. Polishing Operation (Fourth Pass): Mount 3 or 4 (depending on model of equipment) 400-grit resin bonded diamond tooling to each auto scrubber drive plate. Polishing process shall be done dry. Each polishing pass must overlap 25% of the previous polishing pass. Polish the concrete floor to eliminate scratches left by previous step.

    9. Polishing Operation (Fifth Pass): Mount 3 or 4 (depending on model of equipment) 800-grit resin bonded diamond tooling to each auto scrubber drive plate. Polishing process shall be done dry. Each polishing pass must overlap 25% of the previous polishing pass. Polish the concrete floor to leave desired sheen.

    10. Liquid Densifier/Sealer: Immediately following final polishing process, provide a second application of liquid penetrating/sealer densifier at 700 sq. ft. /gallon. This shall constitute the second and final application of liquid densifier/sealer. Buff floor surface with one pass of a beige-buffing pad to achieve the desired appearance. Completely clean floor of any remaining residue.

    11. Control and dispose of waste products produced by grinding and polishing operations.

3.5. Joint Filling

1. Prepare, clean, and install joint filler according to manufacturer's written instructions.

    1. Defer joint filling until concrete has aged at least **[six]** month(s) or as long as possible after floor installation. Do not fill joints until construction traffic has permanently ceased.

2. Remove dirt, debris, saw cuttings, laitance, curing compounds, sealers and other foreign materials from joints. Leave contact faces of joints clean and dry.

1. Clean inner joint walls mechanically using dustless dry-cut saw, or similar tool, to the full depth of saw cuts and 2 inch minimum depth in construction joints so as to remove any form release agents, curing compounds, sealer residues, and other surface contaminations that may interfere with bond of the specified joint filler material. Then clean dust and debris from mechanically prepared joints by vacuuming joint.

3. Install semirigid joint filler full depth in saw-cut joints and at least 2 inches (50 mm) deep in formed joints. Overfill joint and trim joint filler flush with top of joint after hardening. Concave joints are not acceptable.

    1. Mix and install sealant and filler in accordance with manufacturer's recommendations.

    2. Use primer if recommended for specific application.

    3. Install semirigid joint filler full depth in saw-cut joints.

        1. Construction Joints Through Slab: Fill by one of the following methods:

    4. Fill joint with dry-bagged silica sand to within 2 inches of slab surface.

        1. Insert compressible backer rod to a minimum depth of 2 inches below slab surface.

4. Overfill joint and trim joint filler flush with top of joint after hardening.

3.6. Repairs, Protection, and Cleaning

1. Repair damaged finished surfaces of polished cast-in-place architectural concrete when approved by Architect. Match repairs to colour, texture, and uniformity of surrounding surfaces and to repairs on approved mockups.

    1. Remove and replace polished cast-in-place architectural concrete that cannot be repaired to Architect's approval.

2. Protect polished cast-in-place architectural concrete from staining, laitance, and contamination during remainder of construction period.

3. Protect surfaces of polished cast-in-place architectural concrete from contamination by oil, grease, hydraulic fluid, paint, adhesives, flux, and other contaminants.

    1. Diaper all hydraulic powered equipment to avoid staining of concrete.

    2. Do not park vehicles on coloured floor.

    3. Do not perform pipe cutting on coloured floor.

    4. Do not store metals subject to oxidation on coloured floor.

    5. Inform all trades that concrete slab is a finished surface and must be protected.

END OF SECTION

1. GENERAL

1.1. Summary

1. Refer to architectural drawings in conjunction with the specification.

1.2. Related Sections

1. Section 01 33 00 - Submittal Procedures
2. Section 03 30 00 - Cast-in-Place Concrete
3. Section 08 11 14 - Metal Doors and Frames
4. Section 09 90 00 - Painting and Coatings

1.3. Description

1. Miscellaneous metal fabrications include but are not limited to:
    1. Guardrails, handrails, balustrades; stainless steel, powder coated or galvanized as per drawings.
    2. Steel angle supports
    3. Steel channel fames
    4. Trench drawings
    5. Louvre frames
    6. Pipe and conduit guards
    7. Sump covers and frames, galvanized
    8. Anchor bolts/nuts/ washers: zinc0coated fasteners for exterior use or where built into exterior, and interior side of moisture barrier
    9. Concrete inserts: Hot dipped galvanized
    10. Nuts, bolts, washers, hot dipped galvanized. Anchcor bolts shall be in accordance with ASTM A36/A36M or A307. Coordinate with structural drawings for anchor bolts.
    11. Metal screens to secure enclosed spaces such as mechanical ducts, pipes and intake and exhaust bents from bird/insect ingress
    12. Bike racks; galvanized, stainless steel or powder coated as per project requirements
    13. Other miscellaneous metal fabrications as shown on drawings or details.
    14. Metal fabrications where noted to be galvanized and are to be hot dip galvanized.

1.4. References

1. American Society for Test and Materials International (ASTM)
    1. ASTM A53/A53M-12, Specification for Pipe, Steel, Black and Hot-dipped, Zinc-Coated Welded and Steamless.
    2. ASTM A307-14, Specification for Carbon Steel Bolts and Studs, 60,000 PSI Tensile Strength.
2. Canadian General Standards Board (CGSB)

1. CAN/CGSB-1.40-97, Anti-corrosive Structural Steel Alkyd Primer.

2. CAN/CGSB-1.181-99, Ready-Mixed, Organic Zinc-rich coating.

3. Canadian Standards Association (CSA International)

1. CAN/CSA-G40.20/G40.21-09(R2014), General Requirements for Rolled or Welded Structural Quality Steel.

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

3. CAN/CSA-S16.-14, Limit States Design of Steel Structures.

4. CSA W48-14, Filler Metals and Allied Materials for Metal Arc Welding (Developed in co-operation with the Canadian Welding Bureau).

5. CSA W59-13, Welded Steel Construction (Metal Arc Welding) (Imperial Version).

1.5. Section Includes

1. Provide all labour, materials, tools and other equipment, services and supervision necessary for the complete installation of all metal fabrications indicated on the drawings and in the specifications.

2. Supply and installation of metal fixings generally, as may be required for anchorage, bracing, stiffening or stability.

3. All anchor bolts and expansion bolts or other means of anchorage where necessary.

4. Supply and installation of welded steel handrails and guard rails in locations shown on the drawings, complete with continuous top and bottom rails, round vertical pickets, corner posts, wall-mount brackets, braces, angles, clips, anchor plates and hemispherical ends.

1.6. Product data:

1. Submit manufacturer's printed product literature, specifications and data sheet in accordance with Section 01 33 00 - Submittal Procedures.

2. Submit copies of WHMIS MSDS - Material Safety Data Sheets in accordance with Section 01 33 00 - Submittal Procedures. Indicate VOC’s:

1. For finishes, coatings, primers and paints.

1.7. Shop Drawings

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

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

3. Submit to Consultant shop drawings for all metal fabrications included in this Section for review and approval prior to fabrication.

4. Registered structural engineer in the Province of British Columbia to provide signed and sealed shop drawings and letters of Assurance for guardrails, handrails and other miscellaneous metal fabrications.

1.8. Protection

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

2. Cover exposed stainless steel surfaces with pressure sensitive heavy protection paper or apply strippable plastic coating, before shipping to job site.

3. Leave protective covering in place until final cleaning of building. Provide instructions for removal of protective covering.

1.9. Quality Assurance

1. Fabricator qualifications: Company specializing in performing the work of this section with a minimum of five documented experience

2. Installer qualifications: Fabricator.

2. PRODUCTS

2.1. Materials

1. Consider using materials that are sourced locally and have a high recycled content.

2. All exterior ledger angles, lintels and related components connections, bolts, plates etc. hot dip galvanized.

3. Zinc Rich Galvanized Primer for touch up work

4. High zinc dust content paint for re-galvanized welds in galvanized steel conform to ASTM A780/ A780M-09.

5. Steel sections and plates: to CAN/CSA-G40.20/G40.21, Grade 350W.

6. Steel pipe: to ASTM A53/A53M weight and finish as indicated.

7. Welding materials: to CSA W59.

8. Welding electrodes: to CSA W48 Series.

9. Bolts and anchor bolts: to ASTM A307.

10. Aluminum sheet: proprietary utility sheet, plain, thickness as indicated.

11. Stainless steel tubing: to ASTM A269, Type 302, Commercial Grade, seamless welded with AISI No.4 finish.

12. Grout: non-shrink, non-metallic, flowable, 15 MPa at 24 hours; pull-out strength 7.9 MPa.

2.2. Fabrication

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

2. Use self-tapping shake-proof round headed screws on items requiring assembly by screws or as indicated. Use screws for interior metal work. Use welded connections for exterior metal work unless otherwise approved by Consultant.

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

4. Ensure exposed welds are continuous for length of each joint. File or grind exposed welds smooth and flush. Seal exterior steel fabrications to provide corrosion protection in accordance with CAN3-S16.1-M84.

2.3. Finishes

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

2. Chromium plating: chrome on steel with plating sequence of 0.009 mm thickness of copper 0.010 mm thickness of nickel and 0.0025 mm thickness of chromium.

3. Shop coat primer: to CAN/CGSB-1.40.

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

5. Bituminous paint: to CAN/CGSB-1.108.

6. Alu-Zinc AZ150 Galvalume: metals exposed to the exterior and metals found used for rain screen. Refer to Section 09 90 00 - Painting and Coatings for exterior finishes.

2.4. Isolation Coating

1. Isolate aluminum from following components, by means of bituminous paint:

    1. Dissimilar metals except stainless steel, zinc, or white bronze of small area.
    2. Concrete, mortar and masonry.
    3. Wood.

2.5. Shop Painting

1. Apply one shop coat of primer to metal items, with exception of galvanized or concrete encased items.

2. Use primer unadulterated, as prepared by manufacturer. Paint on dry surfaces, free from rust, scale, grease. Do not paint when temperature is lower than 7°C (45°F).

3. Clean surfaces to be field welded; do not paint.

2.6. Angle Lintels

1. Steel angles: galvanized, painted, sizes indicated for openings. Provide 150 mm (6”) minimum bearing at ends.

2. Weld or bolt back-to-back angles to profiles as indicated.

3. Finish: shop painted.

4. Refer to structural drawings for size of angles.

2.7. Channel Frames

1. Fabricate frames from steel, sizes of channel and opening as indicated.

2. Weld channels together to form continuous frame for jambs and head of openings, sizes as indicated.

3. Finish:prime coat painted.

3. EXECUTION

3.1. Erection

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

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

3. Provide suitable means of anchorage acceptable to Engineer such as dowels, anchor clips, bar anchors, expansion bolts and shields, and toggles.

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

5. Provide components for building by other sections in accordance with shop drawings and schedule.

6. Make field connections with bolts to CAN/CSA-S16.1, or weld.

7. Hand items over for casting into concrete or building into masonry to appropriate trades together with setting templates.

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

9. Touch-up galvanized surfaces with zinc rich primer where burned by field welding.

3.2. Clean-up

1. Perform cleaning after installation to remove construction and accumulated environmental dirt. Leave all metal fabrications smooth, clean, free from rust and other deleterious matter that would inhibit painting.

2. As the work proceeds and upon completion of the work, promptly remove all waste material and used containers and leave the work neat and clean to the satisfaction of the Consultant.

END OF SECTION

1. GENERAL

1.1. Summary

1. Refer to architectural drawings in conjunction with the specification.

1.2. Section Includes

1. Provide all labour, materials, tools and other equipment, services and supervision necessary for the complete application of all wood treatment indicated on the drawings and in the specifications.

2. The work in this section includes but is not limited to:

    1. Factory treatment of new lumber and plywood (installed exterior to the sheathing membrane such as strapping, blocking, etc).

    2. Factory treatment of fire-retardant plywood.

    3. Field treatment of all field cuts in new treated lumber and plywood.

1.3. Quality Assurance

1. Plant inspection of products treated with preservative and fire-retardant by pressure impregnation will be carried out by designated testing laboratory to AWPA.M2, and revisions specified in CAN/CSA-O80 Series, Supplementary Requirements to AWPA Standard M2.

2. Inspection and testing of insert materials will be carried out by a Testing Laboratory designated by Engineer.

3. Owner will pay for costs of tests as specified in Section 01 29 83 – Payment Procedures for Testing Laboratory Services.

4. **Under no circumstances shall ACQ (alkaline copper quaternary) preservative be used anywhere on site, whether pre-applied to wood products or applied on site, unless compatible fasteners and metal accessories are used.**

1.4. Regulatory Requirements

1. Each board or bundle of fire-retardant treated material or panel to bear ULC label indicating Flame Spread Classification (FSC), and smoke developed.

1.5. Certificates

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

2. For products treated with preservative or fire-retardant by pressure impregnation submit following information certified by authorized signing officer of treatment plant:

    1. Information listed in AWPA.M2 and revisions specified in CAN/CSA-O80 Series, Supplementary Requirement to AWPA Standard M2 applicable to specified treatment.

    2. Moisture content after drying following treatment with water-borne preservative or fire-retardant.

    3. Acceptable types of paint, stain, and clear finishes that may be used over treated materials to be finished after treatment.

1.6. Waste Management and Disposal

1. Separate and recycle waste materials in accordance with Section 01 74 10 – Construction Waste Management and Disposal.

2. Place materials defined as hazardous or toxic waste in designated, labelled containers.

3. Collect and separate plastic and/or paper packaging for recycling.

1.7. Delivery, Storage and Handling

1. Handle and store in such a manner as to prevent damage; pile neatly on raised platform and protect with waterproof cover in dry waterproof building.

2. Packaged materials shall have manufacture's labels and seals intact.

3. Store flammable materials outside the building. Abide by fire protection regulation of authority having jurisdiction.

2. PRODUCTS

2.1. Materials

1. Preservative for lumber not directly exposed to weather such as rainscreen strapping shall be disodium octaborate tetrahydrate (DOT).

2. Borate preservative for rough carpentry not in contact with ground and continuously protected liquid from water: to CAN/CSA-O80 Series, pressure treated wood with Borate treatment.

    1. Materials should mark the marking program according to Wood Preservation Canada. Bottom plate of frame walls with sill gaskets does not require pressure treating.

3. Fasteners: use hot-dipped galvanized fasteners meeting ASTM A153 and connectors meeting ASTM A653 Class G185 for CA pressure treated wood.

4. Fire-Retardant: to CAN/CSA-O80.20 for lumber and CAN/CSA-O80.27 for plywood.

    1. Flame Spread Classification: FSC 25 or less.

    2. Smoke developed of not more than: 25 or less

5. Chromated Copper Arsenate (CCA) for exterior landscape elements: to CAN/CSA-O80 Series, pressure treated plywood and lumber with CCA treatment.

3. EXECUTION

3.1. Preparation

1. Where work to follow may be adversely affected by staining or other problems due to the use of preservatives, conform to the manufacturer's instructions ad apply sealer as required to prepare for other trades.

3.2. Application: Borate Preservative

1. Treat lumber to CAN/CSA-O80 Series using borate preservative to obtain minimum net retention of 2.7 kg/m^3 of wood.

2. Following water-borne preservative treatment, dry material to maximum moisture content of 15%.

3.3. Application: CCA Preservative

1. Treat lumber and plywood to CAN/CSA-O80 Series using chromated copper arsenic 050 preservative to obtain minimum net retention of 4.0 kg/m^3 of wood. Treat material to be below grade to a minimum net retention of 6.43 kg/m^3 of wood.

2. Following water-borne preservative treatment, dry material to maximum moisture content of 19%.

3.4. Application: Fire-Retardant

1. Treat plywood by pressure impregnation with fire-retardant chemicals in accordance with CAN/CSA-O80.27.

2. Following treatment, kiln-dry material to maximum moisture content of 19%.

3.5. Application: Field Treatment

1. Comply with AWPA.M4 and revisions specified in CAN/CSA-O80 Series, Supplementary Requirements to AWPA Standard M2.

2. Remove chemical deposits on treated wood to receive applied finish.

3. Treat cut surfaces with two brush strokes of copper napthanate preservative for CCA treated material and liquid borate treated material.

END OF SECTION

1. GENERAL

1.1. Summary

1. Refer to architectural drawings in conjunction with the specification.

1.2. Section Includes

1. Provide all labour, materials, tools and other equipment, services and supervision necessary for the complete installation of all rough carpentry indicated on the drawings and in the specifications.
2. Installation of wood stud wall framing, including all openings and all bay windows, canopies and offsets.
3. Installation of plywood sheathing to exterior walls and all designated shear walls.
4. Installation of plywood roof sheathing to sloped roof areas including H-clips, cants and curbs.
5. Installation of plywood roof sheathing to low-sloped roof areas including all slopes, counter-slopes, cants, curbs and parapet walls.
6. Installation of floor joists, engineered wood joists, roof joists, built-up beams, structural composite lumber, lintels, posts, bridging, blocking, furred-down ceiling framing and furred-out walls.
7. Construction of all interior stairs including stringers, treads, risers, landing framing and flooring and all necessary support framing.
8. Construction of interior ramp(s) including landing framing and flooring, and all necessary support framing; and construction of any temporary exterior ramp(s).
9. Installation welded steel door frames in framed exterior and interior walls.
10. Construction of all furred-down bulkheads to accommodate all building services, including bulkheads over kitchen cabinets as indicated on the drawings; and, all vertical shafts to accommodate building services in locations shown on the drawings.
11. Framing and blocking to roof access hatches, including all necessary ledgers and supports.
12. Miscellaneous blocking and backing as shown on the drawings, and as may be required for stair handrails, cabinets, counters, washroom accessories, and other similar building elements.
13. Installation of all preformed metal firestopping.
14. Cutting and framing to Division 25, Division 26, Division 27 and Division 28 requirements and electrical, telephone and cablevision backboards.
15. Refer to structural drawings and notes for additional requirements for rough carpentry.

1.3. Related Sections

1. Section 01 33 00 - Submittal Procedures
2. Section 06 05 73 - Wood Treatment

1.4. References

1. American National Standards Institute (ANSI)
    1. .1 ANSI/NPA A208.1-2009, Particleboard, Mat Formed Wood.
2. American Society for Testing and Materials International (ASTM)

1. ASTM A653/A653M-13, Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvanealled) by the Hot-Dip Process.
2. ASTM D1761-12, Standard Test Methods for Mechanical Fasteners in Wood.
3. ASTM D5055-13, Standard Specification for Establishing and Monitoring Structural Capacities of Prefabricated Wood I-Joists.
4. ASTM D5456-14, Standard Specification for Evaluation of Structural Composite Lumber Products.

3. Canadian General Standards Board (CGSB)
   1. CAN/CGSB-11.3-M87, Hardboard.
   2. CAN/CGSB-51.32-M77, Sheathing, Membrane, Breather Type.
   3. CAN/CGSB-51.34-M86, Vapour Barrier, Polyethylene Sheet for Use in Building Construction.
   4. CAN/CGSB-71.26-M88, Adhesive for Field-Gluing Plywood to Lumber Framing for Floor Systems.
4. Canadian Standards Association (CSA International)
   1. CSA A123.2-03(R2013), Asphalt Coated Roofing Sheets.
   2. CAN/CSA-A247-M86(R1996), Insulating Fiberboard.
   3. CSA B111-1974(R2003), Wire Nails, Spikes and Staples.
   4. CAN/CSA-G164-M92(R2003), Hot Dip Galvanizing of Irregularly Shaped Articles.
   5. CSA O112.10-08(R2013), CSA Standards for Wood Adhesives.
   6. CSA O121-08(R2013), Douglas Fir Plywood.
   7. CSA O122-06(2011), Structural Glued-Laminated Timber.
   8. CSA O141-05(R2014), Softwood Lumber.
   9. CSA O151-09(R2014), Canadian Softwood Plywood.
   10. CSA O153--13, Poplar Plywood.
   11. CAN/CSA-O325-07(R2012), Construction Sheathing.
   12. CSA O437 Series-93(R2006), Standards on OSB and Waferboard.
5. National Lumber Grades Authority (NLGA)
   1. Standard Grading Rules for Canadian Lumber 2014.
6. Truss Design and Procedures for Light Metal Connected Wood Trusses, Truss Plate Institute of Canada.

1.5. Submittals

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

1.6. Quality Assurance

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

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

1.7. Waste Management and Disposal

1. Separate and recycle waste materials in accordance with Section 01 74 19 – Construction Waste Management and Disposal to the maximum extent economically possible.

2. Separate wood waste in accordance with the Waste Management Plan and place in designated areas in the following categories for recycling:

    1. Solid wood, softwood, or hardwood.

    2. Treated, painted, or contaminated wood.

    3. Other.

3. Separate wood waste in accordance with the Waste Management Plan and place in designated areas in the following categories for re-use on site:

    1. Sheet materials larger than 300 mm (1’-0”) in both directions.

    2. Framing members larger than 600 mm (2’-0”) in length.

    3. Multiple off-cuts of any size larger than 300 mm (1’-0”).

4. Set aside damaged wood and dimensional lumber off-cuts for approved alternative uses (bracing, blocking, cripples, bridging, or similar). Store this separated reusable wood waste convenient to cutting station and area of work.

5. Separate metal, plastic, wood and corrugated cardboard-packaging in accordance with the Waste Management Plan and place in designated areas for recycling.

6. Do not burn scrap at the project site.

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

2. PRODUCTS

2.1. Framing and Structural Materials

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

    1. CAN/CSA-O141.

    2. NLGA Standard Grading Rules for Canadian Lumber, latest edition, and CAN/CSA-086.1-M89 including supplements and commentary.

2. Glued end-jointed (finger-jointed) lumber: NLGA Special Products Standard SPS, are acceptable for load-bearing walls and posts.

3. Glulam: in accordance with Structural Glued-Laminated Timber CAN/CSA-O122.

4. Wood I-joists: in accordance with Prefabricated Wood I-Joists ASTM D 5055.

5. Light-frame trusses: in accordance with “Truss Design and Procedures for Light Metal Connected Wood Trusses”, Truss Plate Institute of Canada.

6. Structural Composite Lumber (SCL): in accordance with Evaluation of Structural Composite Lumber Products ASTM D 5456.

7. Framing and board lumber: in accordance with BCBC, current edition. All lumber to be fee of splits, shakes, loose or large knots.

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

    1. S2S is acceptable.

    2. Board sizes: “Standard” or better grade.

    3. Dimension sizes: “Standard” light framing or better grade.

    4. Post and timbers sizes: “Standard” or better grade.

9. Wood framing grades and species:

MEMBER	SPECIES	GRADE
Joists & Planks:	Spruce Pine Fir or D. Fir	No.2 and Better
Lintels, Beams & Stringers:	Spruce Pine Fir	No.2 and Better
Posts:	Douglas Fir	No.2 and Better
Sills & Plates:	Spruce Pine Fir or D. Fir	No.2 and Better
Studs:	Spruce Pine Fir; Douglas Fir; Hem Fir	No.2 and Better
Plank Decking:	Douglas Fir	Commercial or Select

10. Machine stress-rated lumber is acceptable for all purposes.

11. All plates and framing in direct contact with concrete, all inset posts, and all drainage cavity strapping shall be treated with preservative according to Section 06 05 73 – Wood Treatment.

2.2. Panel Materials

1. Roof sheathing: Douglas fir plywood (DFP) exterior type 16 mm (5/8”), standard sheathing; and Douglas Fir plywood exterior Type 16 mm (5/8”) T&G edges standard sheathing (refer to structural drawings) to CSA 0121-M1978.

2. Exterior wall sheathing: Douglas fir plywood exterior type square edge 13 mm (1/2”) standard sheathing, with CCA pressure treatment.

3. Electrical equipment backing: 19 mm (3/4”) sanded Douglas Fir plywood good one side; fire retardant treated.

4. Subfloor sheathing: 19 mm (3/4”) Douglas Fir plywood sheathing grade, T&G edges.

5. Exterior deck sheathing: Sheathing grade Douglas Fir plywood, T&G Select Tight Face Type, 19 mm (3/4”) face plywood for all exterior balconies.

6. Interior Shearwall sheathing: sheathing grade Douglas Fir plywood to CSA 0121, 13 mm (1/2”) thickness minimum, blocked all edges, refer to structural drawing schedules.

7. Stair treads: Douglas Fir plywood (DFP) 25 mm (1”) thickness minimum.

8. Mat-formed structural panelboards (OSB wafer): to CAN3-O437.0. (interior shear walls only).

9. Insulating fiberboard sheathing: to CAN/CSA-A247.

10. Glass fibre board sheathing: non-structural, rigid, faced, fiberglass, insulating exterior sheathing board.

11. Isocyanurate or Urethane sheathing: to CGSB-51- GP-21M or CAN/CGSB-51.26, unfaced or faced.

12. Expanded polystyrene sheathing: to CAN/CGSB-51.20.

13. Gypsum sheathing: to CSA-A82.27.

14. Waferboard: to CAN3-0188.2-M78.

15. Hardboard: to CAN/CGSB-11.3-M87.

16. Plywood Underlayment: G-1-S DFP to CSA 0121-M78, or G-1-S CSP to CSA 0151-M78.

2.3. Structural Composite Lumber Products (SCL)

1. Structural Composite Lumber (SCL) in accordance with Evaluation of Structural Composite Lumber Products ASTM D 5456.

2. If requested, provide certification by a professional engineer registered in British Columbia that the SCL beams and columns are structurally capable of carrying the specified loads.

3. SCL lumber products shall be one of the following, or pre-approved equivalent:

    1. Glulam

    2. Microllam

    3. Parallam

2.4. Engineered Wood Joist Products

1. If requested, provide certification by a professional engineer registered in British Columbia that the engineered wood joist products are structurally capable of carrying the specified loads.

2. Provide ULC testing reference numbers to confirm that the engineered wood joist products have been tested for fire resistance rating (FRR) and sound transmission class rating (STC) to the level required as noted for assemblies shown on the drawings. Acceptable product list below does not imply acceptability of use of those products in fire- or sound-rated assemblies.

3. Acceptable products: “TJI® Joists” by Weyerhauser Ltd.; “JSI™ Joists” by Jager Engineered Wood Products; “LP® Solidstart® I-Joists” by Louisiana-Pacific Corporation; “Wood-I-Beam™” as manufactured by Georgia-Pacific Corporation; or pre-approved equivalent.

4. Submit latest product information to the Architect prior to installation.

2.5. Accessories

1. Polyethylene film: to CAN/CGSB-51.34, Type 1, 0.15 mm (6 mil) thick, UV protected.

2. Air seal: closed cell polyurethane or polyethylene.

    1. Sill gaskets: 89 mm (3-1/2”) and 140 mm (5-1/2”) x 6 mm (1/4”) closed cell polyurethane.

    2. Acceptable product: “Ethafoam 221” by Dow, or pre-approved equivalent.

3. Sealants: refer to Section 07 92 10 – Joint Sealing.

4. Subflooring adhesive: to CGSB-71.26, cartridge loaded.

5. General purpose adhesive: to CSA-O112 Series.

6. Nails, spikes and staples: to CSA-B111-1974; hot dipped galvanized to exterior of moisture barrier, interior highly humid areas and for treated lumber; plain finish elsewhere. Use 2” #8 screws, plain finish for subfloors.

7. Bolts: to ASTM-A307 or -A325 (see structural drawings and notes); 12.7 mm (1/2”) diameter unless indicated otherwise, complete with nuts and washers.

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

9. Joist hangers and framing hangers for general light framing: minimum 1 mm (16 gauge) thick sheet steel, galvanized ZF001 coating designation, as manufactured for this purpose. Refer to structural drawings for details of special joist hangers required.

10. Nailing discs: flat caps, minimum 25 mm (1") diameter, minimum 0.4 mm (1/64") thick, sheet metal, fibre, formed to prevent dishing. Bell or cup shapes not acceptable.

11. Roof sheathing H-Clips: formed "H" shape, thickness to suit panel material, extruded 6063-T6 aluminum alloy type approved by Engineer.

12. Steel plate connectors and bearing plates: to ASTM-A36 or CSA.G40.21 grade 300W. In exterior locations, plates to be hot-dipped galvanized.

13. Strapping screws: 44 mm (1-3/4") ceramic-coated screws, or pre-approved equivalent.

2.6. Fastener Finishes

1. Galvanizing: to CAN/CSA-G164-M91, use galvanized fasteners for exterior work, plywood floor and wall sheathing, interior highly humid areas, and pressure-preservative or fire- retardant treated lumber.

2. Stainless steel: use stainless steel alloy for exterior applications near salt-water bodies.

2.7. Wood Preservative

1. Surface-applied wood preservative and chemical pressure treated wood to Section 06 05 73 – Wood Treatment.

3. EXECUTION

3.1. Preparation

1. Deliver and store wood products undamaged in clean, dry, well-ventilated area, off ground.

2. Prevent damage to materials during handling and storage.

3. Remove any deteriorated or damaged materials unsatisfactory for installation from the site.

3.2. Framing Installation

1. Comply with requirements of British Columbia Building Code Part 9 supplemented by following paragraphs.

2. Install members true to line, levels and elevations, square and plumb.

3. Construct continuous members from pieces of longest practical length.

4. Install spanning members with "crown-edge" up.

5. Select exposed framing for appearance. Install lumber and panel materials so that grade-marks and other defacing marks are concealed or are removed by sanding where materials are left exposed.

3.3. Furring, Blocking, Nailing Strips, Rough Bucks, Fascias, and Curbs

1. Install furring and blocking as required to space-out and support casework, cabinets, fixtures, hardware accessories, plumbing fixtures, mechanical service outlets, electrical service outlets, wall and ceiling finishes, facings, fascia, soffit, siding, electrical equipment mounting boards, and other work as required.

2. Ensure that blocking is provided to all grab bars and future grab bars throughout. Blocking to be 38x89 mm (2x4) framing and/or plywood securely anchored to withstand grab bar forces.

3. Provide blocking for future installation of grab bars at all bathtubs and toilets.

4. Provide blocking and backing in walls and partitions for all required hardware.

5. Install furring to walls to accommodate plumbing lines as required.

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

7. Install wood cants, fascia backing, nailers, curbs and other wood supports as required and secure using galvanized fasteners. Secure with galvanized 9 mm (3/8") bolts where indicated, 13 mm (1/2") bolts at steel beams, galvanized nails elsewhere.

    1. Locate fastenings within 300 mm (1'-0") from ends and uniformly spaced between. Space bolts at 1200 mm (4'-0") on centre and nails at 600 mm (2'-0") on centre except where indicated otherwise. Staple vapour retardant sheet strip continuous with 200 mm (8") overlap at joints, free of wrinkles and tears, with at least 200 mm (8") exposed for overlap on roof deck.

8. Install sleepers as indicated.

9. Restrict construction loads to design loads to prevent overstressing joists.

10. Install sill gaskets at all exterior wall plates in contact with concrete.

11. Install all welded steel door frames into wood framing as Work proceeds.

12. Notching and drilling must conform to Section 9.23.5 of the British Columbia Building Code, current edition. Any work that does not conform to this section will be rejected and replaced by the Contractor at no cost to the Owner.

3.4. Cavity Wall Strapping

1. Install strapping to support siding applied vertically where there is no blocking and where sheathing is not suitable for direct nailing.

    1. Install pressure treated plywood strapping as required to space-out and support exterior cladding as shown, spaced at 200 mm (8") on centre.

        1. Re-treat surfaces exposed by cutting, trimming or boring with liberal brush application of preservative before installation.

    2. Fasten strapping to sheathing not backed by studs with 44 mm (1-3/4") ceramic-coated screws spaced at 450 mm (1'-6") on centre. At locations backed by framing secure with 44 mm (1-3/4") ceramic-coated screws at 300 mm (1'-0") on centre.

    3. Align and plumb faces of furring and blocking to tolerance of 1:600.

3.5. Panel Installation

1. Install wall sheathing in accordance with manufacturer's printed instructions.

2. Install roof sheathing in accordance with requirements of British Columbia Building Code.

3. Install subflooring and combined subfloor and underlay with panel end-joints located on solid bearing, staggered at least 800 mm (2'-8").

1. In accordance with ULC Test M 506 fasten each panel with 51 mm (2”) spiral nails 30 mm (12”) on centre along support and 150 mm (6”) along the butt edges. Fasten plywood along all edges supported on framing, all joist blocking, along intermediate bearings and top and bottom plates of stud walls, unless shown otherwise on structural drawings. Staples are not permitted for the fastening of roof sheathing.

2. Secure subflooring to floor joists using 64 mm (1-1/2”) ring nails (refer to structural drawings for spacing) and subflooring adhesive. Place continuous adhesive bead in accordance with manufacturer's instructions, single-bead on each joist and double-bead on joists where panel ends butt.

3. End joints of plywood are to bear on supporting joists or studs and butt along their centre lines such that nail edge distance is not less than 9.5 mm (3/8”).

4. Use caution when working with particleboard products. Use dust collection and high quality respirator masks.

3.6. Miscellaneous Items

1. Install sill gaskets at all exterior wall plates in contact with concrete; butt edges tightly.

2. Install all welded steel doorframes into wood framing as Work proceeds.

3. Install joist hangers on joists where joists do not rest on framing or as detailed.

3.7. Electrical Equipment Backboards

1. Provide fire-resistant plywood backboards for mounting electrical equipment extending from floor to ceiling on 19 x 38 mm (1x2) furring around perimeter and at maximum 300 mm (1’-0”) intermediate spacing, to the extent indicated on the electrical drawings, and as specified in Division 26.

3.8. Surface-applied Wood Preservative

1. Treat all wood whose surfaces are in direct contact with concrete.

2. When treating wood surfaces with preservative apply preservative before installation.

3. Apply preservative by dipping, or by brush to completely saturate and maintain a wet film on the surface for a minimum three (3) minutes soak on lumber and one (1) minute soak on plywood.

4. Re-treat surfaces exposed by cutting, trimming or boring with liberal brush application of preservative before installation.

3.9. Erection

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

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

3. Use nailing disks for soft sheathing as recommended by sheathing manufacturer.

3.10. Schedules

1. Roof sheathing:

    1. Plywood, DFP or CSP sheathing square edge, 1/2” thick for sloped areas, 5/8” thick for flat roof areas or as indicated.

2. Exterior wall sheathing:

    1. Plywood, DFP or CSP sheathing, square edge, 1/2” thick or as indicated.

3. Subflooring:

1. Plywood, DFP or CSP sheathing T&G edge, 5/8” thick.

4. Electrical equipment mounting boards:

    1. Plywood, DFP or CSP grade, square edge, 3/4” thick.

3.11. Cleanup

1. During the progress of the Work, keep the job site free from any unnecessary accumulation of tools, equipment, surplus materials and debris.

2. As the work proceeds and upon completion of the work, promptly remove all waste material and used containers and leave the work neat and clean to the satisfaction of the Architect.

3. Place all waste lumber in bins provided by the General Contractor.

END OF SECTION

1. GENERAL

1.1. Summary

1. Refer to architectural drawings in conjunction with the specification.

1.2. Section Includes

1. This Section specifies wood decking materials and installation, as well as wood preservatives for these materials.

1.3. References

1. American Society for Testing and Materials (ASTM)
    1. ASTM D 5116-90, Standard Guide For Small-Scale Environmental Chamber Determinations of Organic Emissions From Indoor Materials/Products.
2. American Wood Preservers' Association (AWPA)
    1. AWPA A2-98, Standard Methods for Analysis of Water-borne Preservatives and Fire Retardant Formulations.
    2. AWPA A3-97, Standard Methods for Determining Penetration of Preservatives and Fire Retardants.
3. Canadian Standards Association (CSA)
    1. CSA B111-1974, Wire Nails, Spikes and Staples.
    2. CAN/CSA-O80 Series-M97, Wood Preservation.
    3. CAN/CSA-O80.20-M1997, Fire-Retardant Treatment of Lumber by Pressure Processes.
    4. CAN3-O86.1-M94, Engineering Design in Wood (Working Stress Design).
4. Environmental Choice Program (ECP)
    1. ECP-76-98, Water-bourne Surface Coatings.
5. Forest Stewardship Council Certification
6. National Lumber Grades Authority
    1. NLGA Standard Grading Rules for Canadian Lumber-1991.

1.4. Quality Assurance

1. Lumber identification: by grade stamp of an agency certified by Canadian Lumber Standards Accreditation Board.
2. Manufacturer Qualifications: Company specialized in deck installations with a minus of 5 years documented experience.
3. Installer Qualifications: Company specializing in performing deck installations with a minimum of 3 years documented experience.
4. Mock- Up: Provide a mock up of evaluation of surface preparation techniques and application workmanship
    1. Finish areas designated by Architect
    2. Do not proceed with remaining work until workmanship is approved by Architect

3. Refinish mock up area as required to product acceptable work

4. Accepted mock up shall be comparison standard for remaining work.

1.5. Waste Management and Disposal

1. Separate and recycle waste materials in accordance with [Section 01 74 19 - Construction Waste Management] and Waste Reduction Workplan, and Waste Management plan to maximum extent economically possible.

2. Separate wood waste in accordance with the Waste Management Plan and place in designated areas in categories as follows for recycling: [Solid wood/softwood/hardwood], [composite wood], [treated, painted, or contaminated wood].

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

4. Do not burn scrap at project site.

5. Unused preservatives and fire retardant materials are to be diverted from landfill through disposal at a special wastes depot.

1.6. Submittals

1. Section 01 33 00: Submission procedures.

2. Product Data: Manufacturers's data sheets on each product to be used, including:

    1. Preparation instructions and recommendations

    2. Storage and Handling requirements and recommendations

    3. Installation Methods

    4. Manufacturer's Certificates: certify product meet or exceed specified requirements

3. Selection Samples: For each finish product specified, provide two samples minimum size 6 inches long representing actual product and color.

1.7. Shop Drawings

1. Indicated deck framing system, loads and cambers, bearing details.

2. Design decking under direct supervision of Professional Engineer experienced in design of timber decks licensed in the province of British Columbia.

3. Submit shop drawings stamped and signed by professional engineer registered in the province of British Columbia, Canada.

1.8. FSC Submittals: documentation indicating manufacturer is FSC of Canada Chain of Custody certified

2. PRODUCTS

2.1. Materials

1. Wood decking: to NLGA standard Grading Rules for Canadian Lumber Commercial grade Western Red Cedar 38.1 x 139.7 mm, Kiln dry decking to 15% maximum moisture content.

2. Decking lengths: 1.8 to 6 m or longer with a minimum of 90% planks exceeding 3 m. Square end trimmed. For single spans shorter than 3 m use decking of same length as span.

3. Nails: to CSA B111, hot dipped galvanized finish; sizes as recommended in CAN3-O86. Supply 200 mm spiral spikes for lateral nailing.

4. Splines: galvanized metal, as recommended by decking Manufacturer.

5. Wood preservative: water borne type to CAN/CSA-O80 for natural finish.

3. EXECUTION

3.1. Installation

1. Do wood deck Work in accordance with CAN3-O86 except where specified otherwise.

2. Install decking in accordance with CAN3-O86, [simple span] [controlled random] [continuous over two span] pattern.

3. Provide minimum of one bearing support for each plank [except for cantilevers which shall extend over two supports]. Install sloping deck with tongues up. [Join butt ends with splines to assure tight square fit.]

4. Stagger end joints in adjacent planks minimum of 0.5 m. Separate joints in same area by at least two intervening courses. Avoid joints in first fifth of end spans. Minimize joints in middle third of any span.

5. Touch up end cuts with preservative where pressure treated lumber is specified.

3.2. Field Quality Control

1. Testing moisture content of delivered material will be performed by an independent testing laboratory.

2. The owner will pay for costs of testing in accordance with Section 01 45 00 Quality Control.

3.3. Cleaning

1. Remove tool marks, bruises, and scratches.

END OF SECTION

1. GENERAL

1.1. Summary

1. Refer to architectural drawings in conjunction with the specification.

1.2. Section Includes

1. Provide all labour, materials, tools and other equipment, services and supervision necessary for the complete supply and installation of all glue laminated construction indicated on the drawings and specified herein.

1.3. Related Sections

1. 05 50 00 - Metal Fabrications

1.4. Reference Standards

1. ASTM International
    1. ASTM A36/A36M-08, Standard Specification for Carbon Structural Steel.
    2. ASTM A47/A47M-99(2009), Standard Specification for Ferritic Malleable Iron Castings.
    3. ASTM A123/A123M-09, Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products.
    4. ASTM A307-10, Standard Specification for Carbon Steel Bolts and Studs, 60,000 PSI Tensile Strength.
    5. ASTM A653/A653M-11, Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
2. Canada Green Building Council (CaGBC)
    1. LEED Canada-NC-2009, LEED (Leadership in Energy and Environmental Design): Green Building Rating System for New Construction and Major Renovations 2009.
3. CSA International
    1. CSA B111-1974(R2003), Wire Nails, Spikes and Staples.
    2. CSA G40.20/G40.21-14(R2018), General Requirements for Rolled or Welded Structural Quality Steel/Structural Quality Steel.
    3. CAN/CSA O80 Series-15, Wood Preservation.
    4. CSA O86 Consolidation-14, Engineering Design in Wood.
    5. CSA O112.10-08, Evaluation of Adhesives for Structural Wood Products (Limited Moisture Exposure).
    6. CAN/CSA-O122-16, Structural Glued-Laminated Timber.
    7. CSA O177-06(R2015), Qualification Code for Manufacturer's of Structural Glued-Laminated Timber.
    8. CSA S16-14, Design of Steel Structures.
    9. CSA W47.1-11 (R2015), Certification of Companies for Fusion Welding of Steel Structures.
    10. CAN/CSA-Z809-08, Sustainable Forest Management.

4. Forest Stewardship Council (FSC)

    1. FSC-STD-01-001-2004, FSC Principle and Criteria for Forest Stewardship.

5. Green Seal Environmental Standards (GS)

    1. GS-11-11, Paints and Coatings.

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

    1. Material Safety Data Sheets (MSDS).

7. Society of Automotive Engineers International (SAE)

    1. SAE Handbook 2009.

9. Sustainable Forestry Initiative (SFI)

    1. SFI-2010-2014 Standard.

1.5. Action And Informational Submittals

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

2. Product Data:

    1. Submit manufacturer's instructions, printed product literature and data sheets for glued-laminated construction and include product characteristics, performance criteria, physical size, finish and limitations.

3. Shop Drawings:

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

    2. Submit erection drawings in accordance with CSA O86.

    3. Shop drawings for members: indicate stress grade, service grade and appearance grades, shop applied finishes, camber, cuts, ledgers, holes and connection details.

4. Manufacturer's Instructions: submit manufacturer's installation instructions and special handling criteria, installation sequence, cleaning procedures.

1.4. Quality Assurance

1. Qualifications:

    1. Manufacture structural glued-laminated members in plant certified by CSA as meeting requirements of CSA O177, class X.

    2. Fabricator for welded steel connections to be certified to CSA W47.1.

    3. Place authorization labels on glued-laminated members indicating manufactured in CSA certified plant.

    4. Certification of material protective sealer.

1.5. Delivery, Storage And Handling

1. Deliver, store and handle materials in accordance with Section with manufacturer's written instructions

2. Delivery and Acceptance Requirements:

1. Deliver materials to site in original factory packaging, labelled with manufacturer's name and address.
2. Apply protective sealer to glued-laminated units before shipping unless specified otherwise.
3. Wrap quality grade members prior to leaving plant with a moisture resistant wrapping.
4. Use padded, non-marring slings for handling glued-laminated members.
5. Protect corners with wood blocking.
6. Make adequate provision for delivery and handling stresses.

3. Storage and Handling Requirements:
    1. Store materials indoors and in accordance with manufacturer's recommendations in clean, dry, well-ventilated area.
    2. Slit underside of membrane covering during storage at site without defacing member.
    3. Store glued-laminated units and protect from weather, block off ground and separate with stripping, so air may circulate around faces of members.
    4. Cover glued-laminated units with opaque moisture resistant membrane if stored outside.
    5. Store and protect glue-laminated products from nicks, scratches, and blemishes.
    6. Replace defective or damaged materials with new.

2. PRODUCTS

2.1. Materials

1. Laminating stock: Douglas Fir-Larch to CAN/CSA-O122.
    1. CAN/CSA-Z809 or FSC or SFI certified.
2. Adhesive: to CSA O112.10, to grade of service required in accordance with CAN/CSA-O122.
    1. Urea-formaldehyde free.
3. Sealer for glued-laminated members: penetrating type, clear, non-yellowing liquid.
    1. Coatings: VOC limit 250 g/L maximum.
4. Fastenings:
    1. Lag screws: SAE J429 Grade 1 or better.
    2. Bolts: to ASTM A307.
    3. Side plates: to CSA G40.20/G40.21.
    4. Drift pins: to ASTM A307.
    5. Nails and spikes: to CSA B111.
5. Shop coat primer for steel connections: to MPI #18.

2.2. Fabrication

1. Fabricate members to following classifications:

1. Stress grade: to 24f-Ex bending grade.
2. Service grade: exterior.
3. Appearance grade: quality.

2. Mark laminated members for identification during erection. Marks not to be visible in final assembly.
3. Do not apply sealer to areas which are to receive stained finish or preservative treatment.
4. Design connections to CSA O86, and CSA S16 unless specifically detailed, to resist shears, moments and forces indicated.
    1. Fabricate in accordance with CSA S16.
5. Prime & Paint connections after fabrication.
    1. Anti-corrosive paint: VOC limit 250 g/L maximum to GS-03, 2nd Ed. 1997.

2.3. Factory Finishing

1. Applying sealer to areas to receive stained finish or preservative treatment is prohibited.
2. Apply two coats of approved stain. Provide sample in accordance with submittal requirements.
3. Prepare steel connection surfaces to applicable requirements of Section 05 50 00 – Metal Fabrications.
4. Prime paint connection steel after fabrication

3. EXECUTION

3.1. Examination

1. Verification of Conditions: verify conditions of substrates previously installed under other Sections or Contracts are acceptable for glue-laminated material installation in accordance with manufacturer's written instructions.
    1. Visually inspect substrate in presence of Consultant.
    2. Inform Consultant of unacceptable conditions immediately upon discovery.
    3. Proceed with installation only after unacceptable conditions have been remedied [and after receipt of written approval to proceed from Consultant.

3.2. Erection

1. Protect protective sealer from damage before erection.
    1. Touch up damaged areas on site with specified sealer and/or stain to make good.
2. Erect glued-laminated members in accordance with reviewed erection drawings.
3. Brace and anchor members until permanently secured by structure.
4. Make adequate provisions for erection stresses.
5. Splice and join only at locations as indicated on reviewed erection drawings.
6. Do not field cut or alter members.

3.3. Field Finishing

1. Apply one coat of approved stain.

3.4. Cleaning

1. Progress Cleaning: clean in accordance with Section 01 74 11 - Cleaning.
    1. Leave Work area clean at end of each day.
2. Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment in accordance with Section 01 74 11 - Cleaning.

3.5. Protection

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

END OF SECTION

1. GENERAL

1.1. Summary

1. Refer to architectural drawings in conjunction with the specification.

1.2. Section Includes

1. Baseboards, window and door trims.
2. Wood wall converings
3. Miscellaneous finish carpentry items.
4. Accessories.

1.3. Related Sections

1. Section 01 74 19 - Waste Management and Disposal. Section 06 10 00 – Rough Carpentry.
2. Section 09 90 00 - Painting and Coatings

1.4. References

1. AWMAC (North American Architectural Woodwork Standards including Errata through July 17, 2017).
2. CSA O141-05 (R2014) - Softwood Lumber.
3. CHPVA (Canadian Hardwood Plywood and Veneer Association) - Official Grading Rules for Canadian Hardwood Plywood.
4. NLGA (National Lumber Grades Authority) - Standard Grading Rules for Canadian Lumber, 2007 Edition.
5. NHLA (National Hardwood Lumber Association).
6. WCLIB (West Coast Lumber Inspection Bureau) - Standard Grading Rules for West Coast Lumber.
7. WWPA (Western Wood Products Association).

1.5. Administrative Requirements

1. Section 01 31 00: Project management and coordination procedures.
2. Coordination: Coordinate with other work having a direct bearing on work of this section.

1.6. Submittals

1. Section 01 33 00: Submission procedures.
2. Product Data: Provide data on fire retardant treatment materials and application instructions.
3. Shop Drawings:
    1. Prepare Shop Drawings under direct supervision of a Professional Structural Engineer experienced in design of this work and licensed in the Province of British Columbia, who will take responsibility for fabrication and erection of benches meeting all applicable codes.
    2. Indicate materials, component profiles, fastening methods, jointing details and accessories, to a minimum scale of 1:5 (1-1/2 inch to 1 ft).

3. Provide instructions for attachment hardware, finish hardware, and related accessories.

4. Installation Data: Provide manufacturer's special installation requirements.

5. Letters of Assurance: Submit Schedules S-B and S-C to the Registered Professional of Record:

6. Shop Drawing Stage: Submit a Schedule S-B “Assurance of Professional Design and Commitment for Field Review”.

7. After Completion of Field Reviews: Submit Schedule S-C “Assurance of Professional Field Review and Compliance”.

1.7. Quality Assurance

1. Perform Work in accordance with AWMAC manual, to Custom quality. Workmanship must conform to Part 6 of the Quality Standards for Architectural Woodwork as published by Architectural Woodwork Manufacturers Association of Canada (AWMAC), latest edition.

2. Fabricator Qualifications: A company specializing in manufacturing the Products specified in this Section with minimum five (5) years documented experience and be a member in good standing with AWMAC.

1.8. Delivery, Storage, and Handling

1. Deliver, handle, store and protect materials in accordance with Section [016100 - Basic Product Requirements].

2. Protect materials against dampness during and after delivery.

3. Store materials in ventilated areas, protected from extreme changes of temperature or humidity.

1.9. Waste Management and Disposal

1. Separate and recycle waste materials in accordance with [Section 01 74 19 - Construction Waste Management] and Waste Reduction Workplan, and Waste Management plan to maximum extent economically possible.

2. Separate wood waste in accordance with the Waste Management Plan and place in designated areas in categories as follows for recycling: [Solid wood/softwood/hardwood], [composite wood], [treated, painted, or contaminated wood].

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

4. Do not burn scrap at project site.

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

2. PRODUCTS

2.1. Lumber Material

1. Softwood lumber: unless specified otherwise, S4S, moisture content 19% or less in accordance with following standards:

    1. CAN/CSA O141.

    2. NLGA Standard Grading Rules for Canadian Lumber.

    3. AWMAC custom grade.

2.2. Components

1. Interior wall cladding at Studios
    1. Douglas Fir Plywood, Refinished No.C2 4’ x 8’. 1/2” thickness.
    2. Refer to Section 09 90 00 Paintings and Coatings for stain finish.
    3. Coordinate this work with Section 07 46 23 - Wood Siding. Refer to drawings for alignments.
2. Baseboards
    1. Douglas Fir
    2. Primed, 0.67” thick with profile to top edge. Baseboard height as per finishes schedule.
    3. Refer to drawings for finishes.
    4. Refer to Section 09 90 00 Paintings and Coatings for finish.
3. Door casings
    1. Douglas Fir
    2. Primed, 2 1/2" wide x 7/16” thick
    3. Refer to Section 09 90 00 Paintings and Coatings for finish.
4. Window sills
    1. Douglas Fir
    2. Primed, 1 1/4" thick
    3. Refer to Section 09 90 00 Paintings and Coatings for finish.
5. Window and door trims
    1. Douglas Fir
    2. 3/4” thick, width size as per drawings
    3. Refer to Section 09 90 00 Paintings and Coatings for finish.

2.3. Fastener Finishes

1. Size and type to suit application.
2. Stainless steel: use stainless steel alloy for exterior applications

3. EXECUTION

3.1. Preparation

1. Store wood products on job site in accordance with manufacturer's instructions. Prevent bending and warping.

3.2. Installation

1. Do finish carpentry to Quality Standards of the Architectural Woodwork Manufacturers Association of Canada (AWMAC), except where specified otherwise.

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

3. Comply with requirements of BCBC 2018.

4. Position items accurately. Install members true to line, levels and elevations, square and plumb.

5. Construct continuous members from pieces of longest practical length.

6. Provide all anchors, nails and blocking to secure millwork items

7. Coordinate with work of Section 09 90 00 Paintings and Coatings to ensure compatibility of finish systems.

3.3. Erection

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

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

3.4. Construction

1. Guardrails and garbage enclosure

    1. Refer to drawings for details.

    2. Fasten wood slats to top and bottom railings with fasteners designed for wood to aluminum or steel.

2. Standing and running trim.

    1. Butt and cope internal joints of baseboards to make snug, tight, joint. Cut right angle joints of casing and base with mitred joints.

    2. Fit backs of baseboards and casing snugly to wall surfaces to eliminate cracks at junction of base and casing with walls.

    3. Make joints in baseboard, where necessary using a 45° scarfe type joint.

    4. Install door and window trim in single lengths without splicing.

3. Interior and exterior frames.

    1. Set frames with plumb sides and level heads and sills and secure.

4. Shelving

    1. Install shelving on ledgers and shelf brackets as required.

3.5. Cleanup

1. During the progress of the Work, keep the job site free from any unnecessary accumulation of tools, equipment, surplus materials and debris.

2. As the work proceeds and upon completion of the work, promptly remove all waste material and used containers and leave the work neat and clean to the satisfaction of the Architect.

3. Place all waste lumber in bins provided by the General Contractor.

END OF SECTION

1. GENERAL

1.1. Section Includes

1. Provide all labour, materials, tools and other equipment, services and supervision required for the installation of bituminous dampproofing and air gap membrane where indicated on the drawings and as specified herein.

1.2. Related Sections

1. 03 30 00 - Cast-in-place Concrete
2. 07 92 10 - Joint Sealing

1.3. Submittals

1. Submit proof of manufacturer’s CCMC Listing and listing number to Consultant.
2. Submit proof of manufacturer’s ISO 9001 registration and compliance to Consultant.
3. Submit proof of manufacturer’s ISO 14001 registration and compliance to Consultant.
4. Submit proof of manufacturer’s participation certificate for Environmental Choice Program to Consultant.
5. Manufacturer's Instructions: Provide to indicate special handling criteria, installation sequence and cleaning procedures.

1.4. Product Data

1. Submit product data in accordance with Section 01 33 00 – Submittal Procedures.
2. Submit WHMIS MSDS - Material Safety Data Sheets in accordance with Section 01 35 30 – Health and Safety Requirements. WHMIS acceptable to Labour Canada, and Health and Welfare Canada.
3. Submit product data sheets for bituminous dampproofing products. Include:
    1. Product characteristics.
    2. Performance criteria.
    3. Application methods.
    4. Limitations.

1.5. Delivery, Storage And Handling

1. Provide and maintain dry, off-ground weather-proof storage.
2. Store materials on supports to prevent deformation.
3. Remove only in quantities required for same day use.
4. Store materials in accordance with manufacturer's written instructions.
5. Store cutback asphalt compounds at temperatures below 38°C (100°F)

1.6. Waste Management And Disposal

1. Separate and recycle waste materials in accordance with Section 01 74 19 – Construction Waste Management and Disposal.
2. Place materials defined as hazardous or toxic waste in designated containers.

3. Ensure emptied containers are sealed and stored safely for disposal away from children.

4. Collect and separate plastic, paper packaging and corrugated cardboard in accordance with Waste Management Plan.

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

6. Use the least toxic sealants, adhesives, sealer and primers necessary to comply with requirements of this section.

7. Close and seal, tightly, all partly used sealant and adhesive containers and store protected in well ventilated, fire-safe area at moderate temperature.

8. Place used hazardous sealant tubes and adhesive containers in areas designated for hazardous materials.

9. Collect, package and store part, unused containers of asphalt, sealing compounds and primers and their contents for recycling and return to recycler in accordance with Waste Management Plan.

1.7. Project/Site Environmental Requirements

1. Temperature, relative humidity, moisture content:

    1. Apply dampproofing materials only when surfaces and ambient temperatures are within manufacturers' prescribed limits.

    2. Do not proceed with work when wind chill effect would tend to set bitumen before proper curing takes place.

    3. Maintain air temperature and substrate temperature at dampproofing installation area above 5°C (41°F) for 24 hours before, during and 24 hours after installation.

    4. Do not apply dampproofing in wet weather.

    5. Do not apply to frosted or frozen surfaces.

    6. If rain or snow is anticipated, provide covering until coating is cured.

2. Safety: Comply with requirements of Workplace Hazardous Materials Information System (WHMIS) regarding use, handling, storage, and disposal of asphalt, sealing compounds, primers and caulking materials.

    1. Do not permit smoking, fires or open flame near open containers or freshly applied coatings.

3. Ventilation.

    1. Arrange for ventilation system to be operated during installation of dampproofing. Ventilate area of work as directed by Engineer by use of approved portable supply and exhaust fans.

    2. Provide continuous ventilation during and after dampproofing application. Run ventilation system 24 hours per day during installation; provide continuous ventilation for 7 days after completion of dampproofing installation.

1.8. Quality Control

1. All installers must be trained by the manufacturer of the product for installation of the particular product.

2. Building envelope consultant to review installation of dampproofing prior to backfilling.

2. PRODUCTS

2.1. Materials

1. Asphalt – for application and curing at temperatures above 5°C (41°F): to CAN/CGSB-37.2, CGSB 37-GP-6Ma, CAN/CGSB-37.16.

    1. Package label or bill of lading for bulk hot liquid asphalt must indicate type, flash point, equiviscous temperature range and final blowing temperature.

    2. Basis of design products: “700-01”, “710-11”, “810-07” by Henry; or pre-approved equivalent.

2. Asphalt – for application and curing at temperatures above 0°C (32°F) but below 5°C (41°F): to CAN/CGSB-37.16.

    1. Package label or bill of lading for bulk hot liquid asphalt must indicate type, flash point, equiviscous temperature range and final blowing temperature.

    2. Basis of design products: “710-11” by Henry; or pre-approved equivalent.

3. Sealing compound: plastic cutback asphalt cement to CAN/CGSB-37.5, rubberized asphalt type, compatible with dampproofing; free of toxic solvents; thick mastic consistency; smooth and uniform in composition; type recommended by dampproofing manufacturer.

    1. Basis of design products: “Sopramastic” by Soprema Inc,; “#703 Plastic Roof Cement” by Malarkey Roofing Company; “810-20”, “810-21” by Henry; or pre-approved equivalent.

4. Asphalt primer: to CGSB 37-GP-9Ma.

    1. Acceptable products: “Elastocol 350” by Soprema Inc.; “Aquatac”, “Aquaprime”, “900-34” by Henry; or pre-approved equivalent.

5. Protection board: mineral filled, high melt point asphalt core between non-woven fibre mats; or continually extruded flexible twin wall board made of polypropylene copolymer.

    1. Basis of design products: “Asphalt Protection Board 990-31” by Henry; or pre-approved equivalent.

6. Air gap membrane: dimpled high density polyethylene (HDPE) membrane for use around foundation walls below grade.

    1. Basis of design products: “Delta-MS” by Cosella Dörken; or pre-approved equivalent.

2.2. Compatibility

1. Ensure that all materials used are compatible, and provide proof of compatibility.

3. EXECUTION

3.1. Workmanship

1. Keep hot asphalt: Below its flash point, at or below its final blowing temperature and within its equiviscous temperature range at place of application.

3.2. Preparation

1. Before applying dampproofing:

    1. Seal exterior joints between foundation walls and footings, joints between concrete floor slab and foundation and around penetrations through dampproofing with sealing compound.

2. Do not proceed unless surfaces are acceptable. Commencement of work shall imply acceptance of surfaces. **Do not apply dampproofing to concrete that is already protected by crystalline waterproofing.**

3. New concrete should be cured for a minimum of 14 days and must be dry before dampproofing or air vapour barrier materials are applied.

4. Ensure all surfaces are firm, dry and free from frost, loose particles, cracks, pits, rough projections, grease, oil and other foreign matter detrimental to adhesion and monolithic application of dampproofing.

5. Remove loose particles and foreign matter with scraper, wire brush or other effective means. Remove grease or oil with a safety solvent, effective alkaline cleaner or detergent. If safety solvents are used, follow with an application of alkaline cleaner or detergent, then scrub surfaces clean with water.

6. Cut back form ties from face of concrete; fill resulting holes with cement mix.

7. Ensure all voids, holes, pockets and other concrete pour deficiencies are made good by the concrete subcontractor prior to proceeding with the work of this section.

3.3. Application

1. Do dampproofing in accordance with CAN/CGSB-37.3, CGSB 37-GP-12Ma, CGSB 37-GP-36M and CGSB 37-GP-37M except where specified otherwise. Provide application in two (2) coats.

2. Do sealing work in accordance with CGSB 37-GP-11M except where specified otherwise.

3. Do priming of surface in accordance with CGSB 37-GP-15M except where specified otherwise.

4. Apply primer.

5. Apply dampproofing in accordance with applicable CGSB application standard:

Material		Application
CAN/CGSB-37.2	use	CAN/CGSB-37.3
CGSB 37-GP-6Ma	use	CGSB 37-GP-12M
CAN/CGSB-37.16	use	CGSB 37-GP-36M
CAN/CGSB-37.28	use	CAN/CGSB-37.3
CSA A123.4	use	CGSB 37-GP-37M

6. Seal/caulk around items and services projecting through dampproofing surfaces. Apply in accordance with manufacturer’s recommendations. Ensure all sealed/caulked areas are moisture tight.

7. Protect dampproofing from damage prior to backfilling. Use protection board on horizontal surfaces prior to backfilling.

3.4. Schedule

1. Apply continuous, uniform coating to entire exterior faces of foundation walls (foundation beams) from finished grade level to and including tops of foundation wall footings.

2. Apply continuous, uniform coating to exterior side of foundation walls enclosing rooms below finished grade. Include exterior portion of interior walls where floors in adjacent rooms are at different elevations.

3. Apply two additional coats of dampproofing to vertical corners and construction joints for a minimum width of 250 mm (10”) on each side, and all around and for 250 mm (10”) along pipes passing through walls.

3.5. Air Gap Membrane

1. Install according to manufacturer’s instructions, where indicated.

3.6. Clean-up

1. Promptly as the work proceeds and on completion, clean up and remove from the job-site all rubbish, used containers and surplus materials resulting from the work of this section.

END OF SECTION

1. GENERAL

1.1. Summary

1. Refer to architectural drawings in conjunction with the specification.

1.2. Section Includes

1. The work in this section includes but is not limited to:
2. Installation of self adhesive membrane flashing at wall openings, penetrations and flashing.
3. Installation of membrane at other areas as noted on the drawings.

1.3. Related Sections

.1 01 33 00 - Submittal Procedures

.2 03 30 00 - Cast-in-place Concrete

.3 06 05 73 - Wood Treatment

.4 06 10 10 - Rough Carpentry

.5 07 61 00 - Sheet Metal Roofing

.6 07 62 00 - Sheet Metal Flashing and Trim

.7 07 92 10 - Joint Sealing

1. Submittals

1. Prior to commencing the Work, submit documentation from an approved independent testing laboratory certifying that the air leakage and vapour permeance rates of the air barrier membranes, including primary membrane and transition sheets, exceed the requirements of the BC Building Code.
2. Prior to commencing the Work submit copies of manufacturers' current ISO certification. Membrane, primers, sealants, adhesives and associated auxiliary materials shall be included.
3. Prior to commencing the Work submit references clearly indicating that the membrane manufacturer has successfully completed projects on an annual basis of similar scope and nature for a minimum of fifteen years. Submit references for a minimum of ten projects.
4. Prior to commencing the Work submit manufacturers' complete set of standard details for the air barrier membrane systems showing a continuous plane of air tightness throughout the building envelope.
5. Prior to commencing work provide material checklist complete with application rates & minimum thickness of primary membranes.

4. Product Data

1. Submit product data in accordance with Section 01 33 00 – Submittal Procedures.
2. Submit WHMIS MSDS – Material Safety Data Sheets in accordance with Section 01 35 30 – Health and Safety Requirements. WHMIS acceptable to Labour Canada, and Health and Welfare Canada. Indicate VOC content.
3. Submit product data sheets for system materials. Include product characteristics, performance criteria, and limitations.

5. Waste Management and Disposal

1. Separate and recycle waste materials in accordance with Section 01 74 19 – Construction Waste Management and Disposal.
2. Place materials defined as hazardous or toxic waste in designated, labelled containers.
3. Collect and separate plastic and/or paper packaging for recycling.

6. Projects/Site Environmental Requirements

1. Safety: Comply with requirements of Workplace Hazardous Materials Information System (WHIMS) regarding use, handling, storage and disposal of insulations materials.

7. Delivery, Storage and Handling

1. Handle and store in such a manner as to prevent damage; pile neatly on raised platform and protect with waterproof cover in dry waterproof building. Store role materials on end in original packaging.
2. Packaged materials shall have manufacture's labels and seals intact.
3. Store flammable materials outside the building. Abide by fire protection regulation of authority having jurisdiction.
4. Store adhesives and primers at temperatures of 5°C and above to facilitate handling.
5. Keep solvent away from open flame or excessive heat.
6. Protect rolls from direct sunlight until ready for use.

2. PRODUCTS

2.1 Self Adhesive Membrane and Primer

1.Self Adhesive Membrane Flashing at Typical Locations: Modified bitumen prefabricated sheet, self-adhesive face one side with released paper, reinforced with high density polyethylene surface film. The membrane must meet the following minimum criteria:

1. Thickness: 45 mils minimum.
2. Impermeable with foil face.
3. Acceptable Products:
    1. Protecto Seal 45 by Protecto Wrap
    2. Eternabond AlumiBond
    3. Alternatives as approved by Consultant.

2. Primer and sealant: as recommended by Membrane Manufacturer.

2.2 Self Adhesive Membrane and Primer

4. Self Adhesive Membrane Flashing Below Masonry as noted in the drawings: Modified bitumen prefabricated sheet, self-adhesive face one side with released paper, reinforced with high density polyethylene surface film. The membrane must meet the following minimum criteria:

    4.1.Thickness: 45 mils minimum.

4.2.Impermeable with foil face.

4.3.Acceptable Products:

4.4.Protecto Seal 45 by Protecto Wrap

4.5.Alternatives as approved by Consultant.

4.6.Primer and sealant: as recommended by Membrane Manufacturer.

2.3 Self Adhesive Membrane and Primer

2.1. Self Adhesive Membrane Flashing for high temperature applications: Modified bitumen prefabricated sheet, self-adhesive face one side with released paper, reinforced with high density polyethylene surface film. The membrane must meet the following minimum criteria:

1. Thickness: 40 mils minimum.
2. Impermeable.
3. Acceptable Products:
    1. Blueskin TWF
    2. IKO Aquabarrier TWF
    3. Alternatives as approved by Consultant.
4. Primer, surface conditioners and sealant: As recommended by Membrane Manufacturer compatible with substrates and adjacent materials including but not limited to the following;
    1. Metal substrates
    2. Concrete which may contain release agents.
    3. Wood substrates to which preservative or fire retardant treatment has been applied.

3. EXECUTION

3.1. Workmanship

1. Install membrane in accordance with manufactures recommendations.
2. Install insulation after building substrate materials are dry.
3. If water penetrates through the assembly due to inadequate protection, Contractor to cut and inspect damages, remove, replace and re-install all materials at his own cost, to eliminate water in the assembly.
4. The membrane must be watertight at the end of each shift. All exposed leading edges to be sealed at end of each work day.

3.2. Examination

1. Prior to commencing installation, verify governing dimensions of building and condition of substrate.

2. If substrate preparation is the responsibility of another installer, notify Consultant of unsatisfactory preparation before proceeding.

3. Proceeding with installation acknowledges acceptance of substrate.

3.3. Preparation

1. Examine, clean and repair as necessary any substrate conditions that would be detrimental to proper installation.

2. Do not begin installation until unacceptable conditions have been corrected.

3. Prepare surfaces using the methods recommended by the manufacturer for achieving the best results for the substrate under the project conditions.

4. Clean all surfaces to receive membrane of all debris and oils.

5. Primer Installation:

    1. Apply primer for self-adhering membranes at rate recommended by manufacturer.

3.4. Installation

1. Install membrane in accordance with Manufacturer's instructions.

2. Roll out sheets. Minimize wrinkles, fish-mouths and air pockets.

3. Remove release paper layer. Roll out on substrate with a mechanical roller to ensure complete adhesion to the substrate.

4. Lap sides and ends of membrane to adjacent materials in a shingled fashion with minimum 50mm in accordance with Manufacturer's instructions and project details.

5. Apply the membrane over the entire wall surface in a shingled fashion lapping horizontal joints 50mm and vertical joints 75mm. Make all joints watertight.

6. Seal items protruding or penetrating through the membrane using sealant approved by Manufacturer.

7. Seal all membrane seams with sealant as directed by Manufacturer's recommendations or as directed by Consultant.

8. When terminating membrane onto concrete substrate, seal leading edge of membrane with compatible sealant as recommended by manufacturer.

9. For locations where less than 2" lap onto concrete substrate is possible, provide termination bar along leading edge.

10. Ensure high temperature products are used below metal roof parapet cap flashings and other locations where potential for heat build-up is high.

11. Lap all self-adhered membrane a minimum 8" up vertical surfaces at horizontal to vertical interfaces.

3.5. Clean Up

1. At completion of work remove off site all excess materials and debris.

2. Leave site in clean neat condition.

3. Make good all defects to this installation or defects to other work caused by this site installation.

END OF SECTION

1. GENERAL

1.1. Summary

1. Refer to architectural drawings in conjunction with the specification.

1.2. Section Includes

1. Provide all labour, materials, tools and other equipment, services and supervision necessary for the installation of all board insulation as indicated on the drawings and as specified herein.

1.3. Submittals

1. Manufacturer's Instructions: Provide to indicate special handling criteria, installation sequence, and cleaning procedures.

1.4. Product Data

1. Submit product data in accordance with Section 01 33 00 – Submittal Procedures.

2. Submit WHMIS MSDS – Material Safety Data Sheets in accordance with Section 01 35 30 – Health and Safety Requirements. WHMIS acceptable to Labour Canada, and Health and Welfare Canada. Indicate VOC content.

3. Submit product data sheets for system materials. Include product characteristics, performance criteria, and limitations.

1.5. Waste Management and Disposal

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

2. Place materials defined as hazardous or toxic waste in designated, labelled containers.

3. Collect and separate plastic and/or paper packaging for recycling.

1.6. Projects/Site Environmental Requirements

1. Apply insulation only when surfaces and ambient temperatures are within Manufacturers' prescribed limits.

2. Safety: Comply with requirements of Workplace Hazardous Materials Information System (WHMIS) regarding use, handling, storage, and disposal of insulation materials.

3. Ventilation:

    1. Arrange for ventilation system to be operated during installation of insulation.

    2. Provide continuous ventilation during and after insulation application. Run ventilation system 24 hours per day during installation; provide continuous ventilation for 7 days after completion of insulation installation.

1.7. Delivery, Storage and Handling

1. Handle and store in such manner as to prevent damage; pile neatly on raised platform and protect with waterproof covers or store under cover in dry waterproof building.

2. Packaged materials shall have manufacturer's labels and seals intact.

3. Store flammable materials outside the building. Abide by fire protection regulation of authorities having jurisdiction.

2. PRODUCTS

2.1. Insulation

1. Rigid extruded polystyrene (XPS): to CAN/ULC-S701.
    1. Under concrete slab insulation: type 4, thermal resistance RSI0.87/25.4 mm (R5.0/inch), compressive strength 210 kPa (30 psi), thickness as indicated, shiplapped edge.
        1. Basis of Design Products: PlastiSpan PlanstiSpan HD
        2. Acceptable Alternate: Basis of design products: “Styrofoam Perimate” by DuPont., or pre-approved equivalent.
    2. Below-grade perimeter and above grade insulating sheathing: to CAN/ULC-S701, type VI, thermal resistance RSI0.87/25.4 mm (R5.0/inch), compressive strength 210 kPa (30 psi), thickness as indicated, shiplapped edge.
        1. Basis of design products: “Wallguard Concrete Faced Insulated Perimeter Wall Panels” by T Clear, or pre-approved equivalent.

2.2. Adhesive

1. Adhesive for bonding polystyrene to porous substrates: to CGSB 71-GP-24, Type II.
    1. Basis of design products: Soprema Sopraseal LM 200T
    2. Acceptable Alternate: “Sonneborn 200”, by Degussa; “230-21” by Henry; “LePage PL 300” by LePage; or pre-approved equivalent.

2.3. Accessories

1. Insulation clips: impale type, perforated 50 x 50 mm (2” x 2”) cold rolled carbon steel 0.8 mm (1/32”) thick, adhesive back, spindle of 2.5 mm (3/32”) diameter annealed steel, length to suit insulation, 25 mm (1”) diameter washers of self locking type.

3. EXECUTION

3.1. Workmanship

1. Install insulation after building substrate materials are dry.
2. Install insulation to maintain continuity of thermal protection to building elements and spaces.
3. Fit insulation tight around electrical boxes, plumbing and heating pipes and ducts, around exterior doors and windows and other protrusions.
4. Keep insulation minimum 75 mm (3”) from heat emitting devices such as recessed light fixtures, and minimum 50 mm (2”) from sidewalls of CAN4-S604 type A chimneys and CAN/CGA-B149.1 and CAN/CGA-B149.2 type B and L vents.
5. Cut and trim insulation neatly to fit spaces. Butt joints tightly, offset vertical joints. Use only insulation boards free from chipped or broken edges. Use largest possible dimensions to reduce number of joints.
6. Offset both vertical and horizontal joints in multiple layer applications.
7. Ensure backfill material does not migrate behind insulation panels, causing voids and pockets between insulation panels and concrete substrate.
8. Do not enclose insulation until it has been inspected and approved by pertinent consultants.

3.2. Examination

1. Examine substrates and immediately inform pertinent consultants in writing of defects.

2. Prior to commencement of work ensure substrates are firm, straight, smooth, dry, free of snow, ice or frost, and clean of dust and debris.

3.3. Rigid Insulation Installation

1. Apply Type II adhesive to polystyrene, urethane, or mineral fibre insulation board by in accordance with Manufacturer's recommendations.

2. Imbed insulation boards into vapour barrier type adhesive, applied as specified, prior to skinning of adhesive.

3. In addition to adhesive, install mineral fibre insulation boards with insulation clips and disk, 2 per 600 x 1200 mm (2'-0" x 4'-0") board minimum, fit boards tight, cut off fastener spindle 3 mm (1/8") beyond disk.

4. Leave insulation board joints unbonded over line of expansion and control joints. Bond a continuous 150 mm (6") wide 0.15 mm (6 mil) polyethylene strip over expansion and control joints using compatible adhesive before application of insulation.

3.4. Perimeter Foundation Insulation

1. Exterior application: extend boards as indicated. Install on exterior face of perimeter foundation wall with adhesive.

2. Under slab application: extend boards as indicated. Lay boards on level compacted fill.

3.5. Cavity Wall Installation

1. Install mineral fibre insulation boards on outer surface of wall cavity over impaling clips OR on bed of adhesive.

3.6. Clean-up

1. Promptly as the work proceeds and on completion, clean up and remove from the job-site all rubbish, used containers and surplus materials resulting from the work of this Section.

END OF SECTION

1. GENERAL

1.1. Summary

1. Refer to architectural drawings in conjunction with the specification.

1.2. Section Includes

1. Provide all labour, materials, tools and other equipment, services and supervision necessary for the installation of all blanket insulation as indicated on the drawings and as specified herein.

1.3. Submittals

1. Manufacturer's Instructions: Provide to indicate special handling criteria, installation sequence, cleaning procedures.

1.4. Product Data

1. Submit product data in accordance with Section 01 33 00 – Submittal Procedures.

2. Submit WHMIS MSDS – Material Safety Data Sheets in accordance with Section 01 35 30 – Health and Safety requirements. WHMIS acceptable to Labour Canada, and Health and Welfare Canada. Indicate VOC content.

3. Submit product data sheets for system materials. Include product characteristics, performance criteria, and limitations.

1.5. Waste Management and Disposal

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

2. Place materials defined as hazardous or toxic waste in designated, labelled containers.

3. Collect and separate plastic and/or paper packaging for recycling.

1.6. Projects/Site Environmental Requirements

1. Apply insulation only when surfaces and ambient temperatures are within Manufacturers' prescribed limits.

2. Safety: Comply with requirements of Workplace Hazardous Materials Information System (WHMIS) regarding use, handling, storage, and disposal of insulation materials.

3. Ventilation:

    1. Arrange for ventilation system to be operated during installation of insulation.

    2. Provide continuous ventilation during and after insulation application. Run ventilation system 24 hours per day during installation; provide continuous ventilation for 7 days after completion of insulation installation.

4. Protection:

    1. Provide temporary enclosures to prevent dust from contaminating air beyond application area.

    2. Protect adjacent surfaces and equipment from damage by fall-out, and dust.

1.7. Delivery, Storage and Handling

1. Handle and store in such manner as to prevent damage; pile neatly on raised platform and protect with waterproof covers or store under cover in dry waterproof building.

2. Packaged materials shall have manufacturer's labels and seals intact.

3. Store flammable materials outside the building. Abide by fire protection regulation of authorities having jurisdiction.

2. PRODUCTS

2.1. Insulation

1. Batt and blanket glass fibre: to CAN/ULC-S702, type I, thickness and R-value as indicated.

    1. Basis of design products: Owens Coring Quietzone Pink NextGen Fiberglass Insulation

    2. Acceptable Alternate: "ComfortTherm", "Unfaced Batts", "Kraft & Foil-faced Batts" by Johns Manville; "EcoTouch Pink Fiberglas" by Owens Corning; or pre-approved equivalent.

2. Neoprene Foam Tape: 9 x 19 mm (3/8" x 3/4") wide.

2.2. Accessories

1. Tape: as recommended by manufacturer.

3. EXECUTION

3.1. Insulation Installation

1. Insulation not to be installed until building has been made substantially water- and weather-tight.

2. Insulate all areas in such a way as to include all breaks, corner pockets, voids, offsets and architectural features necessary to ensure a complete continuous insulation of the entire building. Install insulation to maintain continuity of thermal protection to building elements and spaces. Install friction-fit batt insulation in floor and wall locations as indicated.

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

4. Cut batts slightly oversized to give a tight fit in non-standard spaces. Do not compress insulation to fit into spaces.

5. Keep insulation minimum 75 mm (3") from heat emitting devices such as recessed light fixtures, and minimum 50 mm (2") from sidewalls of CAN/ULC-S604 Type A chimneys and CAN/CGA-B149.1 and CAN/CGA-B149.2 Type B and L vents.

6. Do not enclose insulation until it has been inspected and approved by Consultant

3.2. Clean-up

1. Promptly as the work proceeds and on completion, clean up and remove from the job-site all rubbish, used containers and surplus materials resulting from the work of this Section.

END OF SECTION

1. GENERAL

1. Summary

1. Refer to architectural drawings in conjunction with the specification.

2. Section Includes

1. The work in this section includes but is not limited to:

1.1. Supply and installation of new vapour permeable sheet applied sheathing membrane over the wood sheathing substrate. The sheathing membrane will be installed as the moisture barrier as well as to improve the air tightness of the wall system.

3. Related Sections

.1 03 30 00 - Cast-in-place Concrete

.2 06 10 10 - Rough Carpentry

.3 07 21 13 - Board Insulation

.4 07 61 00 - Sheet Metal Roofing

.5 07 62 00 - Sheet Metal Flashing and Trim

.6 07 92 10 - Joint Sealing

.7 09 21 16 - Gypsum Board Assemblies

4. Submittals

1. Prior to commencing the Work, submit documentation from an approved independent testing laboratory certifying that the air leakage and vapour permeance rates of the air barrier membranes, including primary membrane and transition sheets, exceed the requirements of the BC Building Code.

2. Prior to commencing the Work submit copies of manufacturers' current ISO certification. Membrane, primers, sealants, adhesives and associated auxiliary materials shall be included.

3. Prior to commencing the Work submit references clearly indicating that the membrane manufacturer has successfully completed projects on an annual basis of similar scope and nature for a minimum of fifteen years. Submit references for a minimum of ten projects.

4. Prior to commencing the Work submit manufacturers' complete set of standard details for the air barrier membrane systems showing a continuous plane of air tightness throughout the building envelope.

5. Prior to commencing work provide material checklist complete with application rates & minimum thickness of primary membranes.

3. Product Data

1. Submit product data in accordance with Section 01 33 00 – Submittal Procedures.

2. Submit WHMIS MSDS – Material Safety Data Sheets in accordance with Section 01 35 30 – Health a nd Safety Requirements. WHMIS acceptable to Labour Canada, and Health and Welfare Canada. Indicate VOC content.

3. Submit product data sheets for system materials. Include product characteristics, performance criteria, and limitations.

4. All treated lumber and plywood shall bear an identifying stamp in accordance with the CWPB requirements.

4. Waste Management and Disposal

1. Separate and recycle waste materials in accordance with Section 01 74 10 – Construction Waste Management and Disposal.
2. Place materials defined as hazardous or toxic waste in designated, labelled containers.
3. Collect and separate plastic and/or paper packaging for recycling.

5. Projects/Site Environmental Requirements

1. Safety: Comply with requirements of Workplace Hazardous Materials Information System (WHIMS) regarding use, handling, storage and disposal of insulations materials.

6. Delivery, Storage and Handling

1. Handle and store in such a manner as to prevent damage; pile neatly on raised platform and protect with waterproof cover in dry waterproof building. Store role materials on end in original packaging.
2. Packaged materials shall have manufacture's labels and seals intact.
3. Store flammable materials outside the building. Abide by fire protection regulation of authority having jurisdiction.
4. Store adhesives and primers at temperatures of 5°C and above to facilitate handling.
5. Keep solvent away from open flame or excessive heat.
6. Protect rolls from direct sunlight until ready for use.

2. PRODUCTS

2.1 Sheathing Membrane and Primer

1. Primary membrane: self-adhered vapour permeable sheet membrane. Acceptable product:
    1. DuPont Tyke CommercialWrap
    2. Sopraseal Stick VP by Soprema
    3. Blueskin VP 160 by Henry
    4. IKO Aquabarrier VP
    5. Alternatives as approved by Consultant.
2. Primer and sealant: as recommended by Membrane Manufacturer.

3. Execution

3.1. Workmanship

1. Install membrane in accordance with manufactures recommendations.
2. Install insulation after building substrate materials are dry.

3.2. Examination

1. Prior to commencing installation, verify governing dimensions of building and condition of substrate.
2. If substrate preparation is the responsibility of another installer, notify Consultant of unsatisfactory preparation before proceeding.
3. Proceeding with installation acknowledges acceptance of substrate.

3.3. Preparation

1. Examine, clean and repair as necessary any substrate conditions that would be detrimental to proper installation.
2. Do not begin installation until unacceptable conditions have been corrected.
3. Prepare surfaces using the methods recommended by the manufacturer for achieving the best results for the substrate under the project conditions.
4. Clean all surfaces to receive membrane of all debris and oils.
5. Primer Installation:
    1. Apply primer for self-adhering membranes at rate recommended by manufacturer.

3.4. Installation

1. Install membrane in accordance with Manufacturer’s instructions.
2. Roll out sheets. Minimize wrinkles, fish-mouths and air pockets.
3. Remove release paper layer. Roll out on substrate with a mechanical roller to ensure complete adhesion to the substrate.
4. Lap sides and ends of membrane to adjacent materials in a shingled fashion with minimum 50mm in accordance with Manufacturer’s instructions and project details.
5. Apply the membrane over the entire wall surface in a shingled fashion lapping horizontal joints 50mm and vertical joints 75mm. Make all joints watertight.
6. Seal items protruding or penetrating through the membrane using sealant approved by Manufacturer.
7. Seal all membrane seams with sealant as directed by Manufacturer’s recommendations or as directed by Consultant.
8. When terminating membrane onto concrete substrate, seal leading edge of membrane with compatible sealant as recommended by manufacturer.
9. For locations where less than 2” lap onto concrete substrate is possible, provide termination bar along leading edge.

3.5. Clean Up

1. At completion of work remove off site all excess materials and debris.
2. Leave site in clean neat condition.
3. Make good all defects to this installation or defects to other work caused by this site installation.

END OF SECTION

1. GENERAL

1.1. Summary

1. Refer to architectural drawings in conjunction with the specification.

1.2. Section Includes

1. Provide all labour, materials, tools and other equipment, services and supervision required for the installation of sheet vapour retarders as indicated on the drawings and as specified herein.

1.3. Related Sections

1. 03 30 00 - Cast-in-place Concrete
2. 06 10 10 - Rough Carpentry
3 . 07 92 10 - Joint Sealing
4 . 08 11 14 - Metal Doors and Frames
5. 09 21 16 - Gypsum Board Assemblies

1.4. Product Data

1. Submit product data in accordance with Section 01 33 00 – Submittal Procedures.

2. Submit WHMIS MSDS – Material Safety Data Sheets in accordance with Section 01 35 30 – Health and Safety Requirements. WHMIS acceptable to Labour Canada, and Health and Welfare Canada.

3. Submit product data sheets for sheet vapour retarders. Include product characteristics, performance criteria and limitations.

1.5. Mock-Ups

1. Submit mock-ups in accordance with Section 01 45 00 – Quality Control.

2. Construct mock-up of sheet vapour barrier installation including one lap joint, one inside corner and at one electrical box. Mock-up may be part of finished work.

3. Allow 48 hours for inspection of mock-up by Engineer or Consultant before proceeding with vapour barrier work.

1.6. Waste Management and Disposal

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

2. Place materials defined as hazardous or toxic waste in designated containers.

3. Ensure emptied containers are sealed and stored safely for disposal away from children.

4. Collect and separate plastic, paper packaging and corrugated cardboard in accordance with Waste Management Plan.

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

6. Use the least toxic sealants and adhesives necessary to comply with requirements of this section.

7. Close and seal, tightly, all partly used sealant and adhesive containers and store protected in well ventilated, fire-safe area at moderate temperature.

8. Place used hazardous sealant tubes and adhesive containers in areas designated for hazardous materials.

9. Collect, package and store polyethylene cut offs and waste material for recycling in accordance with Waste Management Plan.

2. PRODUCTS

2.1. Sheet Vapour Barrier

1. Polyethylene film: to CAN/CGSB-51.34, 0.15 mm (6 mil) and 0.25 mm (10 mil) thick.

2. For sheet weather barriers at exterior walls, refer to Section 07 46 23 - Wood Siding, and Section 07 46 46 - Mineral Fibre Cement Siding.

3. For sheet vapour retarders at roof, refer to Section 07 61 00 - Sheet Metal Roofing, and Section 07 62 00 Sheet Metal flashing and trims.

4. Polyethylene sheet under interior concrete slabs

2.2. Accessories

1. Joint sealing tape: air resistant pressure sensitive adhesive tape, type recommended by vapour barrier manufacturer, 50 mm (2”) wide for lap joints and perimeter seals, 25 mm (1”) wide elsewhere.

2. Sealant: to Section 07 92 10 – Joint Sealing; minimum 12 mm (1/2”) bead diameter.

3. Staples: minimum 6 mm (1/4”) leg.

4. Moulded box vapour barrier: factory-moulded polyethylene box for use with recessed electric switch and outlet device boxes.

3. EXECUTION

3.1. Installation

1. Ensure services are installed and inspected prior to installation of retarder.

2. Install sheet vapour retarder on warm side of exterior wall and ceiling assemblies prior to installation of gypsum board to form continuous retarder. Install vapour retarder strips between all interior framing and exterior framing including sealant, to form an unbroken vapour retarder.

3. Install sheet vapour retarder under slab on grade installations as indicated.

4. Use sheets of largest practical size to minimize joints.

5. Inspect for continuity. Repair punctures and tears with sealing tape before work is concealed.

3.2. Exterior Surface Openings

1. Cut sheet vapour retarder to form openings and ensure material is lapped and sealed to frame.

3.3. Perimeter Seals

1. Seal perimeter of sheet vapour barrier as follows:

    1. Apply continuous bead of sealant to substrate at perimeter of sheets.

    2. Lap sheet over sealant and press into sealant bead.

    3. Install staples through lapped sheets at sealant bead into wood substrate.

    4. Apply continuous bead of sealant to all head and sill plates. Ensure that no gaps exist in sealant bead. Smooth out folds and ripples occurring in sheet over sealant.

3.4. Lap Joint Seals

1. Seal lap joints of sheet vapour barrier as follows:
    1. Attach first sheet to substrate.
    2. Apply continuous bead of sealant over solid backing at joint.
    3. Lap adjoining sheet minimum 150 mm (6”) and press into sealant bead.
    4. Install staples through lapped sheets at sealant bead into wood substrate.
    5. Ensure that no gaps exist in sealant bead. Smooth out folds and ripples occurring in sheet over sealant.

3.5. Penetrations

1. Seal electrical switch and outlet device boxes that penetrate vapour barrier as follows:
    1. Install moulded box vapour barrier. Wrap boxes with film sheet providing minimum 300 mm (1’-0”) perimeter lap flange.
    2. Apply sealant to seal edges of flange to main vapour barrier and seal wiring penetrations through box cover.
2. Seal other penetrations as follows:
    1. Seal all around any pipes, fixtures, ductwork, etc., penetrating the vapour barrier.

3.6. Clean-up

1. As the Work proceeds and at the completion of sheet vapour retarder installation, promptly remove waste and excess material off site; repair and make good defects to this application or defects to other work caused by this application.

END OF SECTION

1. GENERAL

1.1. Summary

1. Refer to architectural drawings in conjunction with the specification.

1.2. Section Includes

1. Provide all labour, materials, tools and other equipment, services and supervision required for the installation of building paper, self-healing flashing membrane, vertical pressure treated cavity-wall strapping, and fibre-cement siding (associated trims, flashings, and accessories) and soffit material as indicated on the drawings and as specified herein.

2. Installation of air barrier to all exterior sheathing under fibre-cement siding, including cutting and fitting around all openings. Refer to Part 3 of this Section for special requirements around openings and penetrations.

3. Installation of self-adhesive flashing membrane around windows and doors as detailed in the drawings and described herein. Self-adhesive flashing membrane to also be installed over the tops of all up-stand walls (under metal flashing) and at each up-stand's connection to adjacent vertical wall surfaces so as to form a watertight connection.

4. Installation of one (1) layer of self-adhesive flashing membrane lapped in sequence around all other exterior openings, including vents, grilles, piping, hose bibs, light fixture rough-in, etc.

5. Installation of pressure treated vertical strapping to wall surfaces to form a cavity between the siding and the building paper, and including perforated aluminum insect screens at all open ends of the cavities.

6. Installation of fibre-cement siding and soffit material to wall and soffit surfaces as well as three dimensional shapes; installation of perforated aluminum soffit strip venting, finish coat colours to be as shown on the drawings and as specified.

7. Coordination of all work with the work of other sections including embedded items, openings, flashings and sealants.

1.3. Related Sections

1. 06 05 73 - Wood Treatment
2. 06 10 10 - Rough Carpentry
3. 07 62 00 - Sheet Metal Flashing and Trim
4. 07 92 10 - Joint Sealing

1.4. Submittals

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

2. Submit three (3) 150 x 150 mm (6" x 6") pieces of fibre-cement claddings in texture and widths shown and specified herein. Submit samples with finish coatings.

3. Submit three copies of specifications, installation data and other pertinent manufacturer's literature.

4. Submit WHMIS MSDS – Material Safety Data Sheets in accordance with Section 01 35 30 – Health and Safety Requirements. WHMIS acceptable to Labour Canada, and Health and Welfare Canada. Indicate VOC content.

5. Submit shop drawings under seal of a Professional Engineer registered in British Columbia. The shop drawings must meet the following criteria:

    1. Show attachment to building. Identify all structural fasteners.

2. Submit Schedule S-B “Assurance of Professional Design and Commitment for Field Review” ” in accordance with the appropriate codes together with shop drawings.

3. Submit Schedule S-C “Assurance of Professional Field Review and Compliance” promptly on completion of work.

1.5. Mockups

1. Mockups are required for all penetration types, including, but not limited to louvers, vents, electrical device boxes, pipes and transitions between cladding material types.

2. Provide (1) mockup for each of the type of cementitious fibre wall assemblies. Refer to drawings. Consultant to approve location and size of mock-up.

3. Do not proceed with remaining work until workmanship is approved by Architect.

4. Accepted mock up shall be comparison standard for remaining work.

1.6. Product Delivery, Storage and Handling

1. Deliver and store material undamaged in original unopened packages, clearly marked with the manufacturer’s name, brand name, and description of contents. Store in a clean, dry, well ventilated area, off the ground.

2. Protect materials from sunlight, and keep away from excessive heat. Prevent damage to materials during handling and storage. Stack fibre-cement claddings on edge or lay flat on a smooth, level surface. Protect edges and corners from chipping. Store sheets under cover and keep dry prior to installing.

3. Remove any deteriorated or damaged materials unsatisfactory for installation from the site.

1.7. Job Conditions

1. 38 x 89 mm (nominal 2x4) wood framing selected for minimal shrinkage and complying with local building codes, including the use of weather-resistive barriers and/or vapour barriers where required. Minimum 38 mm (1-1/2”) face and straight, true, of uniform dimensions and properly aligned.

2. Install weather-resistive barriers and claddings to dry surfaces.

3. Repair any punctures or tears in the weather-resistive barrier prior to the installation of the siding.

4. Protect siding from other trades.

1.8. Warranty

1. Limited product warranty against manufacturing defects in lap and vertical siding for fifty (50) years, shingles for thirty (30) years and trim for ten (10) years.

2. Factory sealed/primer and pre-painted finish: fifteen (15) year labour and material warranty on factory applied coating system.

3. Workmanship: application limited warranty for two (2) years.

1.9. Quality Assurance

1. Install fibre-cement cladding in accordance with CGSB 11-GP-6M and Section 9.27 of the BC Building Code.

2. PRODUCTS

2.1. Materials

1. Fibre-Cement Cladding:

1. Non-asbestos fibre-cement siding to comply with ASTM Standard Specification C1186 Grade II, Type A.

2. Non-asbestos fibre-cement siding to be non-combustible when tested in accordance with ASTM test method E136.

3. All fibre-cement products to have a smooth finish. Any finish other than smooth will be rejected by the Consultant.

4. Durability: In accordance with manufacturer's specifications

    1. Will not rot and will resist permanent damage from water and salt spray.

    2. Flexural strength: In accordance with ASTM-C1185 "Standard Test Method for Sampling and Testing Non-Asbestos Fiber-Cement Flat Sheet, Roofing and Siding Shingles, and Clapboards".

    3. Non-combustibility: In accordance with ASTM-E136 "Standard Test Method for Behavior oF Materials in a Vertical Tube Furnace at 750 C".

    4. Surface burning capabilities: In accordance with ASTM-E84 "Standard Test Method for Surface Burning Characteristics of Building Materials".

5. Fibre-Cement Panel:

    1. 48" W x 96" H fibre-cement panel; 11 mm (7/16") thickness, installed in sizes as shown on the drawings.

    2. Acceptable Product: James Hardie Building Products "Hardipanel" siding; or pre-approved equivalent. Refer to drawings for colour. Surface Texture: Smooth . Iron Gray.

6. Fibre-Cement Panel:

    1. 1200 x 3000 mm (4'-0" x 10'-0") fibre-cement panel, 8 mm (5/16") thickness, installed in sizes as shown on the drawings.

    2. Acceptable Product: James Hardie Building Products "Hardipanel® c/w ColourPlus® technology" siding; or pre-approved equivalent. Refer to drawings for colour. Surface Texture: Smooth, pre primed for painting.

    3. Colour: Dark grey (Sherwin Williams SW 7069 - Iron Ore).

2. Fasteners for Fibre-Cement Cladding

1. Fasteners shall be of high quality stainless steel to ensure resistance to corrosion.

    1. Alternatives must be approved by the architect. e.g. decorative screws, nails, bugle head screws, and similar items.

2. Wood framing: 38mm (1-1/2") "TW-S 300 series stainless steel cladding fastener" by SFS intec Inc. colour matched to panel.

3. Metal framing: 32 mm (1-1/4") No. 8-18 x 9.5 mm (0.375") head self-drilling, corrosion resistant S-12 ribbed buglehead screws.

4. Concrete Walls: Erico Stud Nail, ET&F ASM No.-144-125, 3.5 mm (0.14") shank x 7.5 mm (0.30") head x 51 mm (2") corrosion resistant nail.

5. For 7/16" panel siding use Countersunk Screws: No. 8 by 0.39 inch head diameter. Patch as er manufacturer's "Reveal Panel System" Installation Instructions

3. Self-Adhesive Flashing Membrane (sills)

1. Membrane Flashing: minimum 1.0 mm (40 mil) thick sheet of self adhering, self healing, composite rubberized asphalt having a minimum membrane tensile strength of 177 N/25 mm (40 lb/in), minimum peel adhesion of 8 N/cm to ASTM D903, and a maximum permeance of 2.25 ng/Pa•s•m^2 (0.001 perms) to ASTM E96.

2. Acceptable Products: "Lastobond Stick HT" by Soprema, or pre-approved equivalent. Product to be supplied with the appropriate wood primer and primer cleaner as recommended by the manufacturer.

4. Self-Adhesive Flashing Membrane (vertical surfaces)

1. Membrane Flashing: minimum 0.6mm (24mil) thick sheet of self adhering, self healing, composite rubberized asphalt having a maximum permeance of 0.0025 L/s•m^2 to ASTM E96, and a water vapour transmission of 629 ng/Pa•s•m^2 (11 perms) to ASTM 96A.

2. Basis of design product: "Sopraseal Stick VP" by Soprema, or pre-approved equivalent. Product to be supplied with the appropriate wood primer and primer cleaner as recommended by the manufacturer.

5. Window, Door and Penetration Head Flashing

1. Refer to Section 07 26 00 - Sheet Metal Flashing and Trim

6. Vertical Pressure-Treated Strapping and Insect Screen

1. Vertical pressure treated strapping: apply over the air barrier at intervals as shown on the drawings.

2. Insect screen: aluminum sheet bent to shape as shown on the drawings and perforated with staggered 2.38 mm (3/32") holes.

3. EXECUTION

3.1. Examination and Preparation

1. Examine the condition and continuity of all underlayment prior to commencing the work of this section. Notify the General Contractor and Architect in writing of any surfaces that will adversely affect the performance or appearance of the Work, and that will require repair or completion.

2. Commence Work only when all such adverse conditions and defects have been corrected and surfaces and conditions are acceptable. Commencement of Work in this Section implies acceptance of the existing underlayment conditions.

3. Ensure lath, furring, accessories and trim are tight and fastened securely in place and that fixtures, conduits, piping, cables, outlets and other structural, mechanical or electrical penetrations are properly plugged, capped, or covered before commencing panel application.

3.2. Installation of Vertical Pressure Treated Strapping

1. Install vertical pressure treated strapping as indicated on drawings.

3.3. Installation of Fibre-Cement Panel Siding

1. Install siding in accordance with manufacturer's application manual. Special details shown in the drawings shall be included as part of the installation procedure.
2. Install interior/exterior corners, and closure strips. Form and profile work to ensure proper shedding of surface water. Refer to design drawings for specific installation requirements. Follow manufacturer's specifications.
3. Ensure joints are properly protected, true to line and tight fitting.
4. Attach components in manner not restricting thermal movement. Conceal fasteners where possible.
5. Protect surfaces with metals in contact with cementitious siding with isolation tape.
6. Seal all cut edges of siding with primer and paint. Touch up with paint.
7. Seal siding junctions with sealant. Back butt joints with sections of metal flashing or building paper.
8. Upon completion, clean as necessary to remove all fingerprints and soiled areas. Clean and remove all scrap, packaging and unused materials.
9. Install all flashing, membrane and other details in accordance with the drawings.
10. Install windows and window accessories prior to installation of siding.
11. Provide ¼" to ½" joint spacing at the perimeter of all penetrations, unless illustrated otherwise on the project details.
12. Block framing between studs where fibre-cement panel siding horizontal joints occur.
13. Place fasteners no closer than 9 mm (3/8") from panel edges and 51 mm (2") from panel corners.
14. Allow minimum 25 mm (1") vertical clearance between roofing and bottom edge of siding.
15. Maintain clearance between siding and adjacent finished grade.
16. Specific framing and fastener requirements to manufacturer's requirements.
17. 7/16" thick panels
    1. Install install as per manufacturer's "Reveal Panel System" Installation Instructions.
        1. Install "James Hardie Recess Vertical Trim" for vertical trim
        2. Install "James Hardie Recess Horizontal Trim: for horizontal profiles.
        3. Install "James Hardie Recess Horizontal Edge Trim" for use under windows, penetrations, and soffit
        4. Install "James Hardie Recess Outside Corner Edge Trim: for use at outside corners

3.4. Finishing

1. Refer to Section 09 90 00 – Painting and Staining.

3.5. Clean-up

1. As the Work proceeds and at the completion of fibre-cement cladding installation, promptly remove waste and excess material off site; repair and make good defects to this application or defects to other work caused by this application.

2. Clean equipment and dispose of wash water as well as all other cleaning and protective materials, in accordance with the safety requirements of authorities having jurisdiction.

END OF SECTION

1. GENERAL

1.1. Summary

1. Refer to architectural drawings in conjunction with the specification.

1.2. Section Includes

1. Provide all labour, materials, tools and other equipment, services and supervision necessary for the installation of all wood siding as indicated on the drawings and as specified herein.

1.3. References

1. American Society for Testing and Materials (ASTM)
    1. ASTM D 5116-90, Standard Guide For Small-Scale Environmental Chamber Determinations of Organic Emissions From Indoor Materials/Products.
2. Canadian General Standards Board (CGSB)
    1. CAN/CGSB-11.3-M87, Hardboard.
    2. CAN/CGSB-11.5-M87, Hardboard, Pre-coated, Factory Finished, for Exterior Cladding.
    3. CAN/CGSB-11.6-M87, Installation of Exterior Hardboard Cladding.
    4. CAN/CGSB-51.32-M77, Sheathing, Membrane, Breather Type.
3. Canadian Standards Association (CSA)
    1. CSA B111-1974, Wire Nails, Spikes and Staples.
    2. CSA O121-2008, Douglas Fir Plywood.
    3. CSA O151-2009, Canadian Softwood Plywood.
4. NLGA Standard Grading Rules for Canadian Lumber 2010.
5. FSC- Certified - Forest Stewardship Council Certification

1.4. Samples

1. Submit samples in accordance with Section 01 33 00 – Submittal Procedures.
2. Submit single 150mm (6”) wide profile, 610mm (24”) long with final finish applied. Waste Management and Disposal

1.5. Waste Management and Disposal

1. Divert wood cut-offs from landfill by disposal into on-site wood recycling bin or removed for disposal at nearest wood recycling facility.
2. Divert reusable materials for reuse at nearest used building materials facility.

2. PRODUCTS

2.1. Materials

1. Lumber siding: to NLGA Standard Grading Rules for Canadian Lumber.
    1. Vertical Shiplap, western red cedar, No. 2 and Better Clear grade, smooth face.

2. 19mm (3/4”) x 152.4mm (6”) width. 139.7mm (5-1/2”) exposure.

2. Soffit ventilation strip: 2” perforated black plastic ventilation strip

1. “Plastic soffit strip” by Menzies Metal; or pre-approved equivalent.

3. Coating: Refer to 09 90 00 Painting and Coatings.

4. Accessories: exposed trim, closures, cap pieces of manufacturer's standard, stain finish.

5. Exterior wall sheathing air barrier: Refer to 07 25 10 - Sheathing Membrane (Air Barrier).

6. Fasteners: nails to CSA B111 or staples, hot galvanized steel or stainless steel, sized as required

7. Sealants: Refer to 07 92 10 Joint Sealing.

3. EXECUTION

3.1. Installation

1. Install hardboard to CGSB11-GP-6M and manufacturers' instructions.

2. Install two layers sheathing paper horizontally by stapling, lapping edges 100 mm.

3. Install sill flashings, wood starter strips, inside corner flashings, edgings and flashings over openings.

4. Products shall have all butt and scarf joints caulked with a quality, exterior rated, flexible caulk prior to paint application. All Non-trim fascia abutments shall be caulked and sealed with the same exterior grade caulk

5. Ends exposed due to post-manufacturing field cuts shall be sealed with a premium, 100% acrylic primer to ensure that no finer is left exposed to the elements

6. Use only corrosion resistant fasteners. Acceptable are stainless steel or hot dipped galvanized nails; minimum size - 7 penny.

7. Fasten wood siding in straight, aligned lengths to as shown in architectural details

8. Fasten plywood siding so that all edges are supported. Maintain 1.5 mm wide gap between sheets. Nail at 300 mm o.c. along intermediate supports nd 150 mm along edges. Apply battens over vertical joints Caulk vertical joints.

9. For plywood clapboard siding: install starter strip. Place bottom of first course 3 mm below starter strip. Nail along bottom edge at each stud, penetrate siding and courses lap. Butt joints on studs and nail top and bottom each side. Adjacent siding pieces to touch lightly at butt joints. Leave 5 mm space between siding and window and door trim, caulk with sealant.

3.2. Protection

1. Protect installed products until completion of project

2. Touch-Up, Repair or replace damaged products before Substantial Completion.

3.3. Clean-up

1. As the Work proceeds and at the completion of fibre-cement cladding installation, promptly remove waste and excess material off site; repair and make good defects to this application or defects to other work caused by this application.

END OF SECTION

1. GENERAL

1.1. Summary

1. Refer to architectural drawings in conjunction with the specification.

1.2. Section Includes

1. Provide all labour, materials, tools, and other equipment, services and supervision required for installation of sheet metal roofing, underlayment, fasteners and accessories as indicated on drawings and specified herein.

1.3. Submittals

1. Submit proof of manufacturer's CCMC Listing and listing number to Consultant.
2. Submit proof of manufacturer's ISO registration and compliance to Consultant.
3. Submit proof of manufacturer's ISO 14001 registration and compliance to Consultant.
4. Submit proof of manufacturer's participation certificate for Environmental Choice Program to Consultant.
5. Manufacturer's Instructions: Provide to indicate special handling criteria, installation sequence, cleaning procedures and maintenance.

1.4. Product Data

1. Submit product data in accordance with Section 01 33 00 – Submittal Procedures.
2. Submit WHMIS MSDS - Material Safety Data Sheets in accordance with Section 01 35 30 – Health and Safety Requirements.
3. Submit product data sheets for bitumen, roofing felts, and insulation as applicable. Include:
    1. Product characteristics.
    2. Performance criteria.
    3. Limitations.

1.5. Shop Drawings

1. Submit shop drawings in accordance with Section 01 33 00 – Submittal Procedures.
2. Indicate arrangements of sheets and joints, types and locations of fasteners and special shapes and relationship of panels to structural frame.
3. Registered structural engineer in the Province of British Columbia to provide signed and sealed shop drawings and letters of Assurance.

1.6. Samples

1. Submit samples in accordance with Section 01 33 00 – Submittal Procedures.
2. Submit duplicate 300 x 300 mm (1'-0" x 1'-0") samples of each sheet metal material, showing seam installation.

1.7. Mock-ups

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

2. Fabricate 1 m x 1 m (3'-0" x 3'-0") sample roofing panel using identical project materials and methods to include typical seam.

1.8. Waste Management and Disposal

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

2. Place materials defined as hazardous or toxic waste in designated containers.

3. Ensure emptied containers are sealed and stored safely for disposal away from children.

4. Collect and separate plastic, paper packaging and corrugated cardboard in accordance with Waste Management Plan.

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

6. Collect and separate plastic and/or paper packaging for recycling.

7. Use the least toxic sealants, and adhesives necessary to comply with requirements of this section.

8. Close and seal, tightly, all partly used sealant and adhesive containers and store protected in well ventilated, fire-safe area at moderate temperature.

9. Place used hazardous sealant tubes and adhesive containers in areas designated for hazardous materials.

10. Collect, package and store sheet metal cut-offs and waste for recycling and return to recycler in accordance with Waste Management Plan.

1.9. Delivery, Storage and Handling

1. Deliver metal roofing to the job site as required for erection, but if site storage becomes necessary, provide covered suitable storage areas as close to the building site as is practical.

2. When outdoor storage is unavoidable:

    1. Use good quality covers, other than plastic, loosely shrouded over stacks and firmly anchored to prevent blow-off.

    2. Tilt and block bundles for drainage.

    3. Ventilate bundles but do not allow the entry of wind driven precipitation.

    4. Block bundles off the ground for effective ventilation and drainage.

    5. Block centre long bundles to prevent sagging.

    6. Store away from chemically aggressive substances (e.g. salt, cement, fertilizer), away from materials that could contaminate the surface (e.g. diesel oil, paint, grease) and away from site traffic.

3. Handle roofing panels with non-marring slings.

4. Do not bend metal panels.

1.10. Quality Assurance

1. Workmanship:

    1. Conform to the latest Guarantee Standards of the RCABC as published in the RCABC Roofing Practices Manual, for a five (5) year Guarantee, unless modified by the contract documents to exceed those minimums.

2. Perform work in accordance with CSSBI 20M-2017, or most recent version.

2. Independent inspection:

1. Perform using an independent inspection company acceptable to RCABC, Owner and Consultant, and assigned by RCABC.

2. Perform as required by RCABC under the five (5) year Guarantee Program.

3. Inspection costs for the Guarantee will be paid by Change Order, set against the Cash Allowance provided for this purpose. Refer to Section 01 21 00 – Allowances.

3. Guarantee:

1. Provide the standard RCABC fifteen (15) year Guarantee.

2. Provide the manufacturer's standard material guarantee for twenty-five (25) years.

2. PRODUCTS

2.1. Pre-finished Steel Sheet

1. VOC content for surface coatings and touch up coatings for pre-finished metal sheet maximum 250 g/L.

2. Surface coatings and touch up coatings manufactured or formulated without aromatic solvents, formaldehyde, halogenated solvents, mercury, lead, cadmium, hexavelant chromium and their compounds will be acceptable for use on this project.

3. Prefinished steel with factory applied polyvinylidene fluoride.

1. Acceptable products: "Prolok 12" Flat by Westform Metals Inc.; or pre-approved equivalent.

2. Acceptable products: Weathered Zinc PVDF repainted Steel color; refer to drawings

1. Alternate: Class F1S Colour selected by Consultant from manufacturer's standard range; refer to drawings.

3. Specular gloss: 30 units +/-5 in accordance with ASTM D 523.

4. Coating thickness: not less than 22 micrometres.

5. Resistance to accelerated weathering for chalk rating of 8, colour fade 5 units or less and erosion rate less than 20% to ASTM D 822 as follows:

1. Outdoor exposure period 2500 hours.

2. Humidity resistance exposure period 5000 hours.

2.2. Accessories

1. Isolation coating: alkali resistant bituminous paint.

2. Plastic cement: to CAN/CGSB-37.5.

1. Acceptable products: "Sopramastic" by Soprema Inc,; "#703 Plastic Roof Cement" by Malarkey Roofing Company; or pre-approved equivalent.

3. Underlay: No.15 perforated asphalt felt to CSA A123.3.

1. Acceptable products: “No. 15 Asphalt felt – perforated” by Iko Industries Ltd., HAL Industries Inc. or BPCO Inc.; or pre-approved equivalent.

4. Slip sheet: reinforced sisal paper or a heavy felt kraft paper.

5. Eave Protection: Self-adhesive glass fibre reinforcing mat coated on both sides with SBS modified asphalt. Acceptable products include “Armourguard Ice & Water Protector” by Iko Industries Ltd.; “Arctic Seal Ice & Water Guard” by Malarkey Roofing Company; or pre-approved equivalent.

6. Sealant: EcoLogo certified, not containing a total of volatile organic compounds in excess of 5% by weight, asbestos-free sealant, compatible with systems materials, recommended by system manufacturer.

7. Rubber-asphalt sealing compound: to CAN/CGSB-37.29.

    1. Acceptable products: “#709 Modified Flashing Cement” by Malarkey Roofing Company; or pre-approved equivalent.

8. Cleats: of same material, and temper as sheet metal, minimum 50 mm (2”) wide. Thickness same as sheet metal being secured.

9. Fasteners: concealed, per manufacturer’s recommendations.

10. Washers: of same material as sheet metal, 1 mm thick with rubber packings.

11. Z-bars/hat sections: galvanized to ASTM-A653; size and configuration to roof manufacturer’s recommendations.

12. Built-in gutters: two ply SBS system.

    1. Base sheet (SBS system): to CGSB 37-GP-56M, Styrene-Butadiene-Styrene (SBS) elastomeric polymer, prefabricated sheet, 3 mm (1/8”) thickness, glass reinforcement, weighing 180 g/m^2, Type 1, Class C, Grade 1.

        1. Top and bottom surfaces: polyethylene/sanded.

        2. Acceptable products: “Elastophene Flam” by Soprema Inc.; ”Torchflex TP-180-FF-Base” by Iko Industries Ltd.; or pre-approved equivalent.

    2. Cap sheet (SBS system): to CGSB 37-GP-56M, Styrene-Butadienne-Styrene (SBS) elastomeric polymer, prefabricated sheet, 4 mm (5/32”) thickness, glass reinforcement, weighing 250 g/m^2, Type 1, Class A, Grade 1.

        1. Bottom surface: sanded.

        2. Acceptable products: “Sopralene Flam 250” by Soprema Inc.; “Torchflex TP-250-Cap” by Iko Industries Ltd.; or pre-approved equivalent.

2.3. Fabrication

1. Fabricate sheet metal work other than aluminum in accordance with RCABC details and as indicated.

2. Fabricate aluminum sheet metal in accordance with Aluminum Association “Aluminum Sheet Metal Work in Building Construction”.

3. Form individual pieces in 2400 mm (8’-0”) maximum lengths. Make allowances for expansion at joints.

4. Hem exposed edges on underside 12 mm (1/2”), mitre and seal. Cut back and grind to around corner all mitred corners in locations where sharp edges could cause injury.

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

6. Apply minimum 0.2 mm (1/16") dry film thickness coat of plastic cement to both faces of dissimilar metals in contact.

7. Protect metals against oxidization by back painting with isolation coating where indicated.

3. EXECUTION

3.1. Installation

1. Use concealed fastenings except where approved by Consultant before installation.

2. Provide underlay under sheet metal roofing. Secure in place and lap joints 100 mm (4") minimum. Install eave protection in accordance with the BCBC 9.26.5.

3. Apply slip sheet over asphalt felt underlay to prevent bonding between sheet metal and felt. Secure with minimum anchorage and lap joints 50 mm (2") minimum in direction of water flow, except lap joints 100 mm (4") for roofs with a slope of 1:3 or more.

4. Install sheet metal roof panels using cleats spaced as recommended by installer.

5. Secure cleats with two fasteners each and cover with cleat tabs.

6. Align transverse seams in adjacent panels.

7. Flash roof penetrations with material matching roof panels, and make watertight.

8. Form seams in direction of water-flow and make watertight.

9. Separate sheet metal cut-offs and damaged material from non-recyclable waste and dispose of at proper recycling facility.

3.2. Standing Seam Roofing

1. Fold lower end of each pan under 20 mm (3/4"). Slit fold 25 mm (1") away from corner to form tab where pan turns up to make standing seam. Fold upper end of each pan over 50 mm (2"). Hook 20 mm (3/4") fold on lower end of upper pan into 50 mm (2") fold on upper end of underlying pan.

2. Apply sheet metal roofing beginning at eaves. Loose lock pans to valley flashing and edge strips at eaves and gable rakes.

3. Finish standing seams 25 mm (1") high on flat surfaces and 12 mm (1/2") high on curved surfaces. Bend up one side edge 40 mm (1-1/2") and other 45 mm (1-3/4"). Make first fold 6 mm (1/4") wide single fold and second fold 12 mm (1/2") wide, providing locked portion of standing seam with five (5) plies in thickness. Fold lower ends of seams at eaves over at 45° angle. Terminate standing seams at ridge and hips by turning down in tapered fold.

4. Form valleys of sheets not exceeding 3 m (10'-0") in length. Lap joints 150 mm (6") in direction of flow. Extend valley sheet minimum 15 mm (5/8") under roofing sheets. At valley line, double fold valley and roofing sheets and secure with cleats spaced 450 mm (1'-6") on centre.

3.3. Built-in Gutters

1. Form built-in box gutter lining with sheet metal conforming to profile of gutters.

2. Use 1000 mm (3'-4") long sheets if section profile of gutter exceeds 1000 mm (3'-4"). Use 2.4 m (8'-0") or 3 m (10'-0") long sheets if sectional profile is less than 1000 mm (3'-4").

3. Longitudinal joints not acceptable.

4. Secure gutter lining to substrate with screws, washers and expansion shields spaced maximum 1200 mm (4'-0") on centre along centre of lining.

5. At roof edges extend gutter lining under metal roofing 150 mm (6") minimum and terminate in 20 mm (3/4") folded edge secured by cleats. Hook lower end of roofing into lock strip to form 20 mm (3/4") wide loose-lock seam.

3.4. Finish

3.5. Clean-up

1. Clean all metal free of grease and dirt, and touch-up any scratched or chipped paint areas with matching colour as applicable.

END OF SECTION

1. GENERAL

1.1. Summary

1. Refer to architectural drawings in conjunction with the specification.

1.2. Section Includes

1. Provide all labour, materials, tools and other equipment, services and supervision, including all incidental and accessory items necessary for complete installation of metal flashings and trim in accordance with drawings and specified herein.

1.3. Samples

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

2. Submit duplicate 50 x 50 mm (2” x 2”) samples of each type of sheet metal material, colour and finish.

1.4. Product Delivery, Storage and Handling

1. Deliver sheet-metal flashing materials to site and store in safe, protected storage area to prevent damage.

2. Stack flashings to prevent twisting or bending out of shape.

3. Prevent contact of flashing materials with corrosive substances.

4. Replace damaged materials with new materials.

5. Handle and store metal flashings so that marring and scratching of coatings do not occur.

1.5. Guarantee

1. Guarantee flashing assembly free of the following defects: splitting seams, lifting, loosening and undue expansion for two (2) years from the date of Substantial Performance.

1.6. Waste Management and Disposal

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

2. Place materials defined as hazardous or toxic waste in designated containers.

3. Ensure emptied containers are sealed and stored safely for disposal away from children.

2. PRODUCTS

2.1.1. Pre-Finished Sheet Steel Components

1. Basis of Design: Westform Metals General Flashing, Light Zinc

2. Pre-finished steel with factory applied fluoropolymer (PVDF).

3. Class F1S

4. Colour to be selected by Consultant from Manufacturer’s standard range.

5. Specular Gloss: 30 units +/- 5 in accordance with ASTM-D523 “Standard Test Method for Specular Gloss”.

6. Coating Thickness: not less than 200 micrometers.

7. Resistance to accelerated weathering for chalk rating of 8, colour fade 5 units or less and erosion rate less than 20% to ASTM-D822 “Standard Practice for Conducting Tests on paint and Related Coatings and Materials Using Filtered Open Flame carbon-Arc Exposure Apparatus” as follows:

    1. Outdoor exposure period of 5000 hours.

    2. Humidity resistance exposure period of 2000 hours.

2.2. Accessories

1. Isolation coating: alkali resistant bituminous paint.

2. Plastic cement: to CAN/CGSB 37.5-M89.

3. Underlay for metal flashing: No. 15 perforated asphalt felt to CSA A123.3.

4. Sealants: to Section 07 92 10 – Joint Sealing.

5. Cleats: of same material, and temper as sheet metal; size to suit components to be secured; thickness sufficient to retain metal being secured.

6. Fasteners: of same material as sheet metal, to CSA B111, flat head roofing nails, spiral threads, length to minimum 25 mm (1”) penetration into substrate, and thickness suitable for metal flashing application.

7. Washers: of same material as sheet metal, 1 mm (1/16”) thick with rubber packings.

8. Solder: to ASTM B 32.

9. Flux: rosin, cut hydrochloric acid, or commercial preparation suitable for materials to be soldered.

10. Touch-up paint: as recommended by pre-finished material manufacturer.

11. Bituminous Paint: to CGSB 1-GP-108, type II, as required.

12. Insect Screen: Menzies Metals High back perforated J Channel, Aluminum

2.3. Metal Flashing Fabrication

1. Fabricate metal flashings and other sheet metal work in accordance with RCABC details and as indicated.

2. Fabricate aluminum flashings and other sheet aluminum work in accordance with Aluminum Association Aluminum Sheet Metal Work in Building Construction.

3. Form flashings, copings and fascias to profiles indicated of 24 gauge thick prefinished. Form pieces in 2400 mm (8’-0”) maximum lengths. Make allowance for expansion at joints.

4. Form sections square, true and accurate to size, free from distortion and other defects detrimental to appearance or performance. Form metal on a bending break. Shape, trim and hand-seam on bench as far as practicable with proper sheet-metal working tools. Form angle of bends and folds for interlocking of metal with full regard to expansion and contraction to avoid buckling or fullness in metal after it is in service and to avoid damaging surface of metal.

5. Hem exposed edges on underside 12 mm (1/2”).

3. EXECUTION

3.1. Installation of Metal Flashings

1. Install sheet metal work in accordance with RCABC details, Aluminum Sheet Metal Work in Building Construction and as indicated.

2. Use concealed fastenings except where approved before installation. Securely anchor metal flashings to continuous blocking or nailers using clips and fasteners suitable for each application. All anchoring to RCABC guarantee requirements.

3. Provide underlay under sheet metal. Secure in place and lap joints 100 mm (4”).

4. Use maximum sheet metal lengths for flashing to avoid unnecessary seams. Using cut-offs to make extended lengths is not permitted, and **will be rejected by Consultant.**

5. Use standing seam joints where practical and S-lock joints where standing seams are impractical where adjacent lengths of metal flashing meet. Execute by inserting end of one coping length into a full bed of caulking compound in a 25 mm (1”) deep S-joint formed in end of adjacent length. Extend concealed portion of S-joint 25 mm (1”) outwards, nailed to substrate. Face nailing of joints not permitted.

6. Install continuous starter strips where indicated or required to present a true, non-waving leading edge. Anchor to backup to provide rigid, secure installation.

7. Use folded joints where corner joints meet adjacent lengths of material. Apply continuous bead of sealant as an additional protection. Cut back and grind to around corner all mitred corners in locations where sharp edges could cause injury.

8. Apply isolation coating to metal surfaces to be embedded in concrete or mortar; apply minimum 0.2 mm (1/16”) dry film thickness coat of plastic cement to both faces of dissimilar metals in contact. Back prime all metal flashings with a cut back asphalt primer.

9. Ensure that wide girth cap flashings are adequately sloped to inside roof area and do not pond water.

10. Maintain 1:8 minimum slope on exposed horizontal surfaces of all flashings. Flashings without adequate cross-slope, or with a back slope **will be rejected by Consultant.**

11. Install metal flashings clear of wall surfaces to prevent localised wall surface staining. In particular, ensure separation at seam locations.

12. Site fabricate 12.7 mm (1/2”) high folded dams to ends of all flashing terminations, particularly at window and door head flashing locations.

3.2. Counter Flashings, Cap Flashings and Reglets

1. Install counter flashings as soon as possible after membrane flashings are in place.

2. Fold a bottom edge stiffening break where indicated, and extend counter flashing up vertical face of wall or curb to height shown, then turn into reglets or interlock with cap flashing.

3. Cap flash tops of walls, parapets, counter flashings and the like as detailed, after membrane and metal counter flashings are in place.

4. Turn top edge of flashing into recessed reglet or mortar joint minimum of 25 mm (1”). Lead wedge flashing securely into joint.

5. Caulk flashing at reglet or cap flashing with sealant and bond breaker.

3.3. Pans and Saddles Installation

1. Install pans, where shown around items projecting through roof membrane.

2. Install sheet metal saddles where roof parapets or walls terminate at vertical wall surface. Solder joints and shop paint sheet metal saddles to match adjacent pre-finished flashings.

3.4. Eaves Troughs and Rain Water Leaders

1. Install eaves troughs and secure to building at 750 mm (2'-6") on centre with eaves trough spikes through spacer ferrules. Slope eaves troughs to rain water leaders as indicated. Seal joints watertight.

2. Install rain water leaders and provide goosenecks back to wall. Secure downpipes to wall with straps at 1800 mm (6'-0") maximum, or as indicated on drawings; minimum two straps per rain water leader. Connect rain water leaders to drainage system and seal joint with plastic cement.

3. Install splash pads where rain water leaders end on lower roof areas.

3.5. Scuppers

1. Install scuppers as indicated.

3.6. Clean-up

1. Clean all flashings free of grease and dirt, and touch-up any scratched or chipped paint areas with matching colour.

END OF SECTION

1. GENERAL

1.1. Summary

1. Refer to architectural drawings in conjunction with the specification.

1.2. Section Includes

1. Provide all labour, materials, tools and other equipment, services and supervision necessary for the installation of all necessary firestopping as indicated on the drawings, as specified herein, and as required by the British Columbia Building Code, current edition.

1.3. Related Work

1. Fire stopping and smoke seals within mechanical assemblies (i.e. inside ducts, dampers) and electrical assemblies (i.e. inside cable trays) are specified in mechanical and electrical divisions respectively.

1.4. Design Performance Standards

1. Firestopping must conform to CAN/ULC S101-04 “Standard Method of Fire Endurance Tests of Building Construction and Materials” and ULC S115-11 “Standard Method of Fire Tests for Firestopping”. Complete fire tested compatibility and operational compatibility without stress corrosion and/or any weakening effects within the following materials and/or combinations thereof in their respective applications:
    1. Black Steel – piping, sleeving and structural.
    2. Copper – piping.
    3. Aluminum – cable tray.
    4. Galvanized Steel.
    5. Cast Iron – piping.
    6. ASJ Vapour Barriers – insulation, jacketing.
    7. Concrete.
    8. Masonry.
    9. Power Cables – minimum 40% tray fill area rating.
    10. Communication Cables – minimum 40% tray fill area rating.
2. Inspection of installations must be simplified by using identifiable material colours such as orange or yellow.
3. Pressure: 25 mm (1”) head (0.0025 kg/m^2) of water pressure resistance required for all fire stop seals.
4. Non-slump ability in wall and overhead applications.
5. Re-enreability in cable and cable tray penetrations without the use of power tools.
6. Minimum 17.6 kg/cm^2 (250 psi) compression strength in cable and cable tray penetration.

1.5. Samples

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

2. Submit duplicate 300 x 300 mm (1'-0" x 1'-0") samples showing actual firestop material proposed for project.

1.6. Shop Drawings

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

2. Submit complete shop drawings (using architectural floor plans) showing location of all firestop seals including mechanical and electrical seals. Indicate applicable listed ULC system and design number as applicable. Show fire rated walls and floor penetrations. Show all penetrations and develop an indexing (identification) system.

3. Submit a schedule of firestopping applications, listings, indicating products and application methods proposed for use, indicating ULC designs on which choices of products and application are based. Show any variations, limitations where listings are expected to be exceeded.

4. Show proposed material, reinforcement, anchorage, fastenings and method of installation. Construction details should accurately reflect actual job conditions.

5. Shop drawings to be submitted and reviewed prior to forming of concrete openings and placement of sleeves for mechanical and electrical penetrations.

6. For building assemblies that do not correspond to any previously tested and rated assemblies, submit proposals based on related designs using accepted fireproofing design criteria.

1.7. Product Data

1. Submit product data in accordance with Section 01 33 00 – Submittal Procedures.

2. Submit manufacturer's product data for materials and prefabricated devices, providing descriptions are sufficient for identification at job site. Include manufacturer's printed instructions for installation.

1.8. Quality Assurance

1. Submit workers qualification cards in accordance with Section 01 33 00 – Submittal Procedures.

2. All installers must have Level One qualification cards and must submit proof of the same prior to work commencing on site.

3. All work is to be of the highest quality according to best trade practice and in strict accordance with manufacturer's printed trade specifications, by an approved specialist firestopping caulking firm employing only skilled tradesmen.

4. Submit upon completion, in accordance with Section 01 33 00 – Submittal Procedures, signed copies of letters of assurance confirming conformity to reviewed shop drawings and complete firestopping and smoke seal systems including mechanical and electrical.

1.9. Waste Management and Disposal

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

2. Collect and separate plastic, paper packaging and corrugated cardboard in accordance with Waste Management Plan.

2. PRODUCTS

2.1. Materials

1. Fire stopping and smoke seal systems: in accordance with ULC S115-11.

1. Asbestos-free materials and systems capable of maintaining an effective barrier against flame, smoke and gases in compliance with requirements of ULC S115-11 and not to exceed opening sizes for which they are intended and conforming to special requirements specified in 3.6.

2. Firestop system rating: F OR FT OR FTH as required by the BCBC.

3. Firestop Caulking Compound: minimum requirements, National Standards System specifications as applicable.

4. Approved Firestop Caulking (Sealants) Compound: Only those products tested, approved and listed in the ULC – List of Equipment and Materials, Volume II – Building Construction, may be used and only within specific firestop joint locations as listed.

2. Service penetration assemblies: certified by ULC in accordance with ULC S115-11 and listed in ULC Guide No.40 U19.

3. Service penetration firestop components: certified by ULC in accordance with ULC S115-11 and listed in ULC Guide No.40 U19.13 and ULC Guide No.40 U19.15 under the Label Service of ULC.

4. Fire-resistance rating of installed fire stopping assembly in accordance with NBC.

5. Fire stopping and smoke seals at openings intended for ease of re-entry such as cables: elastomeric seal.

6. Fire stopping and smoke seals at openings around penetrations for pipes, ductwork and other mechanical items requiring sound and vibration control: elastomeric seal, minimum 10% operational movement of all joints.

7. Primers: to manufacturer’s recommendation for specific material, substrate, and end use.

8. Water (if applicable): potable, clean and free from injurious amounts of deleterious substances.

9. Damming and backup materials, supports and anchoring devices: to manufacturer's recommendations, and in accordance with tested assembly being installed as acceptable to authorities having jurisdiction.

10. Sealants for vertical joints: non-sagging.

3. EXECUTION

3.1. Preparation

1. Examine sizes and conditions of voids to be filled to establish correct thicknesses and installation of materials. Ensure that substrates and surfaces are clean, dry and frost free.

2. Prepare surfaces in contact with fire stopping materials and smoke seals to manufacturer’s instructions.

3. Maintain insulation around pipes and ducts penetrating fire separation without interruption to vapour barrier.

4. Mask where necessary to avoid spillage and over coating onto adjoining surfaces; remove stains on adjacent surfaces.

3.2. Sequencing

1. No installation is to proceed unless review and return of shop drawings has been completed.

2. Firestopping to floor and roof slab penetrations must precede gypsum board track installation.

3. Firestopping must precede fireproofing installation.

4. Firestopping at slab edge detail to exterior wall panels and at window panels must be done with wall panel installations.

5. Firestopping must precede mechanical pipe insulation (vapour barriers must be continued along with FPI-SAJ jacketing).

3.3. Installation

1. Install fire stopping and smoke seal material and components in accordance with ULC certification and manufacturer's instructions.

2. Seal holes or voids made by through penetrations, poke-through termination devices, and unpenetrated openings or joints to ensure continuity and integrity of fire separation are maintained.

3. Provide temporary forming as required and remove forming only after materials have gained sufficient strength and after initial curing.

4. Tool or trowel exposed surfaces to a neat finish.

5. Remove excess compound promptly as work progresses and upon completion.

6. Each installation on site shall be labelled with the corresponding listing number for that particular installation.

3.4. Inspection

1. Notify Consultant when ready for inspection and prior to concealing or enclosing firestopping materials and service penetration assemblies.

3.5. Schedule

1. Firestop and smoke seal at:

    1. Penetrations through fire-resistance rated masonry, concrete, and gypsum board partitions and walls.

    2. Edge of floor slabs at curtain wall and precast concrete panels.

    3. Top of fire-resistance rated masonry and gypsum board partitions.

    4. Intersection of fire-resistance rated masonry and gypsum board partitions.

    5. Control and sway joints in fire-resistance rated masonry and gypsum board partitions and walls.

    6. Penetrations through fire-resistance rated floor slabs, ceilings and roofs.

    7. Openings and sleeves installed for future use through fire separations.

    8. Around mechanical and electrical assemblies penetrating fire separations.

    9. Rigid ducts greater than 129 cm^2: fire stopping to consist of bead of fire stopping material between retaining angle and fire separation and between retaining angle and duct, on each side of fire separation.

3.6. Special Requirements

1. Location of special requirements for fire stopping and smoke seal materials at openings and penetrations in fire resistant rated assemblies are as follows:

1. Movement: where firestopping is installed between elements which move with respect to each other, use firestopping materials which are resilient. Examples of such situations are non-loadbearing walls beneath roof structure and pipes that change temperature from time to time.

3.7. Patching

1. Cut, patch and repair any material that fails to meet the requirements of this specification or that fails to attain the properties stipulated in the reports or tests used to determine fire resistance ratings.

2. Patch damage to firestopping caused by testing or by other trades before it is concealed, or if exposed, before final review.

3.8. Clean-up

1. Remove excess materials and debris and clean adjacent surfaces immediately after application.

2. Remove temporary dams after initial set of fire stopping and smoke seal materials.

END OF SECTION

1. GENERAL

1.1. Summary

1. Refer to architectural drawings in conjunction with the specification.

1.2. Section Includes

1. Provide all labour, materials, tools and other equipment, services and supervision necessary for the complete installation of all joint sealants where indicated on the drawings and in the specifications.

1.3. Samples

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

2. Submit duplicate samples of each type of material and colour.

1.4. Mock-up

1. Construct mock-ups in accordance with Section 01 45 00 – Quality Control.

2. Construct mock-up to show location, size, shape and depth of joints complete with back-up material, primer, caulking and sealant. Mock-up may be part of finished work.

3. Allow twenty-four (24) hours for review of mock-up by Consultant before proceeding with sealant work.

1.5. Delivery, Storage and Handling

1. Deliver and store materials in original wrappings and containers with manufacturer's seals and labels, intact. Protect from freezing, moisture, water, direct sunlight and contact with ground or floor.

1.6. Guarantee

1. Provide a written guarantee, signed and issued in the name of the Owner, stating that that sealant and caulking work is guaranteed against leakage, cracking, crumbling, melting, shrinkage, running, loss of adhesion, staining adjacent surfaces, or other failure for a period of three (3) years from the date of Substantial Performance.

1.7. Environmental and Safety Requirements

1. Comply with requirements of Workplace Hazardous Materials Information System (WHMIS) regarding use, handling, storage, and disposal of hazardous materials; and regarding labelling and provision of material safety data sheets acceptable to Human Resources Development Canada.

2. Conform to manufacturer's recommended temperatures, relative humidity, and substrate moisture content for application and curing of sealants including special conditions governing use. Use appropriate measures for protection and supplementary heating to ensure proper curing in accordance with manufacturer's recommendations if application during inclement weather occurs; ensure substrate is dry.

3. Protect adjacent work from contamination due to mixing, handling, and application of flexible epoxy joint filler.

1.8. Waste Management and Disposal

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

2. Place materials defined as hazardous or toxic waste in designated containers.

3. Ensure emptied containers are sealed and stored safely for disposal away from children.

4. Dispose of surplus chemical and finishing materials in accordance with federal, provincial and municipal regulations.

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

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

7. Use trigger operated spray nozzles for water hoses.

8. Return solvent and oil soaked rags for contaminant recovery and laundering or for proper disposal.

9. Use the least toxic sealants, adhesives, sealers, and finishes necessary to comply with the requirements of this section.

10. Close and seal tightly all partly used sealant containers and store protected in well-ventilated fire-safe area at moderate temperature.

11. Place used hazardous sealant tubes and other containers in areas designated for hazardous materials.

2. PRODUCTS

2.1. Sealant Materials

1. Sealants and caulking compounds must:

    1. Meet or exceed all applicable governmental and industrial safety and performance standards; and,

    2. Be manufactured and transported in such a manner that all steps of the process, including the disposal of waste products arising there from, will meet the requirements of all applicable governmental acts, by laws and regulations including, for facilities located in Canada, the fisheries Act and the Canadian Environmental Protection Act (CEPA).

2. Sealant and caulking compounds must not be formulated or manufactured with: aromatic solvents, fibrous talc or asbestos, formaldehyde, halogenated solvents, mercury, lead, cadmium, hexavalent chromium, barium or their compounds, except barium sulfate.

3. Sealant and caulking compounds must not contain a total of volatile organic compounds (VOCs) in excess of 5% by weight as calculated from records of the amounts of constituents used to make the product;

4. Sealant and caulking compounds must be accompanied by detailed instructions for proper application so as to minimize health concerns and maximize performance, and information describing proper disposal methods.

5. Caulking that emits strong odours, contains toxic chemicals or is not certified as mould resistant shall not be used in air handling units.

6. When low toxicity caulks are not possible, confine usage to areas which off gas to the exterior, are contained behind air barriers, or are applied several months before occupancy to maximize off-gas time.

7. In the selection of the products and materials of this section preference will be given to those with the following characteristics: water based, water soluble, water clean-up, non-flammable, biodegradable, low Volatile Organic Compound (VOC) content, manufactured without compounds which contribute to ozone depletion in the upper atmosphere, manufactured without compounds which contribute to smog in the lower atmosphere, does not contain methylene chloride, and does not contain chlorinated hydrocarbons.

8. The manufacturing process must adhere to Lifecycle Assessment Standards as per ISO 14040/14041 LCA Standards, CSA Z760-94 LCA Standards.

9. Sealants acceptable for use on this project except CAN/CGSB-19.1 and CAN/CGSB-19.18 must be listed on CGSB Qualified Products List issued by CGSB Qualification Board for Joint Sealants. Where sealants are qualified with primers use only these primers.

10. Select proper sealants for particular joints in accordance with current recommendations as published by the manufacturer. Ensure that back-up materials are compatible with selected sealant and of type recommended by manufacturer. Select sealant and caulking in exterior locations capable of being painted or stained.

    1. Basis of Design for Acoustical Sealant: USG Sheetrock Sealant

    2. Basis of Design for sill Seal Gasket: Menzies Metals Sill Seal gasket.

2.2. Sealant Material Designation

1. Polysulfide Two Part:

    1. Self-Levelling to CAN/CGSB-19.24, Type 1, Class B, with plus or minus 25% joint movement capability.

2. Polysulfide Two Part:

    1. Non-Sag to CAN/CGSB-19.24, Type 2, Class B, with plus or minus 25% joint movement capability,.

3. Polysulfide One Part:

    1. Self-Levelling to CAN/CGSB-19.13, with plus or minus 25% joint movement capability,.

4. Polysulfide One Part:

    1. Non-Sag to CAN/CGSB-19.13, with plus or minus 25% joint movement capability.

5. Polyurethanes Two Part:

    1. Self-Levelling to CAN/CGSB-19.24, Classification MCG-1-40-B-L, with plus or minus 25% movement capability for horizontal joints.

    2. Acceptable material: “MasterSeal SL 2” by BASF, or equivalent.

6. Polyurethanes Two Part:

    1. Non-Sag to CAN/CGSB-19.24, Classification MCG-2-40-A-N, with plus or minus 25% movement capability for vertical joints.

    2. Acceptable material: “MasterSeal NP 2” by BASF, or equivalent., or equivalent.

7. Polyurethanes One Part:

    1. Self-Levelling to CAN/CGSB-19.13, Classifications C-1-40-B-N and C-1-25-B-N, with plus or minus 25% movement capability for horizontal joints.

    2. Acceptable material: “MasterSeal SL 1” by BASF, or equivalent.

8. Polyurethanes One Part:

    1. Non-Sag to CAN/CGSB-19.13, Classification MCG-2-25-A-N, with plus or minus 25% movement capability for vertical joints.

    2. Acceptable material: “MasterSeal NP 1” by BASF, or equivalent.

9. Silicones One Part:
    1. To CAN/CGSB-19.13.
    2. To CAN/CGSB-19.22 (Mildew resistant).
        1. Acceptable material: Tremco “Proglaze”, or equivalent.
10. Acrylics One Part:
    1. To CGSB 19-GP-5M.
11. Acrylic Latex One Part:
    1. To CAN/CGSB-19.17.
    2. Acceptable material: “MasterSeal NP 520” by BASF, or equivalent.
12. Acoustical Sealant:
    1. To CAN/CGSB-19.21.
    2. Acceptable material: USG acoustical sealant (non-setting), or equivalent.
13. Butyl:
    1. To CGSB 19-GP-14M.
14. Oil-Based:
    1. To CAN/CGSB-19.6.
15. Modified Oil-Based:
    1. To CAN/CGSB-19.2.
16. Poured Flexible Epoxy Joint Filler:
    1. Properties:
        1. Shore A Hardness: 85 ± 5.
        2. Shore D Hardness: 34.
        3. Elongation: 75%.
        4. Tensile Strength: 4.5 MPa (655 lbs/in2) ± 0.07 MPa (10 lbs/in2).
        5. Mixing Ratio: 1 to 1 by volume.
        6. Pot Life: 40 to 55 minutes at 24°C (75°F).
        7. Cure Time, Foot Traffic: 4 hours.
        8. Cure Time, Vehicular Traffic: 24 hours.
        9. Application Temperature: Minimum 13°C (55°F).
    2. Acceptable material: “MasterSeal CR190” by BASF, two part 100% solids epoxy joint filler with flexible, pourable, self-levelling properties.
17. Preformed Compressible and Non-Compressible back-up materials:
    1. Polyethylene, Urethane, Neoprene or Vinyl Foam:

1. Extruded closed cell foam backer rod.

2. Size: oversize 30–50%.

2. Neoprene or Butyl Rubber:

1. Round solid rod, Shore A hardness 70.

3. High Density Foam:

1. Extruded closed cell polyvinyl chloride (PVC), extruded polyethylene, closed cell, Shore A hardness 20, tensile strength 140 to 200 kPa, extruded polyolefin foam, 32 kg/m3 density, or neoprene foam backer, size as recommended by manufacturer.

4. Bond Breaker Tape:

1. Polyethylene bond breaker tape that will not bond to sealant.

2.3. Sealant Selection Schedule

1. The following is a list of materials and locations and is intended as a guide only, and may not include all sealants and/or locations appropriate to this project, or may include sealants and/or locations not applicable to this project.

2. General Purpose Interior and Exterior Applications:

1. Sealant: one or two part polyurethane, polysulfide, or silicone.

2. Applications:

1. Joints and recesses between adjacent constructions and frames, sills, and subsills of windows, doors, curtainwall, storefront, and louvers.

2. Coping joints and wash joints in precast concrete, cast stone, or natural stone.

3. Masonry joints beneath shelf angles.

4. Around penetrations in exterior walls.

5. Under door thresholds and at bottom of door frames.

6. Where necessary to prevent infiltration of water or air into or through exterior building envelope.

3. Other Exterior Applications:

1. Sealant: one or two part polyurethane, or silicone.

2. Applications:

1. Between adjacent construction and gravel stops, copings, fascias, and miscellaneous flashings.

2. Metal flashings inserted into reglet.

3. Top edges of surface mounted counter flashing.

4. Expansion and control joints in masonry where expansion joint covers are not indicated.

5. Joints between new and existing exterior construction.

4. Interior Wetted Areas:
    1. Sealant: silicone.
    2. Applications: between adjacent construction and vanities, shower stalls, bathtub and shower enclosures, sinks, counter tops, plumbing cut-outs, and plumbing fixtures.
5. Interior High-Movement Joints:
    1. Sealant: one or two part polyurethane, polysulfide, or silicone.
    2. Applications: at resilient joint between interior partitions and floor framing above.
6. Other Interior Applications:
    1. Sealant: one or two part polyurethane, polysulfide, or silicone.
    2. Applications:
        1. Between adjacent construction and equipment, shelving, casework, and furniture.
        2. Perimeters of door and window frames, access panels.
        3. Between interior partitions and adjoining concrete or steel columns, walls, or other construction.
        4. Other exposed locations within partitions to seal against passage of air.
        5. Other interior joints of small dimension that require painting.
        6. Gypsum board partitions:
        7. Between gypsum panels and metal track at floors and dissimilar walls; install sealant just prior to installation of gypsum panel.
        8. Between adjacent face layers of abutting intersection gypsum board partitions; install sealant before taping and finishing joint.
        9. Between gypsum panels and penetrations: Seal around openings of ducts and pipes. Seal sides and backs of electrical boxes.
        10. Seal control joints prior to installing control joint trim.
        11. Other concealed locations within partitions to completely seal against passage of air.
        12. Seal (silicone) between cabinetry and resilient flooring (or hard surface flooring), and cabinetry and walls.
        13. Seal (silicone) between bottom of doorframes and resilient flooring or hard surface flooring.
    3. Allow sealant to cure before painting over joint.
7. Exterior Traffic Surfaces:
    1. Sealant: one and two part self-levelling polyurethane.
    2. Applications: control and expansion joints in sidewalks and pavements.
8. Interior Traffic Surfaces:
    1. Sealant: one and two part self-levelling polyurethane.

2. Applications: control and expansion joints in floors.

9. Interior Heavy Traffic Surfaces:

    1. Surface Preparation: freshly saw-cut or blast-clean joints; blow with oil-free compressed air.

    2. Sealant: epoxy joint filler; pour flush with adjacent surfaces in two pours in accordance with manufacturer's instructions.

    3. Applications: control joints in floors subject to vehicular traffic.

10. Interior Acoustical Mitigation Areas:

    1. Sealant: acoustical sealant.

    2. Applications:

        1. Stud plates top and bottom.

        2. Junction of vertical studs with dissimilar materials

        3. Around penetrations in walls.

        4. Lap and end joints in vapour barriers.

        5. As required by rated assembly specifications.

11. Glazing:

    1. Primer: none.

        1. Glass (non-coated).

        2. Ceramic tile, quarry tile.

    2. Primer:

        1. Aluminum (anodized and mill finish).

        2. Iron and steel (carbon, stainless, galvanized).

        3. Wood.

        4. Marble, slate.

        5. Concrete.

    3. Sealant: silicone.

    4. Applications:

        1. Glazing including butt and lap sheer joints, stopless glazing, and cap, head and toe bead in conventional glazing.

        2. Curtain wall.

        3. Storefront.

        4. Glass partitions.

        5. Glass blocks.

        6. Solar panels.

7. Skylights.

2.4. Joint Cleaner

1. Non-corrosive and non-staining type, compatible with joint forming materials and sealant recommended by sealant manufacturer.

2. Primer: low VOC, as recommended by manufacturer.

2.5. Colour

1. Sealant Colours: selected by the architect from the manufacturer's standard range.

3. EXECUTION

3.1. Protection

1. Protect installed work of other trades from staining or contamination.

3.2. Preparation of Joint Surfaces

Joint Width	Sealant Depth
6 mm (1/4")	6 mm (1/4")
19 mm (3/4")	9 mm (3/8")
32 mm (1-1/4")	13 mm maximum (1/2")

Note: minimum adhesion: 1.5 times depth.

1. Examine joint sizes and conditions to establish correct depth to width relationship for installation of backup materials and sealants. Maintain depth of sealant at middle of joint width as follows:

2. Clean bonding joint surfaces of harmful matter substances including dust, rust, oil grease, and other matter which may impair work.

3. Do not apply sealants to joint surfaces treated with sealer, curing compound, water repellent, or other coatings unless tests have been performed to ensure compatibility of materials. Remove coatings as required.

4. Ensure joint surfaces are dry and frost free.

5. Prepare surfaces in accordance with manufacturer's directions.

6. Cure concrete surfaces for four (4) weeks, then clean with a wire brush, grind or sandblast as necessary. Thoroughly remove dust and debris.

3.3. Priming

1. Where necessary to prevent staining, mask adjacent surfaces prior to priming and sealing; do not remove making tape before joints have been tooled and initial cure of joint filler has taken place; work stained due to failure of proper masking precautions will not be accepted.

2. Prime sides of joints in accordance with sealant manufacturer's instructions immediately prior to caulking.

3.4. Backup Material

1. Install bond-breaker strip in joint to be sealed on top of back-up material to prevent adhesion of sealant to back-up material; install as per manufacturer's recommendations.

2. Install joint filler to achieve correct joint depth and shape, with approximately 30% compression.

3.5. Mixing

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

3.6. Sealant

1. Apply sealant in accordance with manufacturer's written instructions within temperature restrictions; carry out application by thoroughly trained mechanics fully competent in the application of joint sealers.

2. Mask edges of joint where irregular surfaces or sensitive joint borders exist to provide neat joint.

3. Apply sealant in continuous beads.

4. Apply sealant using gun with proper size nozzle.

5. Use sufficient pressure to fill voids and joints solid.

6. Form surface of sealant with full bead, smooth, free from ridges, wrinkles, sags, air pockets, embedded impurities.

7. Tool exposed surfaces before skinning begins to give slightly concave shape; superficial pointing with skin bead is not acceptable.

8. Remove excess compound promptly as work progresses and upon completion.

3.7. Epoxy Joint Filler

1. Transfer entire contents of activator container thoroughly with entire contents of base container in separate container of appropriate size.

2. Mix only as much material as can be applied within manufacturer's recommended application time period.

3. Mix with slow-speed drill (80-100 rpm) and slotted paddle. Ensure mixing paddle reaches bottom and scrapes side of container several times. Scrape paddle several times to ensure thorough mixing. Keep paddle blade below surface to avoid whipping air into material.

4. Mix epoxy joint filler for 5 to 7 minutes.

5. Pour epoxy joint filler from spouted can or professional bulk-loading caulking gun.

6. Maintain minimum joint application of 2/3 joint depth or 25 mm (1”), whichever is greater.

7. Fill joints from bottom up to exterior face by holding properly sized nozzle against joint bottom.

8. Tool joint to ensure maximum adhesion to joint sides, correct bead configuration, and a neat joint. Dry tool or dampen tool with joint cleaner. Do not use water or soapy water.

9. Apply materials only within manufacturer’s specified application life period. Discard joint filler after application life is expired or if prescribed application period has elapsed.

3.8. Curing

1. Cure sealants in accordance with sealant manufacturer's instructions.

2. Do not cover up sealants until proper curing has taken place.

3.9. Clean-up

1. Clean adjacent surfaces immediately and leave work neat and clean.

2. Remove uncured sealant and joint filler with joint cleaner; remove cured sealant and joint filler by razor, scraping, or mechanically.

3. Remove masking tape after initial set of sealant.

4. Remove all debris related to application of sealants from job site in accordance with all applicable regulations for hazardous waste disposal.

END OF SECTION

1. GENERAL

1.1. Summary

1. Refer to architectural drawings in conjunction with the specification.

1.2. Section Includes

1. Provide all labour, materials, tools and other equipment, services and supervision for the complete fabrication, supply, finishing and installation of all steel doors and frames and as indicated on the drawings and as specified herein.

2. The supply and installation of all fire-rated welded pressed metal door frames to locations as shown on the drawings.

3. The supply and installation of all flush and glazed fire-rated hollow metal doors to pressed metal frames, as scheduled.

4. The supply and installation of wired glass and tempered glass to all pressed metal window frames and hollow metal doors, including the installation of glazing stops.

5. The supply and installation of all necessary anchors, clips, head and sill flashings.

6. The installation of all finish hardware, including thresholds, sweeps, clos ers, weatherstripping, and locksets.

1.3. Related Sections

1. 06 10 10 - Rough Carpentry

2. 07 92 10 - Joint Sealing

3. 08 71 10 - Door Hardware: General

4. 08 80 50 - Glazing

5. 09 90 00 - Painting and Coatings

1.4. Design Requirements

1. Design exterior frame assembly to accommodate to expansion and contraction when subjected to minimum and maximum surface temperature of minus 35°C to 45°C.

1.5. Shop Drawings

1. Submit shop drawings in accordance with Section 01 33 00 – Submittal Procedures, prior to manufacture.

2. Indicate each type of door, material, steel core thicknesses, mortises, reinforcements, location of exposed fasteners, openings, glazed and/or louvred, arrangement of hardware, fire rating and finishes.

3. Indicate each type frame material, core thickness, reinforcements, glazing stops, location of anchors, exposed fastenings, reinforcing, fire rating, finishes, and frame head, jamb, mullion and sill sections.

4. Indicate handing of all openings, and quantities of glazed walls and doors to be provided.

5. Include schedule identifying each unit, with door marks and numbers relating to numbering on drawings and door schedule.

1.6. Requirements of Regulatory Agencies

1. Steel fire rated doors and frames: labelled and listed by an organization accredited by Standards Council of Canada in conformance with CAN4-S104M (NFPA 252) for ratings specified or indicated.

2. Provide fire labelled frame products for those openings requiring fire protection ratings, as scheduled. Test products in strict conformance with CAN4-S104, ASTM E 152 or NFPA 252 and list by nationally recognized agency having factory inspection service and construct as detailed in Follow-Up Service Procedures/Factory Inspection Manuals issued by listing agency to individual manufacturers.

1.7. Quality Assurance

1. Metal doors and frames shall conform to the Canadian Steel Door and Frame Manufacturer's Association (CSDFMA) Manufacturing Specifications for Steel Doors and Frames.

2. Metal (steel) windows to conform to CAN/CSA-A440-98, specifically:

    1. Air Tightness, fixed sections: maximum air leakage of 0.25 m^3/hr/m of frame perimeter, A3 minimum.

    2. Water Tightness, fixed lites: B5; able to resist a pressure differential of 500 Pa for 15 minutes.

    3. Wind Load Resistance, fixed lites: C3 window rating.

3. Provide a written guarantee covering all doors and frames supplied under this section against deformation or other defects for a period of one year after delivery to the site. Replace at no extra charge and refinish to match, any defective doors and frames appearing within the guarantee period.

1.8. Product Delivery, Storage and Handling

1. Deliver all doors and frames to the job site, factory sealed and wrapped as necessary to prevent deterioration and damage. Frames to be welded and labelled as required, and doors to be pre-fitted for hardware. Store in accordance with the manufacturer's recommendations.

1.9. Waste Management and Disposal

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

2. Place materials defined as hazardous or toxic waste in designated containers.

3. Ensure emptied containers are sealed and stored safely for disposal away from children.

4. Set aside and protect surplus and uncontaminated waste finish materials. Deliver to, or arrange collection by employees, individuals, or organizations for verifiable re-use or re-manufacturing.

5. Place materials defined as hazardous or toxic waste in designated containers, and place used sealant and adhesive tubes and containers in areas designated for hazardous waste.

6. Return solvent and oil soaked rags, used during installation, for contaminant recovery, proper disposal, or appropriate cleaning with no contaminant release to water systems.

7. Close and seal tightly all partly used sealant and adhesive containers and store protect in well-ventilated, fire-safe area at moderate temperature.

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

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

10. Collect wood packing shims and pallets and place in designated area for recycling and reuse.

11. Do not dispose of paints or solvents by pouring on the ground. Place in designated containers and ensure proper disposal in accordance with federal, provincial and municipal regulations.

12. Solvent based paints, which cannot be reused must be treated as hazardous waste and disposed of in an appropriate manner in accordance with hazardous waste regulations. Empty paint cans are to be dry prior to disposal or recycling (where available).

13. Where paint recycling is available collect all waste paint by type and provide for delivery to recycling or collection facility.

14. Paints and finishes are regarded as hazardous products and are subject to regulations for their disposal. Information on these controls can be obtained from the Provincial Ministries of Environment and Regional levels of Government.

2. PRODUCTS

2.1. Materials

1. Hot dipped galvannealed steel sheet (frames): to ASTM A 653M, ZF001, minimum base steel thickness in accordance with CSDFMA Table 1 - Thickness for Component Parts.

2. Hot dipped galvanized steel sheet (door panels): to ASTM A 653M, ZF001, minimum base steel thickness in accordance with CSDFMA Table 1 - Thickness for Component Parts.

3. Reinforcement channel: to CAN/CSA-G40.21, Type 44W, coating designation to ASTM A 653M, ZF001.

4. Composites: balance of core materials used in conjunction with lead in accordance with manufacturers' proprietary design.

5. Basis of Design for Steel Door Frames: Fleming TB Series, Fleming DW Series, Fleming M Series; all galvanneal

2.2. Door Core Materials

1. Honeycomb construction:

    1. Structural small cell, 25.4 mm (1”) maximum kraft paper ‘honeycomb’, weight: 36.3 kg per ream minimum, density: 16.5 kg/m^3 minimum sanded to required thickness.

2. Stiffened: face sheets welded, honeycomb, uninsulated or insulated core.

    1. Polyurethane: to CGSB 51-GP-21M rigid, modified poly/isocyanurate, closed cell board. Density 32 kg/m^3.

2.3. Adhesives

1. Select adhesives that do not contain volatile organic compounds in excess of 5% by weight.

2. Honeycomb cores and steel components: heat resistant, spray grade, resin reinforced neoprene/ rubber (polychloroprene) based, low viscosity, contact cement.

3. Polyurethane cores: heat resistant, epoxy resin based, low viscosity, contact cement.

4. Lock-seam doors: fire resistant, resin reinforced polychloroprene, high viscosity, sealant/adhesive.

2.4. Primers

1. Touch-up prime CAN/CGSB-1.181.

2.5. Paint

1. Steel doors and frames shall be field painted in accordance with Section 09 90 00 – Painting and Coatings. Weatherstrips and fire labels shall be protected from paint. Finish shall be free of scratches or other blemishes.

2.6. Accessories

1. Door silencers: single stud rubber/neoprene type.
2. Exterior and interior top and bottom caps: rigid polyvinylchloride extrusion conforming to CGSB 41-GP-19Ma.
3. Fabricate glazing stops as formed channel, minimum 16 mm (5/8") height, accurately fitted, butted at corners and fastened to frame sections with counter-sunk oval head sheet metal screws.
4. Door bottom seal: refer to Section 08 71 10 – Door Hardware: General.
5. Metallic paste filler: to manufacturer's standard.
6. Fire labels: metal riveted.
7. Sealant:
    1. Glazing components, preformed glazing channels and tapes, setting and spacer blocks, shimmed tape, glazing compound and heel bead sealant shall be structurally sufficient, durable and resilient to achieve specified performance. Materials exposed shall have resistance to weathering, oxidation, and permanent deformation and have negligible deterioration from sunlight and ozone.
    2. Sealant shall be THIOKOL type sealant, or equivalent by other approved manufacturer, and sealant shall be non-bleeding, permanently elastic under conditions and locations of installation. Size sealant joint width to require sealant to elongate or compress a maximum of 25% of joint width. Sealant cohesion and hardness qualities to ensure long life. Adhesion to non-sealant surfaces shall be obtained by use of compatible primer.
    3. In accordance with Section 07 92 10 – Joint Sealing.
8. Glazing:
    1. Glass weights: in accordance with the current edition of the BC Building Code.
    2. Glass type: in accordance with Section 08 80 50 – Glazing.
9. Make provisions for glazing as indicated and provide necessary glazing stops.
    1. Provide removable stainless steel glazing beads for use with glazing tapes and compounds and secured with countersunk stainless steel screws.
    2. Design exterior glazing stops to be tamperproof.

2.7. Frames Fabrication General

1. Fabricate frames in accordance with CSDFMA specifications.
2. Fabricate frames to profiles and maximum face sizes as indicated.
3. Exterior frames: 1.6 mm (16 gauge) welded, thermally broken type construction.
4. Interior frames: 1.6 mm (16 gauge) welded type or knock down type construction.

5. Blank, reinforce, drill and tap frames for mortised, templated hardware, and electronic hardware using templates provided by finish hardware supplier. Reinforce frames for surface mounted hardware.

6. Protect mortised cutouts with steel guard boxes.

7. Prepare frame for door silencers, three (3) for single door, two (2) at head for double door.

8. Where required, frames to be fire rated and labelled as evidence of compliance with testing procedures of the ULC or Warnock Hersey. Manufacturer's nameplates on frames and screens are not permitted. Only stamped labels are permitted on frames.

9. Conceal fastenings except where exposed fastenings are indicated.

10. Provide factory-applied touch up primer at areas where zinc coating has been removed during fabrication.

11. Insulate exterior frame components with polyurethane insulation.

2.8. Frame Anchorage

1. Provide appropriate anchorage to floor and wall construction.

2. Locate each wall anchor immediately above or below each hinge reinforcement on hinge jamb and directly opposite on strike jamb.

3. Provide two (2) anchors for rebate opening heights up to 1520 mm (5’-0”) and one (1) additional anchor for each additional 760 mm (2’-6”) of height or fraction thereof.

2.9. Frames: Welded type

1. Welding in accordance with CSA W59.

2. Accurately mitre or mechanically joint frame product and securely weld on inside of profile.

3. Cope accurately and securely weld butt joints of mullions, transom bars, centre rails and sills.

4. Grind welded joints and corners to a flat plane, fill with metallic paste and sane to uniform smooth finish.

5. Securely attach floor anchors to inside of each jamb profile.

6. Weld in 2 temporary jamb spreaders per frame to maintain proper alignment during shipment.

7. Securely attach lead to inside of frame profile from return to jamb soffit (inclusive) on door side of frame only.

8. Supply frames for glazed window openings complete with galvanized steel glazing stops, predrilled for countersunk screws.

9. Basis of design product: double rebated frames, type “DW”, by Fleming, or pre-approved equivalent.

2.10. Door Fabrication General

1. Doors: swing type, flush, with provision for glass and/or louver openings as indicated.

2. Exterior doors: polyurethane foam core. Interior doors: honeycomb construction.

3. Fabricate doors with longitudinal edges and locked seam. Seams: grind welded joints to a flat plane, fill with metallic paste filler and sand to a uniform smooth finish. Bevel doors 3 mm (1/8”) in 50 mm (2”) on hinge and lock edges.

4. Doors: manufacturers' proprietary construction, tested and/or engineered as part of a fully operable assembly, including door, frame, gasketing and hardware in accordance with ASTM E 330.

5. Blank, reinforce, drill doors and tap for mortised, templated hardware and electronic hardware.

6. Factory prepare holes 12.7 mm (1/2") diameter and larger except mounting and through-bolt holes, on site, at time of hardware installation.

7. Reinforce doors where required, for surface mounted hardware. Provide flush PVC top caps to exterior doors. Provide inverted, recessed, spot welded channels to top and bottom of interior doors.

8. Provide factory-applied touch-up primer at areas where zinc coating has been removed during fabrication.

9. Provide fire labelled doors for those openings requiring fire protection ratings, as scheduled. Test such products in strict conformance with CAN4-S104, ASTM E 152 or NFPA 252 and list by nationally recognized agency having factory inspection service and construct as detailed in Follow-Up Service Procedures/Factory Inspection Manuals issued by listing agency to individual manufacturers. **Do not paint over labels!**

10. Manufacturer's nameplates on doors are not permitted.

11. Basis of design product: type "D Series", by Fleming, or pre-approved equivalent.

2.11. Doors: Honeycomb Core Construction

1. Form each face sheet for interior doors from 1.2 mm (18 gauge) sheet steel with honeycomb core laminated under pressure to face sheets.

2.12. Doors: Insulated Hollow Steel Construction

1. Form each face sheet for exterior doors from 1.2 mm (18 gauge) sheet steel.

2. Reinforce doors with vertical stiffeners, securely welded or laminated to each face sheet at 150 mm (6") on centre maximum.

3. Fill voids between stiffeners of exterior doors with polyurethane core.

2.13. Thermally Broken Doors and Frames

1. Fabricate thermally broken doors by using insulated core and separating exterior parts from interior parts with continuous interlocking thermal break.

2. Thermal break: rigid polyvinylchloride extrusion conforming to CGSB 41-GP-19Ma.

3. Fabricate thermally broken frames separating exterior parts form interior parts with continuous interlocking thermal break.

4. Apply insulation.

3. EXECUTION

3.1. Installation General

1. Install labelled steel fire rated doors and frames to NFPA 80 except where specified otherwise.

2. Install doors and frames to CSDFMA Installation Guide.

3.2. Frame installation

1. Set frames plumb, square, level, at correct elevation and free of twists or bows.

2. Secure anchorages and connections to adjacent construction.

3. Brace frames rigidly in position while building-in. Install temporary horizontal wood or 1.8 mm (1/16") steel channel spreader at third points of door opening to maintain frame width. Provide vertical support at centre of head for openings over 1200 mm (4'-0") wide. Remove temporary spreaders after frames are built-in.

4. Make allowances for deflection of structure to ensure structural loads are not transmitted to frames.

5. Caulk perimeter of frames between frame and adjacent material.

6. Maintain continuity of air barrier and vapour retarder.

3.3. Door Installation

1. Install doors and hardware in accordance with hardware templates, manufacturer's instructions and Section 08 71 10 – Door Hardware General.

2. Maximum permissible warp measured diagonally across door is 1.5 mm (1/16"). Remove doors from job site doors exceeding this warp and replace with compliant door at no cost to the Owner.

3. Provide even margins between doors and jambs and doors and finished floor and thresholds as follows.

    1. Hinge side: 2 mm (3/32").

    2. Latchside and head: 2 mm (3/32").

    3. Finished floor, noncombustible sill and thresholds: 13 mm (1/2").

4. Adjust operable parts for correct function.

5. Install louvres.

3.4. Finish Repairs

1. Touch up with primer finishes damaged during installation.

2. Fill exposed frame anchors and surfaces with imperfections with metallic paste filler and sand to a uniform smooth finish.

3.5. Glazing

1. Install glazing for doors and frames in accordance with Section 08 80 50 – Glazing.

3.6. Clean-up

1. Remove all protective coverings from doors during final clean up. Promptly as the work proceeds, and on completion, remove all excess and waste materials and packaging. Ensure all doors, frames, glazing and louvres are free from dirt, grease, oil and damage.

END OF SECTION

1. GENERAL

1.1. Summary

1. Refer to architectural drawings in conjunction with the specification.

1.2. Section Includes

1. Provide all labour, materials, tools and other equipment, services and supervision for the supply and installation of all aluminum doors, windows and frames as indicated on the drawings, as listed on the door schedule and as specified herein.

1.3. Related Sections

1. 06 10 10 - Rough Carpentry
2. 07 62 00 - Sheet Metal Flashing and Trim
3. 07 92 10 - Joint Sealing
4. 08 71 10 - Door Hardware: General
5. 08 80 50 - Glazing
6. 09 90 00 - Painting and Coatings
7. Refer to electrical drawings for connections to door controls.

1.4. Design Criteria

1. Structural design: design glass, framing members, and anchorage to the requirements of the BC Building Code for wind, seismic, guard, and human impact loads. Allow for deflection of building structure. Ensure no structural loads are imposed on storefront framing or doors. Engage Registered Professional Engineer to review structural design and attachment to building structure, seal shop drawings, carry out field reviews, and submit sealed letter of assurance stating that the window and door installation conforms to sealed shop drawings.
2. Section to also include perimeter trims, stools, accessories, shims and anchors, and perimeter sealing of curtain wall framing.
3. Air leakage through the fixed lite areas of the storefront not to exceed 0.3 L/s·m^2 at 75 Pa when tested to ASTM E 283.
4. Water penetration resistance: no uncontrolled water penetration when tested to ASTM E 331 at a test pressure of 290 Pa.
5. Comply with BC Energy Efficiency Standards Regulation for manufactured fenestration products.
6. Thermally broken, the grid members shall have a condensation resistance equal to or better than the area along the bottom of a 25 mm (1") sealed glass unit with standard metal spacer edge construction.

1.5. Samples

1. Submit samples in accordance with Section 01 33 00 – Submittal Procedures.
2. Submit one 300 x 300 mm (1’-0” x 1’-0”) corner sample of each type door and frame.
3. Submit sample showing glazing detail, reinforcement, finish and location of manufacturer’s nameplates.
4. Frame sample to show glazing stop, door stop, jointing detail, finish, and wall trim.

1.6. Shop Drawings

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

2. Submit catalogue details for each type of door and frame illustrating profiles, dimensions and methods of assembly.

3. Submit shop drawings showing design loads, frame reinforcing, insulating glass makeup, installation clearances, expected building deformations, as well as shimming and anchorage requirements for the expected design loads for that location. Show all sealants, flashings and membranes required to ensure continuity of building envelope critical barriers to the fenestration system. Shop drawings shall bear the seal of a professional engineer registered in British Columbia.

4. Submit certified copies of laboratory test reports from an approved independent testing agency to demonstrate storefront system compliance with air infiltration and water penetration resistance requirements.

5. Submit written evidence of insulating glass certification to ASTM E 2190. The certification must apply to the insulating glass makeup used in the fenestration products.

6. Paints, coatings, adhesives and sealants must not contain methylene chloride and perchloroethylene. Paints and coatings must meet Canadian Volatile Organic Compound (VOC) Concentration Limits for Architectural Coatings Regulations (SOR/2009-264). Adhesives and sealants must meet SCAQMD Rule 1168, effective July 1, 2005.

7. Submit Schedule S-B Assurance of Design and Schedule S-C Assurance of Field Review for fenestration product design and anchoring on completion of the installation.

1.7. Maintenance Data.

1. Provide operation and maintenance data for cleaning and maintenance of aluminum finishes for incorporation into manual specified in Section 01 78 00 – Closeout Submittals.

1.8. Delivery, Handling and Storage

1. Deliver no doors, windows or frames until conditions are suitable and doors, windows and frames are actually required for installation.

2. Store all doors, windows and frames in a dry place free from extremes of temperature, properly stacked and protected according to manufacturer’s recommendations.

1.9. Protection

1. Leave protective covering in place until final cleaning of building.

1.10. Warranty

1. Sealed units to have a minimum warranty period of ten (10) years against failure of glazing unit seals and deposits on interior glass faces detrimental to vision.

1.11. Quality Assurance

1. Air infiltration to ASTM E283. Air infiltration rate maximum 0.06 cfm/ft2 at a static air pressure different of 6.24 psf.

2. Water resistance to ASTM E331. Leakage at a minimum static air pressure different of 8 psf (290 Pa) as defined in AAMA 501.

3. Uniform Load: A static design load of 20 psf applied in the positive and negative direction in accordance with ASTM E 330. No deflection in excess of L/175 of the span of any framing member. At a structural test load equal to 1.5 times the specified design load, no glass breakage or permanent set in the framing members in excess of 0.2% of their clear spans shall occur.

4. Product to comply with the specified performance requirements without failure due to defective manufacture, fabrication, installation, or other defects in construction, as determined by testing of glazed aluminum curtain walls representing those indicated for this project.

5. Glazed aluminum curtain walls shall withstand movements of supporting structure including, but not limited to, story drift, twist, column shortening, long-term creep, and deflection from uniformly distributed and concentrated live loads.

6. Failure includes any of these events:

    a. Thermal stresses transferring to building structure

    b. Glass breakage

    c. Loosening or weakening of fasteners, attachments, and other components

    d. Failure of operating units

2. PRODUCTS

2.1. Materials

1. Standard of Acceptance: Ground level openings 2” x 6” Kawneer 1620UT Aluminum window frame, black anodized.

2. Standard of Acceptance: Clerestory openings, Raico Therm + H-1/H-V Black Anodized

3. Aluminum extrusions: Aluminum Association alloy AA6063-T5 anodizing quality.

4. Sheet aluminum: Aluminum Association alloy AA1100-H14 or AA5005-H32 or H34 anodizing quality.

5. Steel reinforcement: to CAN/CSA-G40.21, grade 300W.

6. Fasteners: aluminum, cadmium plated steel, or stainless steel (where exposed), finished to match adjacent material, and to be non-corrosive and compatible with aluminum components.

7. Weatherstrip: replaceable plastic backed wool pile.

8. Door bumpers: black neoprene.

9. Door bottom seal: operable and adjustable door seal of anodized extruded aluminum frame and vinyl weather seal, recessed in door bottom, closed ends, automatic retract mechanism when door is open.

10. Isolation coating: alkali resistant bituminous paint or epoxy resin solution for areas where aluminum comes into contact with steel supports or concrete.

11. Glass: tempered glass to CAN/CGSB-12.1, Type 1, Class B.

12. Glazing materials: refer to Section 08 80 50 – Glazing.

13. Sealants: refer to Section 07 92 10 – Joint Sealing, colour selected by Consultant.

2.2. Aluminum Doors

1. Basis of design products (ground floor): “1620UT” by Kawneer; or pre-approved equivalent.

2. Construct doors of porthole extrusions with minimum wall thickness of 3 mm.

3. Door stiles: nominal 89 mm (3-1/2”) wide plus or minus 6 mm.

4. Top rail: nominal 89 mm (3-1/2”) wide plus or minus 6 mm.

5. Bottom rail: nominal 165 mm (6-1/2”) wide plus or minus 6 mm.

6. Reinforce mechanically joined corners of doors to produce sturdy door unit.

7. Glazing stops: interlocking snap-in type for dry glazing. Exterior stops: tamperproof type.

8. Provide thermally broken doors for exterior.

9. Security latch protector: stainless steel, 305 mm (12” high).

10. Hardware, general:

1	Pivots:	“Kawneer/Raico Top, Intermediate & Bottom Offset Pivots” - coordinate with automatic opener where appropriate; intermediate with wiring for access control applications”
2	Deadlock:	“Adams Rite MS-1850A Dead Lock”
3	Flush Bolt:	“Kawneer/Raico Flush Bolt”
4	Latch Lock:	“Adams Rite 4710 Latch Lock 4560 Handle”
6	Latch Strike:	"Adams Rite 7130 Electric Strike”
7	Cylinder:	“Kawneer/Raico Keyed and Thumbturn cylinders”
8	Exit Device:	“Falcon 2090” rim type
10	Automatic Closer:	See below.
11	Pull:	“CPN Pull”, colour to match doors.
12	Threshold	Thermally broken mill aluminum extrusion; wheelchair accessible.

11. Hardware, Automatic Power Operated Swing Doors: meet the requirements of ANSI A156.10, ANSI 156.19 and CSA/ ULC.

    1. Equipment.

        1. Basis of design product (Exterior Automatic Power Operator): Camden Door Controls 42” Post, Dual Prep, black anodized aluminum finish w/ 2 CM-45/4 push plate switches

        2. Basis of design product (Interior Automatic Power Operator): SASI Sensor access systems WZ-369CS)

        3. Completely assembled and sealed unit which shall include helical gear-driven transmission, overriding clutch (to provide easy manual operation, spring-close), mechanical spring/ bearings and filled with special lubricant for extreme temperature conditions. Attached to transmission system shall be a DC shunt-wound permanent magnet motor with sealed ball bearings.

4. Housing – extruded aluminum fully enclosed housing, acting as door header (concealed operator - not surface mounted), 140 mm high x 152 mm deep (5-1/2" x 6"). Side access cover.

2. Operation.

1. Exterior activator

1. Provide stainless steel push plate switch, 114 x114 mm (4-1/2" x 4-1/2") square, with accessibility symbol and "press to open" text.

2. Provide exterior mounted tamperproof card reader. Coordinate operation of automatic opener with entry phone for visitor access. Refer to electrical drawings for entry phone specifications.

3. Basis of design product: "square press switch HC PTO" by Camden, or pre-approved equivalent.

2. Interior activator

1. Provide stainless steel push plate switch, 114 x114 mm (4-1/2" x 4-1/2") square, with accessibility symbol and "press to open" text.

2. Basis of design product: "square press switch HC PTO" by SASI Sensor Access Systems, or pre-approved equivalent.

3. Manual operation – in the event of a power failure the door shall close as if equipped with a manual door closer and shall open with a force in accordance with ANSI 156.19.

3. Features.

1. The control shall include an adjustable (0 to 60 s) time delay module.

2. Provide an electric strike connected to operating devices.

3. Provide door mounted safety sensors.

4. Provide interface relay to coordinate auto opener with electric strike.

5. Provide an automatic locking system.

6. Weather stripping – provide an interface between doors, frame and sidelight panels.

7. Self-contained unit including necessary transformer, relays, rectifiers, and other electronic components for proper operation. Relays shall be plug-in type for individual replacement.

8. Door operation shall not require any fluids or gases under pressure to be used in opening and closing of door.

9. Manual door operation requires less than 12 lbs of force applied to door stile.

4. Referenced Standards.

1. Comply with all applicable standards including, but not limited to, ANSI 156.19.

2.3. Aluminum Frames

1. Construct thermally broken and insulated frames of aluminum extrusions with minimum wall thickness of 3 mm.

2. Frame members: 51 x 152 mm (2”x6”) nominal size, thermal, centre plane, screw spline fabrication.

3. Basis of design products:

    1. Ground Floor Storefront: “1620UT” by Kawneer black anodized; or pre-approved equivalent.

    2. Clerestory Windows: Raico Therm + H-1/H-V black Anodized

2.4. Aluminum Finishes

1. Finish exposed surfaces of aluminum components in accordance with Aluminum Association Designation System for Aluminum Finishes.

    1. Impregnated colour anodic finish: designation AA-M12C22A43, colour to match Consultant’s sample.

2. Appearance and properties of anodized finishes designated by the Aluminum Association as Architectural Class 1, Architectural Class 2, and Protective and Decorative.

2.5. Steel Finishes

1. Finish steel clips and reinforcing steel with steel primer to CGSB 1-GP-40M or zinc coating to CSA G164.

2.6. Fabrication

1. Doors and framing to be by same manufacturer.

2. Fabricate doors and frames to profiles and maximum face sizes as shown. Provide minimum 22 mm bite for insulating glazed units.

3. Provide structural steel reinforcement as required.

4. Fit joints tightly and secure mechanically.

5. Conceal fastenings.

6. Mortise, reinforce, drill and tap doors, frames and reinforcements to receive hardware using templates provided under Section 08 71 10 – Door Hardware: General.

7. Isolate aluminum from direct contact with dissimilar metals, concrete and masonry.

3. EXECUTION

3.1. Installation

1. Set frames plumb, square, level at correct elevation in alignment with adjacent work.

2. Anchor securely.

3. Install doors and hardware in accordance with hardware templates and manufacturer’s instructions.

4. Adjust operable parts for correct function.

5. Make allowances for deflection of structure to ensure that structural loads are not transmitted to frames.

3.2. Glazing

1. Glaze aluminum doors and frames in accordance with Section 08 80 50 – Glazing.

3.3. Caulking.

1. Seal joints to provide weathertight seal at outside and air, vapour seal at inside.

2. Apply sealant in accordance with Section 07 92 10 – Joint Sealing. Conceal sealant within the aluminum work except where exposed use is permitted by Consultant.

3.4. Clean-up

1. Remove all protective coverings from doors during final clean-up. Promptly as the work proceeds, and on completion, remove all excess and waste materials and packaging. Ensure all doors, windows and frames are free from dirt, grease, oil and damage.

END OF SECTION

1. GENERAL

1.1. Summary

1. Refer to architectural drawings in conjunction with the specification.

1.2. Section Includes

1. Flush Wood Doors and Transom Panels
2. Fire-Rated Wood Doors.
3. Wood Louvers, Glass Stops, and Astragals.
4. Glazing.
5. Factory finishing.

1.3. Section Excludes

1. Cabinet doors.
2. Metal or Vinyl doors with wood cores.
3. Garage, Metal, and Fiberglass doors.
4. Metal grills or Louvers.
5. Glazing.

1.4. Related Sections

1. 08 71 10 - Door Hardware: General
2. 09 90 00 - Painting and Coatings

1.5. References

1. Architectural Woodwork Standards, latest edition, published jointly by the Architectural Woodwork Institute, the Architectural Woodwork Manufacturer Association of Canada, and the Woodwork Institute.

1.6. Submittals

1. Make submittals in accordance with Section 01 33 00 – Submittal Procedures.
2. Shop Drawings:
    1. Submit shop drawings in conformance to the requirements of the Architectural Woodwork Standards.
    2. Submit two copies, one of which will be returned with reviewed notations. Make corrections noted (if any), and distribute required copies prior to the start of work.
3. Samples.
    1. Submit two finished samples of each species and cut of wood to be used. Veneer samples to be minimum 300 mm x 300 mm (12”x12”) . Samples shall represent the range of color and grain expected to be provided.
    2. Submit four additional samples of each material for the use of the paint trade.

1.7. Quality Assurance

1. Work shall be in accordance with the Grade or the Grades Specified of the Architectural Woodwork Standards.

1.8. Delivery, Storage and Handling

1. Deliver materials only when the project is ready for installation and the general contractor has provided a clean storage area.
    1. Delivery of architectural millwork shall be made only when the area of operation is enclosed, all plaster and concrete work is dry and the area broom clean.
    2. Maintain indoor temperature and humidity within the range recommended by the Architectural Woodwork Standards for the location of the project.

1.9. Schedule

1. Coordinate fabrication, delivery, and installation with the general contractor and other applicable trades.

2. PRODUCTS

2.1. Components

1. Flush Wood Doors, Opaque Finish - for pocket door?
    1. Non-rated and 20-minute rated: WDMA SCLC-5, structural composite lumber core.
    2. Face: MDO, painted (refer to finishes schedule).
    3. Thickness: 45 mm (1-3/4”).
    4. Minimum 32 mm (1-1/4”) stiles prior to trim.
    5. Minimum 51 mm (2”) top & bottom rails prior to trim.
    6. Reinforced blocking required for all surface mounted hardware when thru bolts are not use in the installation of the hardware.
    7. Stiles and rails securely bonded to the core with adhesive, then bonded assembly machine calibrated prior to application of face components to achieve minimal telegraphing per section T-1.
    8. Construct 20 minute rated pairs so that no metal edge and/or astragal is required.
    9. Basis of design product: “LD3500 SCLC-5” by Lynden Door, or pre-approved equivalent.
2. Flush Wood Doors, Opaque Finish, Hollow Core – interior swing, bypass and pocket for pocket door?
    1. Non-rated: expanded honeycomb core.
    2. Face: flush tempered hardboard, painted (refer to finishes schedule).
    3. Thickness: 45 mm (1-3/8”).
    4. Frames: finger jointed SPF, primed and painted or metal (refer to 08 11 14 Metal Doors and Frames). Provide valance to cover exposed tracks for bi-pass doors.
    5. Basis of design product: “SD10” by Lynden Door, or pre-approved equivalent.
3. Hardware, general info for pocket door

1.

3. EXECUTION

3.1. Examination

1. Verify that frames are set square, plumb, level, and in plane. Report openings that are not within tolerance to the General Contractor for correction before hanging doors.

3.2. Installation

1. Install all work in conformance with the Architectural Woodwork Standards, latest edition. Installation shall conform to the AWS Grade of the items being installed.

2. Doors shall be secured in place, square, plumb, and level.

3. Hardware shall be installed complete and as recommended by the manufacturer.

3.3. Adjusting and Touchup

1. Before completion of the installation, the installer shall adjust all moving and operating parts to function smoothly and correctly.

2. All nicks, chips, and scratches in the finish shall be filled and retouched. Damaged items which cannot be repaired shall be replaced.

3.4. Cleanup

1. Upon completion of installation, the installer shall clean all installed items of pencil and ink marks, and broom clean the area of operation, depositing debris in containers provided by the general contractor.

END OF SECTION

1. GENERAL

1.1. Summary

1. Refer to architectural drawings in conjunction with the specification.

1.2. Section Includes

1. Provide all labour, materials, tools and other equipment, services and supervision for the complete fabrication, supply, finishing and installation of all panel doors and frames and as indicated on the drawings and as specified herein.

2. The supply and installation of tempered glass to all pressed window frames, including the installation of glazing stops.

3. The supply and installation of all necessary anchors, clips, head and sill flashings.

4. The installation of all finish hardware, including thresholds, sweeps, closers, weatherstripping, and locksets.

1.3. Related Sections

1. 06 10 10 - Rough Carpentry

2. 07 92 10 - Joint Sealing

3. 08 71 00 - Door Hardware: General

4. 08 80 50 - Glazing

5. 09 90 00 - Painting and Coatings

1.4. References

1. ANSI/DASMA 102 - American National Standard Specifications for Sectional Overhead Type Doors.

1.5. Design Requirements

1. Design exterior frame assembly to accommodate to expansion and contraction when subjected to minimum and maximum surface temperature of minus 35°C to 45°C.

2. Provide wind load: Design and size components to withstand loads caused by pressure and suction of wind acting normal to plane of wall as calculated in accordance with applicable code.

3. Single-Source Responsibility: Provide doors, tracks, motors, and accessories from one manufacturer for each type of door. Provide secondary components from source acceptable to manufacturer of primary components.

1.6. Submittals,

1. Submit shop drawings in accordance with Section 01 33 00 – Submittal Procedures, prior to manufacture.

    1. Shop drawings shall clearly show door assemblies, hardware, operating components including adjacent construction. Show elevations, sections, and details and clearances required for adjacent door assemblies.

    2. Shop drawings shall be of best quality craftsmanship, specifically prepared on standard architectural size drawing sheets.

2. Provide manufacture's data sheet, certificates and operations and maintenance data.

3. Door manufacturer to provide complete installation instructions for doors and hardware.

4. Indicate each type of door, material, steel core thicknesses, mortises, reinforcements, location of exposed fasteners, openings, glazed and/or louvred, arrangement of hardware, fire rating and finishes.

5. Indicate each type frame material, core thickness, reinforcements, glazing stops, location of anchors, exposed fastenings, reinforcing, fire rating, finishes, and frame head, jamb, mullion and sill sections.

6. Indicate handing of all openings, and quantities of glazed walls and panel doors to be provided.

7. Include schedule identifying each unit, with door marks and numbers relating to numbering on drawings and door schedule.

1.7. Quality Assurance

1. Panel Doors to conform to requirements of the AHJ and CAN/CSA-A440-98, specifically:

    1. Air Tightness, fixed sections: maximum air leakage of 0.25 m^3/hr/m of frame perimeter, A3 minimum.

    2. Water Tightness, fixed lites: B5; able to resist a pressure differential of 500 Pa for 15 minutes.

    3. Wind Load Resistance, fixed lites: C3 window rating.

2. Maximum deflection while the door is open horizontal position shall not exceed 1/120 of the span.

3. Provide a written guarantee covering all panel doors and frames supplied under this section against deformation or other defects for a period of one year after delivery to the site. Replace at no extra charge and refinish to match, any defective doors and frames appearing within the guarantee period.

4. Manufacturer Qualifications: Company specializing in manufacturing products specified in this section with minimum five years documented experience.

5. Installer Qualifications: Authorized representative of the manufacturer with minimum five years documented experience.

6. Products Requiring Electrical Connection: Listed and classified by Underwriters Laboratories of Canada, Inc. acceptable to authority having jurisdiction as suitable for purpose specified.

1.8. Product Delivery, Storage and Handling

1. Deliver all panel doors and frames to the job site, factory sealed and wrapped as necessary to prevent deterioration and damage. Doors to be prefitted for hardware. Store in accordance with the manufacturer's recommendations.

1.9. Waste Management and Disposal

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

2. Place materials defined as hazardous or toxic waste in designated containers.

3. Ensure emptied containers are sealed and stored safely for disposal away from children.

4. Set aside and protect surplus and uncontaminated waste finish materials. Deliver to, or arrange collection by employees, individuals, or organizations for verifiable re-use or re-manufacturing.

5. Place materials defined as hazardous or toxic waste in designated containers, and place used sealant and adhesive tubes and containers in areas designated for hazardous waste.

6. Return solvent and oil soaked rags, used during installation, for contaminant recovery, proper disposal, or appropriate cleaning with no contaminant release to water systems.

7. Close and seal tightly all partly used sealant and adhesive containers and store protect in well-ventilated, fire-safe area at moderate temperature.

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

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

10. Collect wood packing shims and pallets and place in designated area for recycling and reuse.

11. Do not dispose of paints or solvents by pouring on the ground. Place in designated containers and ensure proper disposal in accordance with federal, provincial and municipal regulations.

12. Solvent based paints, which cannot be reused must be treated as hazardous waste and disposed of in an appropriate manner in accordance with hazardous waste regulations. Empty paint cans are to be dry prior to disposal or recycling (where available).

13. Where paint recycling is available collect all waste paint by type and provide for delivery to recycling or collection facility.

14. Paints and finishes are regarded as hazardous products and are subject to regulations for their disposal. Information on these controls can be obtained from the Provincial Ministries of Environment and Regional levels of Government.

2. PRODUCTS

2.1. Materials

1. Standard of Acceptance: Esteem Garage Door by Steel-Craft Door Products Ltd.

    1. Alternate: Alumatite Door model A175 1 3/4” thick aluminum construction as manufactured by Richards-Wilcox Canada, inc.

    2. Requests for substitutions will be considered.

2.2. Door Section

1. Section assembly: Door sections shall be fabricated from 1 3/4 inch (45 mm) thick hollow aluminum alloy extrusions, the stile and rail shall be assembled using 1/4 inch (6 mm) diameter bolts. Section framing shall be fabricated from 6036-T6 tubular aluminum alloy extrusions, the extrusion wall shall be thick at the hardware mounting locations at all hardware locations.

2. Trusses: Provide adequate number of galvanized steel linear type reinforcing trusses to meet the wind loading.

3. Center Stiles: 2 inch (51 mm) wide.

4. End Stiles: Single stiles 3-3/8 inches (86 mm) wide. Doors width 16’-3” (4953 mm) and over shall all have double 5-7/8 inches (162 mm) wide end stiles.

5. Top and bottom rails: As recommended by the door manufacturer, the single rail shall be 3- 3/8 inches (86 mm) wide and the double rail shall be 6-3/8 inches (162 mm)

6. Paneling as shown on the architectural drawings.

7. Aluminum Panels: 0.051 inch (1.3 mm) thick embossed aluminum sheets.Insulated Kick Panels: 1/2 inch (12.7 mm) thick insulation covered on both sides with embossed sheets.

8. Full vision sections as shown on the architectural drawings. Glazing 1/2 inch (12.7 mm sealed tempered glass.

9. Seals: Continuous replaceable dual seals between sections.

10. Door Finish as shown on the architectural drawings.

2.3. Hardware

1. Standard of Acceptance: Linear Hardware system as by manufacturer.
    1. Alternate: Linear Hardware System as manufactured by Richard-Wilcox Canada. Doors over 16'-2" (4928 mm) wide shall be equipped with double end roller brackets and long stem rollers.

2. Finish: Door hardware, tracks and track mounting hardware and torsion assembly mounting brackets, fabricated from commercially galvanized steel to ASTM A653/A653M.

3. Track: 12ga (2.75 mm) thick, commercial galvanized roll formed track 3 1/8 inch (80 mm) overall outside dimension. Horizontal track curve available in 16 inch (406 mm) radius.

4. Vertical Track Mounting: Adjustable Continuous Track Angle (ADCA) bolted type, field adjustable, sloped to ensure weather tight seal, shall be fabricated from 13ga (2.4mm) commercially galvanized steel, designed to provide continuous tracks support for vertical track. Combination angle and clip mounting not acceptable.

5. Hinges: Standard hinges fabricated from 12ga (2.75 mm) thick galvanized steel with embossments designed to resist higher load and to provide greater stability and improved performance. Doors width 16'-3" (4953 mm) and over shall have double end hinges.

6. Track Hangers: Minimum 1 1/4" x 1 1/4" x 0.078" (32 x 32 x 2 mm) galvanized steel angles suitably spaced to transmit door weight to the building structure.

7. Weather-stripping: Doors shall be equipped with a heavy duty, factory installed continuous top seal to seal against header, continuous co-polymer joint bulb seal between sections and vinyl bulb shaped astragal on the bottom edge of the door. Dual Durometer vinyl jamb weather seal bolted to the continuous adjustable mounting angle (ADCA) for easy replacement, as supplied by manufacturer.

8. Rollers: Steel rollers 3 inch (76 mm) diameter, with ten (10), 5/16 inch (8 mm) diameter ball bearings, 7/16 inch (11 mm) diameter roller axles and both inner and outer ball races of hardened steel. Length of roller stem as required.

9. Roller Brackets: Fabricated from 12ga (3.1 mm) galvanized steel.

10. Shaft and Counter Balance Springs: Helically wound torsion springs manufactured from oil tempered spring wire stress relieved, minimum 10,000 cycles. Aluminum die cast grooved drums and flexible galvanized aircraft cables, 7 x 19 construction, mounted on 1 inch (25.4 mm) CRS solid steel shaft, keyed full length, mounted on ball bearings

11. Locking Bolt: Manufacturer's standard on the interior for manual doors, slide type bolt to engage in vertical track. Single action bolt to permit padlocking, (right or left handed, as requested by Consultant).

12. Foot Plate/Handle: Provide door manufacturer's standard heavy-duty foot plate/handle at bottom section for manually operated doors, fastened the bracket securely to inside face of door. Location as per reviewed shop drawings.

13. Bumper springs to be installed at the end of each horizontal track to stop door travel.

14. Track Guards: Continuous 3/16" thick x 5'-0" (4.5 mm x 1524 mm) high, chamfered 45 degree at

top, gray prime finish.

15. Door size and hardware lift type as shown in door schedule and/or drawings.

2.4. Electric Operator

1. Provide jack shaft type electric operators, as shown on Drawings, to operate the door at approximate speed of 8 inch (200 mm) per second.
2. Jack Shaft operator: Lift Master industrial duty logic control type operator with on board radio receiver, model “H” to NEMA 1, shall be equipped with an adjustable friction clutch, time delay on reverse, solenoid brake integral enclosure containing the controls and floor level disconnect and emergency manual chain hoist assembly with electrical interlock, motor, voltage and power provided as per manufacturer’s reccomendation for best pratices.
3. Provide one push button station “OPEN/CLOSE/STOP” to NEMA 1, for inside wall mounting near the door jamb on the operator side.
4. Provide and install a “Featheredge” Reversing Safety Edge along the bottom edge of door to reverse on contact with an object as supplied by Service Door Industries. Hose type pneumatic safety edges will not be accepted. Power to the safety edge shall be supplied through reelite.
5. Power supply and fused disconnect near the opening on the operator side. Wiring from the fused disconnect to the operator and to the controls by the door contractor.

2.5. Fabrication

1. Fabricate the work true to dimensions detailed and square, and to the reviewed shop drawings, free from distortion and defects detrimental to the appearance and performance.
2. Verify the door opening dimensions prior to the fabrication of the doors.
3. Doors shall be 1 inch (25.4 mm) higher than finished openings and extend 1 inch (25.4 mm) beyond jamb on either side of finished opening width.
4. Shop and field connections shall comply with CAN/CSA S16.1-M.
5. Accurately fit joints and intersecting members with adequate fastenings.

3. EXECUTION

3.1. Installation General

1. Prior to commencement of work of this Section, thoroughly examine opening frames and frame extensions to receive the doors and related components for installation. Ensure that the opening frames are square and plumb. Ensure that the floor is level and square to building lines, so that the door properly seal against the frame and floor. Commencement of the overhead door installation constitutes acceptance of the opening conditions, any subsequent problems arising during the door installation will be the responsibility of the door installer.
2. Report to the Consultant in writing of any condition adversely affecting this work.
3. Proceed with the installation of the doors only when site conditions are satisfactory for the installation.
4. Verify electric power is available and of correct characteristics

3.2. Frame installation

1. Verify electric power is available and of correct characteristics

2. Installation shall be by door manufacturer or by authorized manufacture's representative for the region, as specified herein.

3. Install doors, tracks and operating equipment complete with necessary hardware, weather-stripping, anchors, hangers, brackets and accessories, in accordance to manufacturer's printed instructions.

4. Set frames plumb, square, level, at correct elevation and free of twists or bows.

5. Isolate metals where necessary to prevent corrosion due to contact with dissimilar metals and between metals, masonry and concrete. Use bituminous paint or butyl tape or as recommended, in writing, by the door manufacturer.

6. Supply written instructions, drawings, and where necessary provide supervision for the installation of items to be built in by work of other Sections.

7. Steel member's etc. including jamb extensions and spring pads, by manufacturer guidelines and as per structural drawings. All other mounting brackets, angles etc., required for the proper installation of work of this Section, shall be the responsibility of the door manufacturer.

8. Secure anchorages and connections to adjacent construction.

9. Make allowances for deflection of structure to ensure structural loads are not transmitted to frames.

10. Caulk perimeter of frames between frame and adjacent material.

11. Maintain continuity of air barrier and vapour retarder.

12. Complete installation must be to the satisfaction of the Consultant. Any and all aspects of installation adversely affecting appearance and/or performance of such installation shall be deemed unacceptable and shall be fully replaced at no additional cost to the Owner.

3.3. Door Installation

1. Install sectional door in strict accordance with final reviewed shop drawings, manufacturer's instructions and as specified herein.

2. Clean surfaces thoroughly prior to installation.

3. Install doors and hardware in accordance with hardware templates, manufacturer's instructions and Section 08 71 10 – Door Hardware General.

4. Maximum permissible warp measured diagonally across door is 1.5 mm (1/16"). Remove doors from job site doors exceeding this warp and replace with compliant door at no cost to the Owner.

5. Fit, align and adjust overhead door assemblies, level and plumb, to ensure smooth operation and to provide correct closure to the satisfaction of the Consultant.

6. Ensure that complete installation includes tracks, operating equipment, necessary hardware, weather- stripping, anchors, hangers, brackets and any other accessories deemed necessary. Include any other items, not specified herein, but is required for a complete installation.

7. Adjust operable parts for correct function.

3.4. Hardware

1. Install all necessary hardware, jamb and head mold strips, anchors, inserts, hangers and equipment supports in accordance with final reviewed shop drawings, manufacturer's instructions and as specified herein.

2. Mount counterbalancing mechanism with brackets at each end of shaft and at maximum 8'-0"

(2438 mm) o/c. in between.

3. Fasten vertical track assembly to opening frame at maximum 1'-8" (508 mm) o/c. vertically. Install additional track anchors where deemed necessary by the Consultant.

4. Support the horizontal track to transmit the door dead and operating loads to the building structure. Install sufficient supports, anchors, fasteners etc. so that the track assembly is rigid and free from undue movement as required by the door manufacturer and to the satisfaction of the Consultant. Install additional track anchors where deemed necessary by the Consultant.

5. Provide bumper springs at the end of each track of manually operated doors.

6. Ensure that weather-stripping is securely fastened and adjusted to provide effective seal.

3.5. Finish Repairs

1. Touch up with primer finishes damaged during installation.

2. Protect installed products until completion of project.

3. Touch-up, damaged coatings and finishes and repair minor damage before Substantial Completion.

3.6. Glazing

1. Install glazing for doors and frames in accordance with Section 08 80 50 – Glazing.

3.7. Adjustment and Demonstration

1. Lubrication:

    1. Upon completion of installation of doors and operating equipment, lubricate moving parts before operation.

    2. Grease sprockets, bearings, cables, link chains and guides. Lubricant shall be as recommended by the manufacturer.

2. Demonstration:

    1. Test the door operation and adjust doors for smooth operation, free from warp, twist or distortion. Demonstrate the operation to the satisfaction of the Consultant at the same time of acceptance of the completed work.

    2. Submit to the Owner a copy of proposed preventative maintenance program for overhead doors and other related components requiring regular maintenance and check-ups.

3.8. Clean-up

1. Remove all protective coverings from doors during final clean up. Promptly as the work proceeds, and on completion, remove all excess and waste materials and packaging. Ensure all doors, frames, glazing and louvres are free from dirt, grease, oil and damage.

END OF SECTION

1. GENERAL

1.1. Summary

1. Refer to architectural drawings in conjunction with the specification.

1.2. Section Includes

1. The supply of finish hardware including all door-operating hardware, such as hinges, handles, bolts, latches, locksets, closers, kick plates and similar items and accessories, including all necessary installation templates, and thresholds and weather stripping as required to make doors functional.

1.3. Related Sections

1. 08 11 14 - Metal Doors and Frames
2. 08 11 16 - Aluminum Doors and Frames
3. Refer to electrical drawings for push button details.

1.4. Requirements Regulatory Agencies

1. Hardware for doors in fire separations and exit doors certified by a Canadian Certification Organization accredited by Standards Council of Canada.

1.5. Samples

1. Submit samples in accordance with Section 01 33 00 – Submittal Procedures.
2. Identify each sample by label indicating applicable specification paragraph number, brand name and number, finish and hardware package number.
3. After approval samples will be returned for incorporation in the Work.

1.6. Hardware Schedule (Shop Drawings)

1. Submit a detailed finish hardware schedule prepared by an Architectural Hardware Consultant (AHC) in accordance with Section 01 33 00 – Submittal Procedures showing each separate type of item including make, model, material, function, size, finish, and other pertinent information.
2. Schedule and detail each floor or unit separately. On doors of different sizes or where hinges, closer or locks are different, use a separate heading.
3. Furnish templates for installation of hardware to all parties responsible for installation of hardware or for preparing their work to receive it.
4. If requested, supply a sample of each hardware item for review with the shop drawings. After comparison of reviewed samples with hardware delivered to the project, the samples will be returned for incorporation in the Work.
5. Prepare and submit keying schedules for review by Owner. Provide the Owner with one copy of the manufacturer’s key biting list, forwarded together with the keys specified.

1.7. Maintenance Data

1. Provide two (2) copies of operation and maintenance data, manufacturer’s parts list, manufacturer’s instructions for door closers, lock and latch sets, door holders, panic (exit) hardware for incorporation into manual specified in Section 01 78 00 – Closeout Submittals.
2. Brief maintenance staff regarding proper care, cleaning, and general maintenance.

1.8. Maintenance Materials

1. Provide maintenance materials in accordance with Section 01 78 00 – Closeout Submittals. Provide one copy of representative templates, instruction sheets, hardware schedule and keying schedule, all in the form of a bound reference manual, for the Owner's maintenance purposes.

2. Supply three (3) sets of wrenches for door closers, locksets, and fire exit hardware.

1.9. Quality Assurance

1. Provide a one (1) year guarantee for all finish hardware except for exit devices which must have a five (5) year guarantee, closers with twenty five (25) years, locksets with five (5) years.

2. The firm furnishing hardware shall be regularly engaged in the sale of builders hardware for commercial and multiple residential projects in the British Columbia market.

3. The individual responsible for scheduling, detailing, ordering and coordinating hardware for this project shall be an experienced hardware consultant. Consultant membership in the Door and Hardware Institute is acceptable as indicating required experience.

4. All ULC-labelled doors and frames must have ULC rated finish hardware.

1.10. Delivery and Storage

1. Store finishing hardware in locked, clean and dry area.

2. Package each item of hardware including fastenings, separately or in like groups of hardware, label each package as to item definition and location.

2. PRODUCTS

2.1. Hardware Items

1. Use one manufacturer's products only for all similar items.

2. All exterior door and gate hardware shall have a stainless steel finish and corrosion resistant parts when exposed to weather.

2.2. Door Hardware

1. Locks and latches to CAN/CGSB-69.17, series 4000 bored lock, designed for function and keyed as stated in Hardware Schedule:

    1. Bored and preassembled locks and latches – Exterior Doors

        1. Acceptable Products: "D Series Rhodes lever" by Schlage; "10 Series L lever" by Sargent; "CL 3500 NZD lever" by Corbin; or pre-approved equivalent.

    2. Bored and preassembled locks and latches – Interior Public and Common Doors

        1. Acceptable Products: "D Series Rhodes lever" by Schlage; "10 Series L lever" by Sargent; "CL 3500 NZD lever" by Corbin; or pre-approved equivalent.

    3. Roses and Escutcheons: round or square, to match levers, knobs or combination sets as applicable.

    4. Normal strikes: box type, lip projection not beyond jamb, to match latches and deadbolts.

5. Electric strike:

    1. Basis of design product: “RCI 6 Series Centreline” by Dormakaba, or pre-approved equivalent.

6. Magnetic Locks:

    1. Basis of design product: “RCI 8 Series 8310/8320 MultiMag” by Dormakaba, or pre-approved equivalent.

7. Cylinders: 6 pin, key into keying system as noted, to match levers, knobs or combination sets as applicable.

8. Finish: 626 US26D (satin chromium), except where otherwise noted. Refer to Specification 08 11 16 - Aluminum Doors and Frames section 2.4. Aluminum Finishes for hardware finish.

2. Butts and hinges:

    1. Butts and hinges, general: to CAN/CGSB-69.18, designated by letter A and numeral identifiers, followed by size and finish, listed in Hardware Schedule.

        1. For all fire rated doors, provide ball bearing hinges with five knuckles and two sets of bearings. All exterior door hinges to have non-removable pins (NRP).

        2. Acceptable Products, Exterior: “BB 1191” by Hager; “BB 191” by Stanley; “TA 2314” by McKinney; or pre-approved equivalent.

        3. Acceptable Products, Interior: “BB 1279” by Hager; “BB 179” by Stanley; “TA 2714” by McKinney; or pre-approved equivalent.

        4. Non-Ferrous hinges shall be used on all exterior doors. Non removable pins (NRP) to be installed on doors that have hinge barrel exposed on exterior side.

        5. Suite Interior Door Hinges: 89 x 89 mm (3-1/2" x 3-1/2"), 2 GD finish, 3 pair.

3. Exit devices: to CAN/CGSB-69.19, grade 1, special (describe) design, finished to US26D.

    1. Acceptable Products: “Series 99 x 992L-06 trim” by Von Duprin; “8000 Series x ETL trim” by Sargent; “ED 5000 Series x Newport trim” by Corbin; or pre-approved equivalent.

    2. Auxiliary item(s): door co-ordinator, type 21, for pairs of doors with overlapping astragals.

4. Door Closers and Accessories:

    1. Door controls (closers): to CAN/CGSB-69.20, designated by letter C and numeral identifiers listed in Hardware Schedule, finish BHMA 689 (aluminium). All closers to meet barrier free requirements (ACA compliant) and to provide maximum degree of opening required.

        1. Acceptable Products: “1461 Standard or Designer Series” by LCN; “1431 Series” by Sargent; “8501 Series” by Norton; or pre-approved equivalent.

    2. Exterior Aluminum Doors

        1. Basis of design product: “2030 Series” by LCN, or pre-approved equivalent.

    3. Exterior Steel Framed Steel Doors

        1. Basis of design product: “4040 Designer Series” by LCN,; “351 Series” by Sargent; “7500 Series” by Norton; or pre-approved equivalent.

4. Interior Wood Doors

    1. Basis of design product: “3130 Series” by LCN, or pre-approved equivalent.

5. Door Coordinator: concealed for pairs of doors with overlapping astragal.

    1. Basis of design product: “COR Series” by LCN, or pre-approved equivalent.

5. Door Operators:

    1. Power-operated pedestrian doors: to CAN/CGSB-69.26.

    2. Power assist and low energy power operated doors: to CAN/CGSB-69.35.

6. Architectural door trim: to CAN/CGSB-69.22, as listed below.

    1. Door protection plates: kick plate, 1.6 mm thick stainless steel, 250 mm (10”) high, width to fit door stainless steel (32D) finish, secured with corrosion resistant screws.

        1. Acceptable Products: “8400 Protection Plate” by IVES, or pre-approved equivalent.

    2. Push plates: 1.6 mm thick stainless steel, 102 mm x 580 mm (4” x 20”), CFC – cut for cylinder or CFT – cut for thumb turn. Stainless steel C-32D finish

        1. Acceptable Products: “8200 Push Plates” by IVES, or pre-approved equivalent.

    3. Push/Pull units: 102 mm x 580 mm (4” x 20”), 305 mm (12”) “D” handle size.

        1. Acceptable Products: “8300 Door Pulls” by IVES, or pre-approved equivalent.

7. Sliding (pocket) door hardware: to CAN/CGSB-69.30 listed in Hardware Schedule.

    1. Pocket sliding door hardware: accessible sliding door latch and lock.

        1. Acceptable Products: “C-90L-CC” by KN Crowder, or pre-approved equivalent. Provide full manufacturer range of finishes for architect to review and approve.

    2. Pocket sliding door hardware: sliding hardware.

        1. Acceptable Products: “Type CC-6MS” Easy Connect Catch N Closer Hanger by KN Crowder and “CPD-2X6-Joiner kit” by KN Crowder as required or pre-approved equivalent.

        2. Door thickness and weight are to be reviewed by an Engineer licensed to practice in the Province of British Columbia. The Engineer is to seal and sign the applicable shop drawings for windows and guards. Submit Structural Schedule S-B prior to fabrication of this Work, and Structural Schedule S-C on completion of Work and prior to request for Substantial Performance of The Work.

    3. Pocket sliding door hardware: 1” back to back stainless steel D pulls.

        1. Acceptable Products: “CRT-GDP” by KN Crowder, or pre-approved equivalent.

        2. Provide full manufacturer range of finishes for architect to review and approve.

8. Auxiliary hardware: to CAN/CGSB-69.32, as listed below, finish US26D/BMHA626 (satin chromium), unless noted otherwise. Provide solid backing for door stops.

    1. Adjustable door stop and holder wall mounted:

        1. Acceptable Products: “495” by IVES, or pre-approved equivalent.

2. Adjustable door stop and holder floor mounted:

    1. Acceptable Products: “496”, or “497” by IVES, or pre-approved equivalent.

3. Dome stop, floor mounted:

    1. Acceptable Products: “FS436 Dome Stop” or “FS438 Dome Stop” by IVES, or pre-approved equivalent.

4. Knob bumpers, wall mounted (flush knob):

    1. Acceptable Products: “WS401”, “WS402”, “WS406”, “WS407”, “WS408” by IVES, or pre-approved equivalent.

5. Knob bumpers, wall mounted (protruding knob):

    1. Acceptable Products: “WS401-1/2”, “WS402-1/2”, “WS406-1/2”, “WS407-1/2”, “WS408-1/2” by IVES, or pre-approved equivalent.

6. Bumpers, wall mounted:

    1. Acceptable Products: “WS443” or “WS447” by IVES, or pre-approved equivalent.

7. Bumpers and manual holders, wall mounted:

    1. Acceptable Products: “WS445” or “WS449” by IVES, or pre-approved equivalent.

8. Holders, wall mounted:

    1. Acceptable Products: “WS40” or “WS45” by IVES, or pre-approved equivalent.

9. Bumpers, floor mounted:

    1. Acceptable Products: “WS444” or “WS448” by IVES, or pre-approved equivalent.

10. Bumpers and manual holders, floor mounted:

    1. Acceptable Products: “WS446” or “WS450” by IVES, or pre-approved equivalent.

11. Roller bumpers and manual holders, wall mounted:

    1. Acceptable Products: “RB470” by IVES, or pre-approved equivalent.

12. Kick down holder, door mounted:

    1. Acceptable Products: “FS452” by IVES, or pre-approved equivalent.

13. Chain stops:

    1. Acceptable Products: “Crash Stops” by IVES, or pre-approved equivalent.

14. Automatic flush bolts (metal doors):

    1. Acceptable Products: “FB30 Series” by IVES, or pre-approved equivalent.

15. Automatic flush bolts (wood doors):

    1. Acceptable Products: “FB40 Series” by IVES, or pre-approved equivalent.

9. Door bottom seal: heavy duty, door seal of extruded aluminum frame and solid or hollow closed cell neoprene weather seal, recessed in door bottom, closed ends; automatic retract mechanism when door is open as indicated in door schedule; clear anodized finish.

10. Thresholds: width of door frame x full width of door opening, extruded aluminum or stainless steel mill finish, plain surface, with thermal break of rigid PVC, with lip and vinyl door seal insert. Thresholds to have no more than a 13 mm (1/2") floor offset.

    1. Acceptable Products: Pemko barrier free; or pre-approved equivalent.

11. Weather-stripping:

    1. Heavy duty bulb type extruded closed cell sponge neoprene clear anodized finish weatherstrips (not foam type). Weather stripping must restrict air infiltration to not more than 0.05 m^3 (1.76 ft^3) per minute per 1.0 m (3'-4") of joint.

    2. For residential doors, insert rabbit style door weatherstripping. It should have a nylon cover to prevent sticking to the slab in frosty conditions.

    3. For out-swinging doors, insert door top and use overhead rain drip cap where door will be subjected to severe weather conditions. For interior doors use self adhesive for smoke/ sound seal.

    4. Head and jamb seal:

        1. Extruded aluminum frame and solid or hollow closed cell neoprene or vinyl insert, clear anodized finish.

        2. Adhesive backed neoprene or vinyl covered foam material.

        3. Acceptable Products: Heavy Duty by Draftseal or Pemko.

    5. Door bottom seal:

        1. Extruded aluminum frame and solid or hollow closed cell neoprene or vinyl insert, clear anodized finish.

        2. Acceptable Products: Heavy Duty by Draftseal or Pemko

12. Astragal: all exterior doors should be equipped with heavy gauge steel 2-piece interlocking astragals for additional security.

13. Door Labels: hardware used in fire rated openings must bear ULC label.

2.3. Fastenings

1. Supply screws, bolts, expansion shields and other fastening devices required for satisfactory installation and operation of hardware.

2. Exposed fastening devices to match finish of hardware.

3. Where pull is scheduled on one side of door and push plate on other side, supply fastening devices, and install so pull can be secured through door from reverse side. Install push plate to cover fasteners.

4. Use fasteners compatible with material through which they pass.

2.4. Keying

1. Doors, padlocks and cabinet locks to be keyed as prescribed by the Owner. Prepare detailed keying schedule in conjunction with Owner.

    1. All locks to be supplied with a 6 in factory generated master key system. Keying to be determined in consultation with the Owner.

    2. All locks to be operated on one common master key.

3. Allow for factory construction keying of all locks.

4. Allow for two keys per lock.

5. All keys to be stamped “Do Not Duplicate”.

2. Deliver tagged and indexed keys and key cylinders directly to Owner and obtain a signed receipt from Owner’s authorized receiver.

3. EXECUTION

3.1. Installation Instructions

1. Furnish metal door and frame manufacturers with complete instructions and templates for preparation of their work to receive hardware.

2. Furnish manufacturers’ instructions for proper installation of each hardware component.

3. Where doorstop contacts door pulls, mount stop to strike bottom of pull.

4. Remove construction when directed by Consultant; install permanent cores and check operation of all locks.

5. Install hardware to standard hardware location dimensions in accordance with the Door & Hardware Institute Guide.

6. Coordinate with Electrical Sub-Contractor to provide disconnect switch located near door opening, conduit and connection of wiring to motor and connecting wiring into operator.

3.2. Schedule

1. Lever handles are required on all lock and latch sets accessible to tenants.

2. Suite entry are to be locked and operated with a key only from the outside.

3. Refer to door schedules on drawings.

3.3. Adjustment and Inspection

1. After installation adjust hardware to manufacturer's instructions. Ensure all hardware is in proper working order.

2. The individual responsible for scheduling, detailing, ordering and coordinating hardware for this project shall inspect the installed hardware, and certify that it conforms to the requirements of this Section, and has been properly installed, after installation is complete.

3.4. Clean-up

1. Promptly as the work proceeds and on completion remove from the job-site all packaging materials and waste materials resulting from the work of this Section.

END OF SECTION

1. GENERAL

1.1. Summary

1. Refer to architectural drawings in conjunction with the specification.

1.2. Section Includes

1. Provide all labour, materials, tools and other equipment, services and supervision for the complete fabrication, supply, finishing and installation of all glazing as indicated on the drawings and as specified herein.

1.3. Related Sections

1. 07 92 10 - Joint Sealing
2. 08 11 14 - Metal Doors and Frames
3. 08 11 16 - Aluminum Doors and Frames
4. 08 53 13 - Vinyl Windows

1.4. Performance Requirements

1. Provide continuity of building enclosure vapour and air barrier using glass and glazing materials as follow:
    1. Utilize inner light of multiple light sealed units for continuity of air and vapour seal.
2. Limit glass deflection to 1/200 or flexural limit of glass with full recovery of glazing materials.

1.5. Closeout Submittals

1. Provide maintenance data including cleaning instructions for incorporation into manual specified in Section 01 78 00 – Closeout Submittals.

1.6. Shop Drawings

1. Submit shop drawings in accordance with Section 01 33 00 – Submittal Procedures.
2. All glazing thicknesses are to be reviewed by an Engineer licensed to practice in the Province of British Columbia. The glazing Engineer is to seal and sign the applicable shop drawings for windows and guards. Submit Structural Schedule S-B prior to fabrication of this Work, and Structural Schedule S-C on completion of Work and prior to request for Substantial Performance of The Work.

1.7. Quality Assurance

1. Perform work in accordance with FGMA Glazing Manual, IGMAC and Laminators Safety Glass Association - Standards Manual for glazing installation methods.

1.8. Environmental Requirements

1. Install glazing when ambient temperature is 10°C (50°F) minimum. Maintain ventilated environment for 24 hours after application.
2. Maintain minimum ambient temperature before, during and 24 hours after installation of glazing compounds.

2. PRODUCTS

2.1. Materials: Flat Glass

1. Float glass (GL 1): to CAN/CGSB-12.3, transparent, 4 mm thick.
2. Tempered Glass (GL 2): to CAN/CGSB-12.1, transparent, 4 mm minimum thickness.
    1. Type: 2 - tempered.
    2. Class: B - float.
    3. Category: II - 540 J Impact Resistance.
        1. Basis of Design Cardinal Glass Industries CT
3. Laminated Glass: to CAN/CGSB-12.1, transparent
    1. Type: 1 - laminated; 2 sheets of tempered clear glass (GL 2) with minimum 0.76 mm fully bonded high impact UV resistant clear polyvinyl butyral (PBV) interlayer.
4. Silvered mirror glass: to CAN/CGSB-12.5, 4 mm thick.
    1. Type: 1B - Float glass for high humidity use.
5. Low emissivity (LOW E) glass:
    1. Metallic coating: soft, sputtered.
    2. Basis of design product: “366” by Cardinal Glass, or pre-approved equivalent.

2.2. Materials: Sealed Insulating Glass

1. Insulating glass units (SIG-1): to CAN/CGSB-12.8, double unit.
    1. Glass: to CAN/CGSB-12.3 or CAN/CGSB-12.1 as required by code.
    2. Glass thickness: as required by trade contractor’s engineer.
    3. Inter-cavity space thickness: 15 mm.
    4. Inter-cavity gas: argon.
    5. Spacer: to provide continuous vapour barrier between interior of sealed unit and secondary seal; warm edge spacer, black.
    6. Light transmittance: 0.65.
    7. Solar heat gain co-efficient (SHGC):) 0.27 for glass.
    8. U-Value: 1.36 W/m^2K
    9. Glass coating (low-E): surface number 2.
    10. Basis of design product: Cardinal Glass Industries Low “366”

2.3. Accessories

1. Sealant: refer to Section 07 92 10 - Joint Sealing.
2. Setting blocks: Neoprene or EPDM or Silicone, 80 - 90 Shore A durometer hardness to ASTM D2240, length of 25 mm for each square meter of glazing.

3. Spacer shims: Neoprene or Silicone, 50 - 60 Shore A durometer hardness to ASTM D2240, 75 mm long x one half height of glazing stop x thickness to suit application. Self adhesive on one face.

4. Glazing tape:

    1. Preformed butyl compound with integral resilient tube spacing device, 10 - 15 Shore A durometer hardness to ASTM D2240; coiled on release paper; black colour.

    2. Closed cell polyvinyl chloride foam, coiled on release paper over adhesive on two sides, maximum water absorption by volume 2%, designed for compression of 25%, to effect an air and vapour seal.

5. Glazing splines: resilient polyvinyl chloride silicone, extruded shape to suit glazing channel retaining slot, black colour.

6. Glazing clips: manufacturer's standard type.

7. Glazing gaskets: extruded EPDM rubber.

8. Lock-strip gaskets: to ASTM C542.

9. Mirror attachment accessories:

    1. Stainless steel clips.

3. EXECUTION

3.1. Examination

1. Verify that openings for glazing are correctly sized and within tolerance.

2. Verify that surfaces of glazing channels or recesses are clean, free of obstructions, and ready to receive glazing.

3.2. Preparation

1. Clean contact surfaces with solvent and wipe dry.

2. Seal porous glazing channels or recesses with substrate compatible primer or sealer.

3. Prime surfaces scheduled to receive sealant.

3.3. Installation: Exterior – Dry Method (Preformed Glazing)

1. Cut glazing tape to length; install on glazing light. Seal corners by butting tape and sealing junctions with sealant.

2. Place setting blocks at 1/4 points, with edge block maximum 150 mm (6") from corners.

3. Rest glazing on setting blocks and push against fixed stop with sufficient pressure to attain full contact.

4. Install removable stops without displacing glazing tape. Exert pressure for full continuous contact.

5. Trim protruding tape edge.

3.4. Installation: Mirrors

1. Set mirrors with adhesive, applied in accordance with adhesive manufacturer's instructions.

2. Set mirrors with clips. Anchor rigidly to wall construction.

3. Set in frame.

4. Place plumb and level.

3.5. Cleaning

1. Remove glazing materials from finish surfaces.
2. Remove labels after work is complete.
3. Clean glass and mirrors.

3.6. Protection of Finished Work

1. After installation, mark light with an “X” by using removable plastic tape or paste. Do not mark heat absorbing or reflective glass units.

END OF SECTION

1. GENERAL

1.1. SUMMARY

1. Refer to architectural drawings in conjunction with the specification.

1.2. Section Includes

1. The supply and installation of gypsum board, complete with all corner beads, J-moulds and other trim accessories, installation of tape and filler, all sanding and finishing of gypsum board surfaces as indicated in the drawings, including the returns at jambs and heads of all windows. Also, the installation of acoustical sealant and silicone sealant as described in Section 07 92 10 – Joint Sealing.

2. The supply and installation of gypsum board as per BCBC over bathroom fans; refer to Mechanical for locations.

3. The supply and installation of moisture-resistant gypsum board behind all plumbing.

1.3. Product Handling

1. Deliver and store material undamaged in original wrapping or containers, with manufacturer's labels intact.

2. Prevent damage to materials during handling and storage. Keep gypsum board and cementitious materials under cover and free from dampness.

1.4. Site Environmental Requirements

1. Ensure temperature and ventilation conditions are maintained as required under Section 9.6 - Part 3, Item 2 of AWCC Standards.

2. Protect work of other sections from damage resulting from work of this section. Take necessary protection to avoid spattering of surfaces adjacent to gypsum board areas, particularly aluminum and glass. Promptly remove gypsum droppings.

3. Examine the underlying surfaces and adjoining work and report defects that might impair the gypsum board to the Architect in writing.

4. Apply board and joint treatment to dry, frost free surfaces.

1.5. Quality Assurance

1. AWCC of BC Standards Manual, together with authorized additions and amendments, shall be used as a reference standard and shall form part of this project specification.

2. Where modifications to the standards contained within the AWCC Standards Manual are included in this project specification, then such modifications shall govern in case of conflict.

3. The installer of gypsum board shall keep a copy of the AWCC Standards Manual available at the project site for reference purposes.

4. Gypsum board products to be used in the project to meet or exceed the requirements specified under Part 2 - Products, of Section 9.6 of the AWCC Standards Manual. Provide the Architect, if requested, with satisfactory evidence in the AWCC Standards Manual. The Architect will reject any product failing to meet those requirements.

5. Reference in these project specifications to Section numbers, Parts and Item numbers means those Section, Parts, and Items contained within Section 9.6 of the AWCC Specification.

2. PRODUCTS

2.1. Materials

1. Gypsum Panels
    1. Standard board: to ASTM C1936/C1938M, 12.7 mm (1/2") and 15.9 mm (5/8") thick, dimensions 1.219m (48") x maximum practical length to minimize joints.
    2. Fire-resistant board: fire-resistant Type X having ULC label and/or Type C to ASTM C1396/C1396M, 12.7 mm (1/2") and 15.9 mm (5/8") thick; dimensions 1.219m (48") x maximum practical length to minimize joints.
    3. Mould and Moisture Resistant Gypsum Board: to ASTM C1658, 12.7 mm (1/2") and 15.9 mm (5/8") thick Type X, coated inorganic fiberglass mat facer front and back with enhanced moisture and mould resistance core. Score 10 for mould resistance as per ASTM D3273; dimensions 1.219m (48") x maximum practical length to minimize joints. To be used in wet rooms: washrooms, kitchens, janitor room and as noted on assemblies.
2. Supports
    1. Metal furring runners, hangers, tie wires, inserts, anchors.
    2. Gypsum board furring channels: to AWCC Section 9.6 - Part 2, Item 4.1; 25 gauge core thickness galvanized steel channels for screw attachment of gypsum board.
    3. Resilient channel: AWCC Section 9.6 - Part 2, Item 4.2; Z-shape, 25 gauge base steel thickness galvanized steel for resilient attachment of gypsum board.
3. Fasteners
    1. Nails: to ASTM C 514.
    2. Steel drill screws: to ASTM C 1002 and AWCC Section 9.6 - Part 2, Item 2.1.1.
    3. Stud adhesive: to CAN/CGSB-71.25 and AWCC Section 9.6 - Part 2, Item 2.3.
    4. Wallboard adhesive: to AWCC Section 9.6 - Part 2, Item 2.4.
4. Fillers and Sealants
    1. Water: fresh, clean, potable, free from deleterious matter or alkalis.
    2. Joint compound: to ASTM C 475 and AWCC Section 9.6 - Part 2, Item 2.2, asbestos-free.
    3. Laminating compound: as recommended by manufacturer, asbestos-free.
    4. Sealants: acoustical sealant and silicone sealant in accordance with Section 079210 – Joint Sealing.
5. Accessories
    1. Casing beads, corner beads, J-mould, zip-strip, control joints and edge trim: to ASTM C 1047 and AWCC Section 9.6 - Part 2, Items 3.1 and 3.2, PVC, 0.5 mm base thickness, perforated flanges, one piece length per location. Corner beads to be tape on type with abrasion resistant finish.
    2. Tear Away beads to be used for all edging (1/2” and 5/8” beads).
    3. Resilient Sound Isolation Clips as shown on assemblies.

2.2. Finishes

1. Texture finish: not used on this project.

3. EXECUTION

3.1. Erection

1. Do application and finishing of gypsum board in accordance with ASTM C 840 and AWCC Section 9.6, Part 3, except where specified otherwise.
2. Do application of gypsum sheathing in accordance with ASTM C 1280 and AWCC Section 9.6, Part 3.
3. Erect hangers and runner channels for suspended gypsum board ceilings in accordance with ASTM C 840 except where specified otherwise.
4. Support light fixtures by providing additional ceiling suspension hangers within 150 mm (6”) of each corner and at maximum 600 mm (2’-0”) around perimeter of fixture.
5. Install work level to tolerance of 1:1 200.
6. Frame with furring channels, perimeter of openings for access panels, light fixtures, diffusers, grilles.
7. Install 19 x 64 mm (3/4” x 2-1/2”) furring channels parallel to, and at exact locations of steel stud partition header track.
8. Furr for gypsum board faced vertical bulkheads within and at termination of ceilings.
9. Furr above suspended ceilings for gypsum board fire and sound stops and to form plenum areas as indicated.
10. Install wall furring for gypsum board wall finishes in accordance with ASTM C 840 and AWCC Section 9.6 - Part 3, Item 6, except where specified otherwise.
11. Furr openings and around built-in equipment, cabinets, access panels, on four sides. Extend furring into reveals. Check clearances with equipment suppliers.
12. Furr duct shafts, beams, columns, pipes and exposed services where indicated.
13. Erect resilient furring in accordance with AWCC Section 9.6 - Part 3, Item 10, transversely across studs and joists or between the layers of gypsum board as shown in drawings, spaced maximum 600 mm (2’-0”) o/c and not more than 150 mm (6”) from ceiling/wall juncture. Secure to each support with 25 mm (1”) drywall screw.
14. Install 150 mm (6”) continuous strip of 12.7 mm (1/2”) gypsum board along base of partitions where resilient furring installed.
15. Do not close in ceiling and soffit spaces or walls until all services have been completed, tested and approved.
16. Seal underside of wood stud plates with acoustical sealant in accordance with Section 079210 Joint Sealing, and as required by the Specifications for rated assemblies. Seal around penetrations in sound-rated walls including joints between dissimilar construction.

3.2. Application

1. Do not apply gypsum board until bucks, anchors, blocking, electrical and mechanical work are approved. Apply gypsum board in accordance with AWCC Section 9.6 - Part 3, Item 3.

2. Apply single or double layer gypsum board as indicated to wood or metal furring or framing as indicated, using screw fasteners and screw fasteners for second layer, and according to AWCC Section 9.6 - Part 3, Items 6 and 7.5. Maximum spacing of screws 300 mm (1'-0") o/c, unless indicated otherwise in ULC design for specific wall assemblies, or in AWCC Section 9.6, Part 3.

3. Apply water-resistant gypsum board in accordance with AWCC Section 9.6 - Part 3, Item 8, where adjacent to slop sinks, janitors closets, and other sources of moisture. Apply water-resistant sealant to edges, ends, cut-outs which expose gypsum core and to fastener heads. Do not apply joint treatment on areas to receive tile finish. Install the boards so that the correct surface is facing into the room; secure with adhesives and screws in accordance with the referenced standards. Ensure that all joints are closely fitted.

4. Apply 12 mm (1/2") diameter bead of acoustic sealant continuously around periphery of each face of partitioning to seal gypsum board/structure junction where partitions abut fixed building components. Seal full perimeter of cut-outs around electrical boxes, ducts, in partitions where perimeter sealed with acoustic sealant.

5. Arrange vinyl-faced gypsum board symmetrical about openings and wall areas, with butt joints or aluminum/vinyl mouldings between joints.

6.

3.3. Installation

1. General

    1. Erect accessories straight, plumb or level, rigid and at proper plane. Use full-length pieces where practical. Make joints tight, accurately aligned and rigidly secured. Mitre and fit corners accurately, free from rough edges. Secure at 150 mm (6") o/c using contact adhesive for full length.

2. Casing Beads, Insulating Strips and Shadow Mould

    1. Install casing beads to all openings and at junction with dissimilar materials in accordance with AWCC Section 9.6 - Part 3, Item 11.2.

    2. Install casing beads around perimeter of suspended ceilings.

    3. Install casing beads where gypsum board butts against surfaces having no trim, concealing junction and where indicated. Seal joints with sealant.

    4. Install insulating strips continuously at edges of gypsum board and casing beads abutting metal window and exterior door frames, to provide thermal break.

    5. Install shadow mould at gypsum board/ceiling juncture as indicated. Minimize joints; use corner pieces and splicers.

3. Control Joints and Expansion Joints

    1. Construct control joints of preformed units set in gypsum board facing and supported independently on both sides of joint.

    2. Provide continuous polyethylene dust barrier behind and across control joints.

    3. Locate control joints where indicated.

    4. Install control joints straight and true.

    5. Construct expansion joints as detailed, at building expansion and construction joints. Provide continuous dust barrier.

    6. Install expansion joint straight and true.

4. Cornice Cap

    1. Install cornice cap where gypsum board partitions do not extend to ceiling.

    2. Fit cornice cap over partition, secure to partition track with two rows of sheet metal screws staggered at 300 mm (1'-0") o/c.

    3. Splice corners and intersections together and secure to each member with three (3) screws.

5. Fixtures

    1. Cut and fit gypsum board to accommodate recessed items in partitions and/or furring including, but not necessarily limited to, mechanical and electrical equipment, electrical cabinets, fire hose cabinets, electrical receptacles, access doors and other recessed fixtures as indicated or required.

    2. Rigidly secure frames to furring or framing systems.

6. Face Joints and Corner Beads

    1. Install corner beads on all external angles in accordance with AWCC Section 9.6 - Part 3, Item 11.1

    2. Finish face panel joints and internal angles with joint system consisting of joint compound, joint tape and taping compound installed according to manufacturer's directions and feathered out onto panel faces.

    3. Finish corner beads, control joints and trim as required with two coats of joint compound and one coat of taping compound, feathered out onto panel faces.

7. Filling and Taping

    1. Fill screw head depressions with joint and taping compounds to bring flush with adjacent surface of gypsum board so as to be invisible after surface finish is completed.

    2. Sand lightly to remove burred edges and other imperfections. Avoid sanding adjacent surface of board.

    3. Completed installation to be smooth, level or plumb, free from waves and other defects and ready for surface finish.

    4. Apply one coat of white primer sealer over surface to be textured. When dry apply textured finish in accordance with manufacturer's instructions.

    5. Mix joint compound slightly thinner than for joint taping.

    6. Apply thin coat to entire surface using trowel or drywall broad-knife to fill surface texture differences, variations or tool marks.

    7. Allow skim coat to dry completely.

    8. Remove ridges by light sanding or wiping with damp cloth.

3.4. Schedules

1. Finish gypsum board surfaces in accordance with Levels of Finish as prescribed in Section 9.6 of the AWCC Manual, and as follows:
    1. Level 1 Finish: areas where the assembly will be completely concealed from view such as in roof spaces and behind solid wall and ceiling finishes.
    2. Level 2 Finish: mechanical and electrical rooms.
    3. Level 4 Finish: areas that will receive a flat or eggshell paint finish.

3.5. Cleanup

1. Promptly as the work proceeds and on completion, clean up all excess and waste material resulting from gypsum wallboard operations, and remove from the site.

END OF SECTION

1. GENERAL

1.1. Summary

1. Refer to architectural drawings in conjunction with the specification.

1.2. Section Includes

1. Provide all labour, materials, tools and other equipment, services and supervision necessary for the supply and installation of acoustical suspension systems and accessories as indicated on the drawings and as specified herein.

1.3. Design Requirements

1. Maximum deflection: 1/360th of span to ASTM C635 deflection test.

1.4. Shop Drawings

1. Submit shop drawing in accordance with Section 01 33 00 – Submittal Procedures.
2. Submit reflected ceiling plans for special grid patterns as indicated.
3. Indicate lay-out, insert and hanger spacing and fastening details, splicing method for main and cross runners, location of access splines, change in level details, access door dimensions, and locations and acoustical unit support at ceiling fixture, lateral bracing and accessories.

1.5. Samples

1. Submit samples in accordance with Section 01 33 00 – Submittal Procedures.
2. Submit one representative model of each type ceiling suspension system.
3. Ceiling system to show basic construction and assembly, treatment at walls, recessed fixtures, splicing, interlocking, finishes, acoustical unit installation.

1.6. Regulatory Requirements

1. Fire-resistance rated suspension system: certified by a Canadian Certification Organization accredited by Standards Council of Canada.

2. PRODUCTS

2.1. Materials

1. To ASTM C635.
2. Basic materials for suspension system: commercial quality cold rolled steel, zinc coated.
3. Suspension system: non fire rated, made up as follows:
    1. Two directional exposed tee bar grid, standard profile:
        1. Basis of design product: “Prelude XL 15/16 Exposed Tee” by Armstrong; or pre-approved equivalent.
4. Exposed tee bar grid components: shop painted satin sheen, white.
5. Hanger wire: galvanized soft annealed steel wire.
    1. 3.6 mm (8 gauge) diameter for access tile ceilings.
6. Hanger inserts: purpose made.

7. Accessories: splices, clips, wire ties, retainers and wall moulding flush, to complement suspension system components, as recommended by system manufacturer.

3. EXECUTION

3.1. Installation

1. Installation: in accordance with ASTM C636 except where specified otherwise.
2. Install suspension system to manufacturer's instructions (and Certification Organizations tested design requirements).
3. Do not erect ceiling suspension system until work above ceiling has been inspected by Consultant.
4. Secure hangers to overhead structure using attachment methods acceptable to Engineer.
5. Install hangers spaced at maximum 1200 mm (4'-0") centres and within 150 mm (6") from ends of main tees.
6. Lay out center line of ceiling both ways, to provide balanced borders at room perimeter with border units not less than 50% of standard unit width system according to reflected ceiling plan.
7. Ensure suspension system is co-ordinated with location of related components.
8. Install wall moulding to provide correct ceiling height.
9. Completed suspension system to support super-imposed loads, such as lighting fixtures, diffusers, grilles and speakers.
10. Support at light fixtures and diffusers with additional ceiling suspension hangers within 150 mm (6") of each corner and at maximum 600 mm (2'-0") around perimeter of fixture.
11. Attach cross member to main runner to provide rigid assembly.
12. Frame at openings for light fixtures, air diffusers, speakers and at changes in ceiling heights.
13. Finished ceiling system to be square with adjoining walls and level within 1:1000.

3.2. Cleaning

1. Touch up scratches, abrasions, voids and other defects in painted surfaces.

3.3. Cleanup

1. Promptly as the work proceeds and on completion, clean up all excess and waste material resulting from work of this section, and remove from the site.

END OF SECTION

1. GENERAL

1.1. Summary

1. Refer to architectural drawings in conjunction with the specification.

1.2. Section Includes

1. Provide all labour, materials, tools and other equipment, services and supervision required for the installation of resilient sheet flooring and accessories where indicated on the drawings and as specified herein.

1.3. Related Sections

1. 03 30 00 - Cast-in-place Concrete
2. 06 10 10 - Rough Carpentry

1.4. Samples

1. Submit samples in accordance with Section 01 33 00 – Submittal Procedures.
2. Submit 300 x 300 mm (1’-0” x 1’-0”) sample pieces of sheet material, 300 mm (1’-0”) long base, nosing, feature strips, treads, edge strips.
3. Submit drawing showing seam layout to Consultant for review prior to installation.

1.5. Closeout Submittals

1. Provide maintenance data for resilient flooring for incorporation into manual specified in Section 01 78 00 – Closeout Submittals.

1.6. Extra Materials

1. Provide extra materials of resilient sheet flooring and adhesives in accordance with Section 01 78 00 – Closeout Submittals.
2. Provide 10 m^2 (100 $ft.^2$) or 5% (whichever is greater) of each colour, pattern and type flooring material required for project for maintenance use.
3. Extra materials to be in one piece and from same production run as installed materials.
4. Clearly identify each roll of sheet flooring and each container of adhesive.
5. Deliver to Owner, upon completion of the work of this section.
6. Store where directed by Consultant or Owner.

1.7. Environmental Requirements

1. Maintain air temperature and structural base temperature at flooring installation area above 20°C (68°F) for 48 hours before, during and 48 hours after installation.

1.8. Delivery, Storage and Handling

1. Label packaged materials.
2. Store packaged materials in original containers or wrapping with manufacturer’s seals and labels intact.
3. Store resilient flooring and accessories in location as directed by Consultant.

4. Prevent damage to materials during handling and storage. Keep materials under cover and free from dampness.

5. Maintain temperature of store room at a minimum of 20°C (68°F), for at least 24 hours immediately before the installation.

1.9. Waste Management and Disposal

1. Separate and recycle waste materials in accordance with Section 01 74 19 – Construction Waste Management and Disposal and the Waste Reduction Workplan, and the Waste Management plan to the maximum extent economically possible.

2. Set aside and protect surplus and uncontaminated waste finish materials. Deliver to, or arrange collection by employees, individuals, or organizations for verifiable re-use or re-manufacturing.

3. Separate and recycle off cuts and waste materials in accordance with the Waste Management Plan and to the maximum extent economically feasible.

4. Place materials defined as hazardous or toxic waste in designated containers.

5. Return solvent and oil soaked rags, used during installation, for contaminant recovery, or laundering or for proper disposal.

6. Use trigger operated spray nozzles for water hoses.

7. Close and seal tightly all partly used sealant and adhesive containers and store protected in well ventilated fire-safe area at moderate temperature.

8. Place used sealant and adhesive tubes and containers in areas designated for hazardous waste.

2. PRODUCTS

2.1. Materials

1. Resilient flooring to ASTM F1303, commercial; All seams to be heat welded with matching welding rods.

2. Slip-resistant homogeneous sheet vinyl – kitchen **(RSF-1)**

    1. Thickness: 2.0 mm.

    2. Acceptable product: “Blizzard VM12055” by Altro Walkway 20 | Slip resistant Flooring

3. Sheet Metal Base (only if required)

    1. Type: rubber.

    2. Style: cove.

    3. Thickness: 2.36 mm.

    4. Height: 102 mm.

    5. Lengths: cut lengths minimum 2400 mm.

    6. Colour finish:

        1. RB-1: “32 Pebble” (storage and service rooms)

    7. Acceptable products:

        1. Traditional Rubber Wall Base by Tarkett.

8. Flash cove base (FC-1)

9. To match resilient sheet flooring as specified in the drawings.

10. Height: 140 mm

4. Primers and adhesives: waterproof, of types recommended by resilient flooring manufacturer for specific material on applicable substrate, above, on or below grade.

5. Flash cove former: “CF 20” by Polyflor.

6. Sub-floor filler and leveller: as recommended by flooring manufacturer for use with their product.

7. Metal edge strips: polished stainless steel with lip to extend under floor finish, shoulder flush with top of adjacent floor finish.

8. External corner protectors: stainless steel, type recommended by flooring manufacturer.

9. Edging to floor penetrations: stainless steel, type recommended by flooring manufacturer.

10. Sealer and wax: type recommended by resilient flooring material manufacturer for material type and location.

3. EXECUTION

3.1. Inspection

1. Ensure concrete floors are clean and dry by using test methods recommended by flooring manufacturer.

2. Prior to installation, the Contractor, flooring installer, flooring manufacturer’s representative, and Consultant shall meet on site to establish procedures for inspections, approval of product samples, patterns, colours and accessories, procedures for the acceptability of the substrate, environmental conditions, installation procedures, and protection of the finished work.

3.2. Preparation

1. Remove sub-floor ridges and bumps. Fill low spots, cracks, joints, holes and other defects with sub-floor filler.

2. Clean floor and apply filler; trowel and float to leave smooth, flat hard surface. Prohibit traffic until filler cured and dry.

3. Old vinyl flooring to be removed only by trained personnel (may contain asbestos).

4. Remove or treat old adhesives to prevent residual, old flooring adhesives from bleeding through to new flooring and/or interfering with the bonding of new adhesives.

5. Prime or seal concrete slab to resilient flooring manufacturer’s printed instructions.

3.3. Flooring Application

1. Provide a high ventilation rate, with maximum outside air, during installation, and for 48 to 72 hours after installation. If possible, vent directly to the outside. Do not let contaminated air recirculate through a district or whole building air distribution system. Maintain extra ventilation for at least one month following building occupation.

2. To minimize emissions from adhesives, use water-based, solvent-free styrene-butadiene-rubber adhesive for linoleum. Butadiene exposure may cause eye and nose irritation, headaches, dizziness, and vomiting.

3. Apply adhesive uniformly using recommended trowel. Do not spread more adhesive than can be covered by flooring before initial set takes place.

4. Lay flooring with seams parallel to building lines with grain direction as indicated on flooring plan to produce a minimum number of seams. Avoid seams in bathrooms. Seams in kitchens are only permitted under fridges and ranges, or in closets. Border widths as indicated on flooring plan.

5. Double cut sheet joints and continuously seal or heat weld according to manufacturer's printed instructions.

6. As installation progresses, and after installation roll flooring with 45 kg minimum roller (or as directed by manufacturer to ensure full adhesion.

7. Cut flooring neatly around fixed objects.

8. Install feature strips and floor markings where indicated. Fit joints tightly.

9. Install flooring in pan type floor access covers. Maintain floor pattern.

10. Continue flooring over areas that will be under built-in furniture.

11. Install flooring wall to wall before the installation of floor-set cabinets, casework, equipment, moveable partitions, etc. except where flash coving is indicated - in these cases install flash cove into millwork kicks. Extend flooring into toe spaces, door recesses, closets and similar opening shown on the drawings.

12. Terminate flooring at centreline of door in openings where adjacent floor finish or colour is dissimilar.

13. Install metal edge strips at unprotected or exposed edges where flooring terminates.

14. Floor drains should be provided with a clamping system that will ensure positive water flow, and a watertight flooring installation. Depression of the drain in the concrete floor or subfloor may be required to achieve a positive water flow.

3.4. Base Application

1. Lay out base to keep number of joints at minimum.

2. Clean substrate and prime with one coat of adhesive.

3. Apply adhesive to back of base.

4. Set base against wall and floor surfaces tightly by using 3 kg hand roller.

5. Install straight and level to variation of 1:1000.

6. Scribe and fit to door frames and other obstructions. Use premoulded end pieces at flush door frames.

7. Cope internal corners. Use premoulded corner units for right angle external corners. Use formed straight base material for external corners of other angles.

8. Heat weld base in accordance with manufacturer's printed instructions.

3.5. Cleaning

1. Remove excess adhesive from floor, base and wall surfaces without damage.

2. Clean, seal and wax floor and base surface to flooring manufacturer's printed instructions.

3.6. Protection

1. Protect new floors from time of final set of adhesive until final inspection.

2. Prohibit traffic on floor for 48 hours after installation.

3. Use only water-based coating for linoleum.

3.7. Schedules

1. Refer to drawings.

3.8. Clean-up

1. Promptly as the work proceeds and on completion, clean up and remove from the job-site all rubbish, used containers and surplus materials resulting from the work of this section.

END OF SECTION

1. GENERAL

1.1. Summary

1. Refer to architectural drawings in conjunction with the specification.

1.2. Section Includes

1. All labour, materials, tools and other equipment, services and supervision required to complete all interior and exterior (including above roof) painting and decorating work as indicated on Finish Schedules and to the full extent of the drawings and specifications.

2. Surface preparation to receive painting and finishing is not included under this section of work, except for priming and back-priming and specific pre-treatments noted herein or specified in the Master Painters Institute (MPI) Painting Specification Manual or Master Painters Institute (MPI) Maintenance and Repainting Manual.

3. Refer to drawings and Finish Schedules for type, location and extent of finishes required, and include all touch-ups and field painting necessary to complete work shown, scheduled or specified.

1.3. Related Sections

1. 03 30 00 - Cast-in-place Concrete

2. 05 50 00 - Metal Fabrications

3. 07 62 00 - Sheet Metal Flashing and Trim

4. 08 11 14 - Metal Doors and Frames

5. 09 21 16 - Gypsum Board Assemblies

6. 07 45 13 - Fibre Reinforced Cementitious Siding

7. 07 46 23 - Wood Siding

8. Division 23 - Heating, Ventilation, and Air Conditioning: grilles and diffusers

1.4. Quality Assurance

1. This Contractor shall have a minimum of five (5) years proven satisfactory experience and shall show proof before commencement of work that he will maintain a qualified crew of painters throughout the duration of the work. When requested, Contractor shall provide a list of the last three comparable jobs including, name and location, specifying authority/project manager, start and completion dates and cost amount of the painting work.

2. Only qualified journeymen who have a “Tradesman Qualification Certificate of Proficiency” shall be engaged in painting and decorating work. Apprentices may be employed provided they work under the direct supervision of a qualified journeyman in accordance with trade regulations.

3. Conform to the standards contained in the Master Painters Institute Architectural Painting Specification Manual, latest edition (hereafter referred to as MPI Painting Specification Manual) for all painting products including preparation and application of materials.

4. All paint manufacturers and products used shall be as listed under the “Approved Products” section of the MPI Architectural Painting Specification Manual.

5. Retain purchase orders, invoices and other documents to prove that all materials utilized in the Work meet requirements of the specifications. Produce documents when requested by Consultant.

1.5. Environmental Requirements

1. Conform to MPI and manufacturer’s requirements.

2. Safety: comply with requirements of Workplace Hazardous Materials Information System (WHMIS) regarding use, handling storage, and disposal of hazardous materials.

3. Ventilation:

    1. Arrange for ventilation system to be operated during application of paint. Ventilate area of work by use of approved portable supply and exhaust fans.

    2. Provide continuous ventilation during and after application of paint. Run ventilation system twenty-four (24) hours per day during installation; provide continuous ventilation for seven (7) days after completion of application of paint.

4. Apply paint finishes to interior areas only when temperature at location of installation can be satisfactorily maintained within manufacturer's recommendations.

5. Apply paint finishes to exterior areas only when conditions forecast for entire period of application fall within manufacturer's recommendations.

6. Where surface to be painted is not under cover, do not apply paint when:

    1. Substrate and ambient air temperature is below 5°C (41°F) for alkyd and 7°C (45°F) for latex paints or when temperature is expected to drop to 0°C (32°F) before paint has thoroughly cured.

    2. Substrate and ambient air temperature are expected to fall outside limits prescribed in paint standard and by manufacturer.

    3. Temperature of surface is over 50°C (122°F) unless paint is specifically formulated for application at high temperatures.

    4. Rain or snow are forecast to occur before paint has thoroughly cured; it is foggy, misty, raining or snowing at site; relative humidity is above 85%.

    5. Surface to be painted is wet, damp or frosted.

    6. Previous coat is not dry and properly cured.

7. Provide and maintain cover when paint must be applied in damp or cold weather. Heat substrates and surrounding air to comply with temperature and humidity conditions specified by manufacturer. Protect until paint is dry or until weather conditions are suitable.

8. Apply paint finish only when dust is no longer being generated by related construction operations or when wind conditions are such that airborne particles will not affect the quality of the finished surface.

9. Schedule painting operations such that surfaces exposed to direct, intense sunlight are scheduled for completion during early morning.

10. Remove paint from areas which have been exposed to freezing, excess humidity, rain, snow or condensation. Prepare surface again and repaint.

11. Provide temporary heating where permanent facilities are not available to maintain minimum recommended temperatures.

12. Painting in occupied facilities: schedule operations to approval of Consultant such that painted surfaces will have dried and cured sufficiently before occupants are affected.

13. Provide minimum 270 lx on surfaces to be painted.

1.6. Submittals

1. Submit samples and other submittals in accordance with 01 33 00 – Submittal Procedures.

1. GENERAL

1.1. Summary

1. Refer to architectural drawings in conjunction with the specification.

1.2. Section Includes

1. All labour, materials, tools and other equipment, services and supervision required to complete all interior and exterior (including above roof) painting and decorating work as indicated on Finish Schedules and to the full extent of the drawings and specifications.

2. Surface preparation to receive painting and finishing is not included under this section of work, except for priming and back-priming and specific pre-treatments noted herein or specified in the Master Painters Institute (MPI) Painting Specification Manual or Master Painters Institute (MPI) Maintenance and Repainting Manual.

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8. Division 23 - Heating, Ventilation, and Air Conditioning: grilles and diffusers

1.4. Quality Assurance

1. This Contractor shall have a minimum of five (5) years proven satisfactory experience and shall show proof before commencement of work that he will maintain a qualified crew of painters throughout the duration of the work. When requested, Contractor shall provide a list of the last three comparable jobs including, name and location, specifying authority/project manager, start and completion dates and cost amount of the painting work.

2. Only qualified journeymen who have a “Tradesman Qualification Certificate of Proficiency” shall be engaged in painting and decorating work. Apprentices may be employed provided they work under the direct supervision of a qualified journeyman in accordance with trade regulations.

3. Conform to the standards contained in the Master Painters Institute Architectural Painting Specification Manual, latest edition (hereafter referred to as MPI Painting Specification Manual) for all painting products including preparation and application of materials.

4. All paint manufacturers and products used shall be as listed under the “Approved Products” section of the MPI Architectural Painting Specification Manual.

5. Retain purchase orders, invoices and other documents to prove that all materials utilized in the Work meet requirements of the specifications. Produce documents when requested by Consultant.

1.5. Environmental Requirements

1. Conform to MPI and manufacturer’s requirements.

2. Safety: comply with requirements of Workplace Hazardous Materials Information System (WHMIS) regarding use, handling storage, and disposal of hazardous materials.

3. Ventilation:

    1. Arrange for ventilation system to be operated during application of paint. Ventilate area of work by use of approved portable supply and exhaust fans.

    2. Provide continuous ventilation during and after application of paint. Run ventilation system twenty-four (24) hours per day during installation; provide continuous ventilation for seven (7) days after completion of application of paint.

4. Apply paint finishes to interior areas only when temperature at location of installation can be satisfactorily maintained within manufacturer's recommendations.

5. Apply paint finishes to exterior areas only when conditions forecast for entire period of application fall within manufacturer's recommendations.

6. Where surface to be painted is not under cover, do not apply paint when:

    1. Substrate and ambient air temperature is below 5°C (41°F) for alkyd and 7°C (45°F) for latex paints or when temperature is expected to drop to 0°C (32°F) before paint has thoroughly cured.

    2. Substrate and ambient air temperature are expected to fall outside limits prescribed in paint standard and by manufacturer.

    3. Temperature of surface is over 50°C (122°F) unless paint is specifically formulated for application at high temperatures.

    4. Rain or snow are forecast to occur before paint has thoroughly cured; it is foggy, misty, raining or snowing at site; relative humidity is above 85%.

    5. Surface to be painted is wet, damp or frosted.

    6. Previous coat is not dry and properly cured.

7. Provide and maintain cover when paint must be applied in damp or cold weather. Heat substrates and surrounding air to comply with temperature and humidity conditions specified by manufacturer. Protect until paint is dry or until weather conditions are suitable.

8. Apply paint finish only when dust is no longer being generated by related construction operations or when wind conditions are such that airborne particles will not affect the quality of the finished surface.

9. Schedule painting operations such that surfaces exposed to direct, intense sunlight are scheduled for completion during early morning.

10. Remove paint from areas which have been exposed to freezing, excess humidity, rain, snow or condensation. Prepare surface again and repaint.

11. Provide temporary heating where permanent facilities are not available to maintain minimum recommended temperatures.

12. Painting in occupied facilities: schedule operations to approval of Consultant such that painted surfaces will have dried and cured sufficiently before occupants are affected.

13. Provide minimum 270 lx on surfaces to be painted.

1.6. Submittals

1. Submit samples and other submittals in accordance with 01 33 00 – Submittal Procedures.

2. Submit two (2) sets of Material Safety Data Sheets (MSDS) prior to commencement of work for review and for posting at job site as required.

3. Provide an itemized list complete with manufacturer, paint type and colour coding for all colours used for Owner's later use in maintenance.

4. When requested by the Consultant prepare and paint designated surface, area, room or item (in each colour scheme) to requirements specified herein, with specified paint or coating showing selected colours, gloss/sheen, textures and workmanship to MPI Painting Specification Manual standards for review and approval. When approved, surface, area, room and/or items shall become acceptable standard of finish quality and workmanship for similar on-site work.

5. Submit duplicate samples of each paint, stain and clear coating on the material specified.

1.7. Warranty

1. Provide and pay for either:

    1. The local MPI Accredited Quality Assurance Association's 2 Year Guarantee; or,

    2. 100% 2 Year Maintenance Bond in accordance with MPI Painting Specification Manual requirements for painting, commencing at date of Substantial Performance.

2. The Guarantee or Maintenance Bond shall cover making good any labour or material defects for a period of up to and including 2 years after substantial performance.

1.8. Delivery, Storage and Handling

1. Deliver and store materials in original containers, sealed, with labels intact.

2. Indicate on containers or wrappings:

    1. Manufacturer's name and address.

    2. Type of paint.

    3. Compliance with applicable standard.

    4. Colour number in accordance with established colour schedule.

3. Remove damaged, opened and rejected materials from site.

4. Provide and maintain dry, temperature controlled, secure storage.

5. Observe Manufacturer's recommendations for storage and handling.

6. Store materials and supplies away from heat generating devices.

7. Store materials and equipment in a well ventilated area with temperature range 7 to 30°C (45 to 86°F).

8. Store temperature sensitive products above minimum temperature as recommended by manufacturer.

9. 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.

10. Provide minimum one Type ABC fire extinguisher adjacent to storage area.

11. Remove only in quantities required for same day use.

12. Fire Safety Requirements:

1. 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.

2. Handle, store, use and dispose of flammable and combustible materials in accordance with the National Fire Code of Canada.

1.9. Extra Materials

1. Submit maintenance materials in accordance with Section 01 78 00 – Closeout Submittals.

2. Submit one (1) 3.78 litre (1 US gallon) can of each type and colour of primer, stain, and finish coating used. Identify colour and paint type in relation to established colour schedule and finish formula.

3. Deliver to Owner and store where directed.

1.10. Waste Management

1. Place materials defined as hazardous or toxic waste, including used sealant and adhesive tubes and containers, in containers or areas designated for hazardous waste.

2. Return solvent and oil soaked rags, used during installation, for contaminant recovery, proper disposal, or appropriate cleaning with no contaminant release to water systems.

3. Set aside and protect the following surplus and uncontaminated waste finish materials: (primer, stain, and finish coating used). Deliver to or arrange collection by employees for verifiable re-use or re-manufacturing.

4. Close and seal tightly all partly used sealant and adhesive containers and store protected in well ventilated fire-safe area at moderate temperature.

5. Do not dispose of paints or solvents by pouring on the ground. Place in designated containers and ensure proper disposal.

6. Solvent based paints, wood preservatives, stains and finishes which cannot be reused must be treated as hazardous waste and disposed of in an appropriate manner in accordance with hazardous waste regulations. Empty paint cans are to be dry prior to disposal or recycling (where available).

7. Where paint recycling is available, collect all waste paint by type and provide for delivery to recycling or collection facility.

8. Paints, stains and finishes are regarded as hazardous products and are subject to regulations for disposal. Information on these controls can be obtained from the Provincial Ministries of Environment and Regional levels of Government.

2. PRODUCTS

2.1. Materials

1. Provide all materials (primers, paints, coatings, varnishes, stains, lacquers, fillers, thinners, solvents, etc.) in accordance with the MPI Painting Specification Manual “Approved Product” listing and from a single manufacturer for each system used.

    1. Approved manufacturers: Sherwin Williams, Benjamin Moore, Cloverdale; or pre-approved equivalent.

2. Provide all other paint materials such as linseed oil, shellac, etc. of the highest quality product of an approved manufacturer listed in the MPI Painting Specification Manual and compatible with other coating materials as required.

3. Provide all materials and paints lead and mercury free and with low VOC content where possible.

4. All paint materials shall have good flowing and brushing properties and shall dry or cure free of blemishes or sags.

5. Where required, paints and coatings shall meet flame spread and smoke developed ratings designated by local Code requirements and/or authorities having jurisdiction.

6. Glass reflective beads (for pavement marking) of type suitable for application to a wet paint surface for light reflectance. Apply beads at a minimum rate of 0.5 kg/l (5 lbs/g) to a white and/or yellow latex or alkyd zone/traffic marking paint of approved type as listed in the MPI Architectural Painting Specification Manual.

2.2. Colours

1. Colour schedule provided by Consultant on the drawings for interior colours (Finishes List) and on the drawings for exterior colours (Exterior Materials List).

    1. Interior colours

        1. PT-1: Benjamin Moore Chantilly Lace OC-65

    2. Exterior colours

2. Perform all colour tinting operations prior to delivery of paint to site. On-site tinting of painting materials allowed only with Consultant's written permission.

3. Second coat in a three coat system to be tinted slightly lighter colour than top coat to show visible difference between coats.

2.3. Equipment

1. Painting and decorating equipment: to best trade standards for type of product and application.

2. Spray painting equipment: of ample capacity, suited to the type and consistency of paint or coating being applied and kept clean and in good working order at all times.

2.4. Mixing and Tinting

1. Ready-mix paints unless otherwise specified. Re-mix prior to application to ensure colour and gloss uniformity.

2. Mix paste, powder or catalyzed paint in strict accordance with manufacturer’s written instructions.

3. Perform all colour tinting operations prior to delivery of paint to site.

4. Addition of thinner not to exceed paint manufacturer’s recommendations.

2.5. Gloss

1. Paint gloss: defined as the sheen rating of applied paint, in accordance with the following values:

Gloss Level	Description	Units @ 60 degrees	Units @ 85 degrees
G1	Matte or Flat finish	0 to 5	10 maximum
G2	Velvet finish	0 to 10	10 to 35
G3	Eggshell finish	10 to 25	10 to 35
G4	Satin finish	20 to 35	35 minimum
G5	Semi-Gloss finish	35 to 70	
G6	Gloss finish	70 to 85	
G7	High-Gloss finish	> 85	

2. Finish (gloss level) of all painted surfaces as specified herein or as noted on Finish Schedule.

2.6. Schedule – Finishes – General

1. Paint finishes selected by the Consultant.

2. Generally and unless otherwise specified herein or noted on Finish Schedules:

    1. Except as noted herein, paint walls and ceiling surfaces using an eggshell (G3) finish and all doors, frames and trim using a semi-gloss (G5) finish.

    2. Paint walls and ceilings in food preparation areas using a semi-gloss (G5) finish.

2.7. Schedule – Exterior Finishes

1. Paint exterior surfaces in accordance with the following MPI Painting Specification Manual requirements as follows.

2. Asphalt Surfaces: (zone/traffic marking for drive and parking areas, etc.)

    EXT 2.1A Latex zone/traffic marking finish.

3. Structural Steel and Metal Fabrications:

    EXT 5.1D Alkyd (G5 semi-gloss) finish.

4. Glue Laminated Beams and Columns:

    EXT 6.1D Semi-transparent stain finish.

    Acceptable product:

    1. Glu-lam columns/beams: Sansin KP-12 as base coat. and Sansin SDF top coat

5. Dimension Lumber: (columns, beams, exposed joists, underside of decking, siding, fencing, pergolas, etc.)

    EXT 6.2D Semi-transparent stain finish.

    Acceptable product:

    1. 2x2 guardrails: PPG ProLuxe Cedar SRD Exterior Transparent Matte Wood Finish

6. Dressed Lumber: (smooth facias and soffits)

    EXT 6.3E Semi-transparent stain finish.

Acceptable product:

1. Cedar wall cladding: Benjamin Moore Arborcoat Stain- Semi Transparent Flat, F638 (2 coats)

7. Fibre Cement Cladding:

EXT 6.2A Latex (G3/4 low sheen).

8. Wood Siding:

1. Approved product: 2x12 western red cedar clear Exterior wood siding -

1. Coat 1: Sansin SDF Foundation Clear

2. Coat 2: Sanain SDF Top Coat

3. Coat 3: Scuff sand P220, Sansin Top Coat

2. Approved product: 2x12 western red cedar dark Exterior wood siding -

1. Coat 1: Sansin SDF Foundation Clear

2. Coat 2: Sansin Woodforce Slate Grey

3. Coat 3: Sansin Woodforce Slate Grey

3. Wood Decking

1. Coat 1: Sansin Dec Natural Cedar 1101

2. Coat 2: Sansin Dec Natural Cedar 1101

4. Wood Fascia

5. Approved Manufacturer: PPG ProLuxe Premium Wood Finish 077 Cedar

9. Exterior paint and stain colours

1. Refer to Materials Table on sheet A401.

2.8. Schedule – Interior Finishes

1. Paint interior surfaces in accordance with the following MPI Painting Specification Manual requirements as follows.

2. Concrete Horizontal Surfaces: (floors)

INT 3.2G Waterborne concrete floor sealer.

3. Structural Steel and Metal Fabrications (cross braces):

INT 5.1E Alkyd semi-gloss (G5) finish.

4. Steel – High Heat: (boilers, furnaces, heat exchangers, pipes, flues, stacks, etc. (temperature range as noted)

Refer to mechanical specification sections.

5. Dimension Lumber: (columns, beams, exposed joists, underside of decking, etc.)

INT 6.2B High Performance Architectural Latex.

6. Dressed Lumber: (including doors, door and window frames, casings, moldings, etc.)

INT 6.3A High Performance Architectural Latex.

7. Plaster and Gypsum Board: (gypsum wallboard, drywall, “sheet rock type material”, etc.)

   INT 9.2B High Performance Architectural Latex.

8. Interior Paint Colours

   1. **PT-1**: Benjamin Moore OC-65 Chantilly Lace (2121-70)

3. EXECUTION

3.1. General

1. Perform all painting operations for premium grade work in accordance with MPI Painting Specification Manual requirements except where specified otherwise.

2. Apply all paint materials in accordance with paint manufacturer’s written application instructions.

3.2. General Preparation

1. Remove electrical cover plates, light fixtures, surface hardware on doors, door stops, bath accessories and all other surface mounted fittings and fastenings prior to undertaking any painting operations. Store for re-installation after painting is completed.

2. As painting operations progress, place “WET PAINT” signs in occupied areas to approval of Consultant.

3.3. Protection

1. Protect existing building surfaces not to be painted from paint spatters, markings and other damage. If damaged, clean and restore such surfaces as directed by Consultant.

2. Cover or mask floors, windows and other ornamental hardware adjacent to areas being painted to prevent damage and to protect from paint drops and splatters. Use non-staining coverings.

3. Protect items that are permanently attached such as Fire Labels on doors and frames.

4. Protect factory finished products and equipment.

5. Protect passing pedestrians, building occupants, and the general public in and about the building.

3.4. Existing Conditions

1. Investigate existing substrates for problems related to proper and complete preparation of surfaces to be painted. Report to Consultant all damage, defects, unsatisfactory or unfavourable conditions before proceeding with work.

2. Investigate moisture content of surfaces to be painted and report findings to Consultant. Do not proceed with work until conditions fall within acceptable range as recommended by Manufacturer.

3. Maximum moisture content as follows:

   1. Plaster and wallboard: 12%.

   2. Masonry/Concrete: 12%.

   3. Concrete Block/Brick: 12%.

   4. Wood: 15%.

3.5. Cleaning

1. Clean all surfaces to be painted as follows:
    1. Remove all dust, dirt, and other surface debris by vacuuming, wipe with dry, clean cloth, or compressed air where suitable.
    2. Wash surfaces with solution of T.S.P., bleach and clean warm water using a stiff bristle brush to remove dirt, oil and other surface contaminants. Test cleaning materials on a small inconspicuous location before proceeding.
    3. Rinse scrubbed surfaces with clean water until foreign matter is flushed from surface.
    4. Allow surfaces to drain completely and allow to dry thoroughly.
    5. To prepare surfaces for water-based painting, water-based cleaners should be used in place of organic solvents.
    6. Use trigger operated spray nozzles for water hoses.
    7. Many water-based paints cannot be removed with water once dried. However, minimize the use of kerosene or any such organic solvents to clean up water-based paints.
2. 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.
3. Sand existing surfaces with intact, smooth, high gloss coatings to provide adequate adhesion for new finishes.

3.6. Surface Preparation

1. Prepare all surfaces in accordance with MPI Painting Specification Manual requirements. Refer to the Manual for specific surface preparation requirements for each substrate material not included below.
2. Where possible, prime all surfaces of new wood before installation. Use same primers specified for exposed surfaces.
3. Previously painted wood surfaces:
    1. Apply vinyl sealer over knots, pitch, sap and resinous areas.
    2. Apply wood filler to nail holes and cracks.
    3. Tint filler to match stains for stained woodwork.
4. Prepare new concrete floor by acid etching. Rinse with clean water and thoroughly dry.

3.7. Surface Preparation – Metal

1. Prepare all surfaces in accordance with MPI Painting Specification Manual requirements. Refer to the Manual for specific surface preparation requirements for each substrate material not included below.
2. Clean new metal surfaces to be painted by: removing rust, loose mill scale, welding slag, dirt, oil, grease and other foreign substances
3. Clean existing metal surfaces to be repainted by: removing loose, cracked, brittle or non-adherent paint, rust, loose mill scale, welding slag, dirt, oil, grease and other foreign substances in accordance with following:

1. Scrape edges of old paint back to sound material. Where remaining paint is thick and sound, feather exposed edges.

2. Commercial blast clean rusted and bare metal surfaces where existing paint system has failed.

4. Remove traces of blast products from surfaces, pockets and corners to be painted by brushing with clean brushes, blowing with clean dry compressed air, or vacuum cleaning.

5. Touch up shop primer with primer as specified in applicable section. Touch-up to include cleaning and painting of field connections, welds, rivets, nuts, washers, bolts, and damaged or defective paint and rusted areas.

6. Do not apply paint until prepared surfaces have been accepted by Consultant.

3.8. Mixing

1. Mix ingredients in container before and during use and ensure breaking up of lumps, complete dispersion of settled pigment, and uniform composition.

2. Thin paint for spraying according to Manufacturer’s instructions. If directions are not on container, obtain instructions in writing from manufacturer and provide copy of instructions to Consultant.

3. Do not use kerosene or any such organic solvents to thin water-based paints.

3.9. Application

1. Do not paint unless substrates are acceptable and/or until all environmental conditions (heating, ventilation, lighting and completion of other subtrade work) are acceptable for applications of products.

2. Paint all surfaces requiring paint or stain finish to minimum MPI Painting Specification Manual finish requirements with application methods in accordance with best trade practices for type and application of materials used. Back prime all exterior wood surfaces.

3. Apply paint by brush, roller, air sprayer, or airless sprayer. Conform to manufacturer's application instructions unless specified otherwise.

4. Brush application:

    1. Work paint into cracks, crevices and corners. Paint surfaces not accessible to brushes by spray, daubers or sheepskins.

    2. Brush out runs and sags.

    3. Remove runs, sags and brush marks from finished work and repaint.

5. Spray application:

    1. Provide and maintain equipment that is suitable for intended purpose, capable of properly atomizing paint to be applied, and equipped with suitable pressure regulators and gauges.

    2. Keep paint ingredients properly mixed in containers during paint application either by continuous mechanical agitation or by intermittent agitation as frequently as necessary.

    3. Apply paint in a uniform layer, with overlapping at edges of spray pattern.

    4. Brush out immediately all runs and sags.

    5. Use brushes to work paint into cracks, crevices and places which are not adequately painted by spray.

6. Use dipping, sheepskins or daubers only when no other method is practical in places of difficult access and only when specifically authorized by Consultant.

7. Apply each coat of paint as a continuous film of uniform thickness. Repaint thin spots or bare areas before next coat of paint is applied.

8. Allow surfaces to dry and properly cure after cleaning and between subsequent coats for minimum time period as recommended by manufacturer.

9. Sand and dust between each coat to remove visible defects.

10. Finish tops of cupboards, cabinets and projecting ledges, both above and below sight lines as specified for surrounding surfaces.

11. Finish closets and alcoves as specified for adjoining rooms.

12. Finish top, bottom, edges and cutouts of doors after fitting as specified for door surfaces.

13. Use aggregate coating or a slip resistant additive in paint for surfaces as noted (e.g. stair treads/ landings, handrails, etc.) where scheduled to be painted.

14. Continue paint finishes through behind wall-mounted items.

15. Top and bottom edges of wood and metal doors must be primed with an undercoat, stain or varnish, depending on the finish specified and finished the same as the door faces. Wood door edges must be re-primed immediately (same day) after they are cut, trimmed or planed.

3.10. Mechanical and Electrical Equipment

1. In finished areas and on the exterior: paint exposed conduits, piping, hangers, ductwork and other mechanical and electrical equipment. Colour and texture to match adjacent surfaces, except as noted otherwise.

2. In boiler room, mechanical and electrical rooms: paint exposed conduits, piping, hangers, ductwork and other mechanical and electrical equipment.

3. In other unfinished areas: leave exposed conduits, piping, hangers, ductwork and other mechanical and electrical equipment in original finish and touch up scratches and marks.

4. Touch up scratches and marks on factory painted finishes and equipment with paint as supplied by manufacturer of equipment.

5. Do not paint over nameplates.

6. Keep sprinkler heads free of paint.

7. Paint inside of ductwork where visible behind grilles, registers and diffusers with primer and one coat of matt black paint.

8. Paint disconnect switches for fire alarm system and exit light systems in red enamel.

9. Paint all fire protection piping as indicated in mechanical sections.

10. Paint gas piping gas standard yellow where visible in service spaces.

11. Paint both sides and edges of backboards for telephone and electrical equipment before installation. Leave equipment in original finish except for touch-up as required, and paint conduits, mounting accessories and other unfinished items.

3.11. Field Quality Control

1. Advise Consultant when each applied coating is ready for inspection. Do not proceed with subsequent coats until previous coat has been approved.

2. Co-operate with inspection firm and provide access to all areas of the work.

3.12. Restoration

1. Clean and re-install all hardware items that were removed before undertaken painting operations.

2. Remove protective coverings and warning signs as soon as practical after operations cease.

3. Remove paint splashes on exposed surfaces that were not painted. Remove smears and spatter immediately as operations progress, using compatible solvent.

4. Protect 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

1. GENERAL

1.1. Summary

1. Refer to architectural drawings in conjunction with the specification.

1.2. Section Includes

1. Provide all labour, materials, tools, and other equipment, services and supervision required for installation of building specialties and accessories as indicated on drawings and specified herein. Other building specialties may be contained in other Sections.

2. Supply and install:

    1. Interior mailbox.

    2. Wall-mounted key cabinet.

    3. Fire exit diagrams.

    4. Corner Guards.

    5. Roof space access hatch.

    6. Roof access hatch.

    7. Exterior foot grille.

    8. Fire Extinguisher C/W cabinet for kitchen

1.3. Shop Drawings

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

2. An itemized list showing location and number of each building specialty group is to accompany the shop drawings. Include Manufacturer’s product specifications and installation instructions.

3. Submit shop drawings for the following building specialties:

    1. Interior mailbox:

    2. Wall-mounted key cabinet:

    3. Fire exit diagrams:

    4. Corner Guards:

    5. Roof space access hatch:

    6. Roof access hatch:

    7. Exterior foot grille: show layout and types of floor grates and frames not less than half-scale sections of typical installations, details of patterns or designs, anchors, and accessories, and field measurements of slab recess to receive frames.

1.4. Samples

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

2. Submit samples for the following building specialties:

    1. Fire exit diagrams: duplicate samples.

    2. Corner Guards: duplicate sample, 300 mm (1’-0”) long.

1.5. Maintenance

1. Submit in product maintenance information accordance with Section 01 78 00 – Closeout Submittals, for all building specialties

1.6. Waste Management and Disposal

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

2. Collect and separate plastic, paper packaging and corrugated cardboard in accordance with Waste Management Plan.

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

2. PRODUCTS

2.1. Building Identification Signage (Exterior)

1. "Arts and Heritage Hub" building: individual 200 mm tall cast or laser cut metal numbers "701", white vinyl. Typeface: sans serif style. Letters mounted on glass above the main door.

2. Vinyl: All applied vinyl to be long-life minimum 2-mil thickness, sizes, fonts, materials and colours as shown on Drawings.

    1. Acceptable Products:

        1. Avery Dennison SC900 Series in colours as chosen.

3. Fire Extinguisher Cabinet: National Fire Equipment Ltd. 102F

4. Fire Extinguisher: Badger 2A10BC FX

3. EXECUTION

3.1. Building Identification Signage (Exterior)

1. Install signage in accordance with manufacturer's written instructions in locations as directed by Consultant.

3.2. Room Identification and Exiting Signage

1. Install signage in accordance with manufacturer's written instructions.

3.3. Clean-up

1. Promptly as the work proceeds and on completion remove from the job-site all packaging materials and waste materials resulting from the work of this section.

END OF SECTION

1. GENERAL

1.1. Summary

1. Refer to architectural drawings in conjunction with the specification.

1.2. Section Includes

1. Provide all labour, materials, tools, and other equipment, services and supervision required for installation of wall protection and accessories as indicated on drawings and specified herein. Other building specialties may be contained in other Sections.

1.3. Shop Drawings

1. Submit shop drawings in accordance with Section 01 33 00 – Submittal Procedures.
2. Product data and detailed specifications for each system component and installation accessory required, including installation methods for each type of substrate.
3. Shop drawings showing locations, extent and installation details of wall covering products.
4. Samples for verification purposes: Submit the following samples, as proposed for this work, for verification of color, texture, pattern and thickness:
    1. Sample of each product specified.

2. Maintenance data for wall protection system components for inclusion in the operating and maintenance manuals specified in Division 1.

1.4. Samples

1. Submit samples in accordance with Section 01 33 00 – Submittal Procedures.
2. Submit samples for the following building specialties:
    1. Wall covering

1.5. Quality Assurance

1. Installer qualifications: Engage an installer who has no less than 3 years experience in installation of systems similar in complexity to those required for this project.
2. Manufacturer's qualifications: Not less than 5 years experience in the production of specified products and a record of successful in-service performance.
3. Code compliance: Assemblies should conform to all applicable codes including BCBC.
4. Fire performance characteristics: Provide stainless steel components tested in accordance with ASTM E84 for Class A/1 fire characteristics.
5. Single source responsibility: Provide all components of the wall protection system manufactured by the same company to ensure compatibility of color, texture and physical properties.

1.6. Delivery, Storage and Handling

1. Deliver materials to the project site in unopened original factory packaging clearly labeled to show manufacturer.
2. Materials must be stored flat.

1.7. Project Conditions

1. Installation areas must be enclosed and weatherproofed before installation commences.

1.8. Maintenance

1. Submit in product maintenance information accordance with Section 01 78 00 – Closeout Submittals, for all building specialties

1.9. Waste Management and Disposal

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

2. Collect and separate plastic, paper packaging and corrugated cardboard in accordance with Waste Management Plan.

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

2. PRODUCTS

2.1. Manufacturers

1. Construction Specialties, Inc., Foundry Stainless Fabrications, Vortex Restaurant Equipment

2.2. Materials

1. Stainless Steel: Material to be 16 gauge type 304 alloy with #4 satin finish.

2. Design Basis: Stainless Steel Sheet to be CS Acrovyn: Nominal .0625" (1.59mm) thick stainless steel sheet with standard Smooth texture. Supplied in 4' x 8' or 10' (1.2m x 2.4m or 3.0m) sheet sizes. Diamond Plate texture available.

2.3. Fabrication

1. General: Fabricate wall protection products to comply with requirements indicated for design, dimensions, detail, finish and sizes.

2.4. Finishes

1. General: Comply with NAAMM "Metal Finishes Manual" for recommendations relative to applications and designations of finishes.

2.5. Accessories

1. Mounting: Stainless steel wall protection shall be furnished as a complete packaged system, including appropriate adhesive or mechanical fasteners.

3. EXECUTION

3.1. Examination

1. Verification of conditions: Examine areas and conditions under which work is to be performed and identify conditions detrimental to proper or timely completion.

    1. Do not proceed until unsatisfactory conditions have been corrected.

3.2. Preparation

1. Surface preparation: Prior to installation, clean substrate to remove dirt, debris and loose particles. Perform additional preparation procedures as required by manufacturer's instructions.

2. Protection: Take all necessary steps to prevent damage to material during installation as required in manufacturer's installation instructions.

3.3. Installation

1. Install the work of this section in strict accordance with the manufacturer’s recommendations using only approved hardware and locating all components firmly into position level and plumb

3.4. Cleaning

1. General: Immediately upon completion of installation, clean wall protection products and accessories in accordance with manufacturer's recommended cleaning method.

2. Remove surplus materials, rubbish and debris resulting from installation as work progresses and upon completion of work.

3.5. Protection

C. Protect installed materials to prevent damage by other trades. Use materials that may be easily removed without leaving residue or permanent stains.

END OF SECTION

1. GENERAL

1.1. Summary

1. Refer to architectural drawings in conjunction with the specification.

1.2. Section Includes

1. Provide all labour, materials, tools, and other equipment, services and supervision necessary for the supply and complete installation of all toilet and bath accessories as indicated in the drawings and as specified herein.

1.3. Related Sections

1. 06 10 10 - Rough Carpentry
2. 07 92 10 - Joint Sealing
3. 09 21 16 - Gypsum Board Assemblies (Mould and Moisture Resistant Gypsum Board)

1.4. Shop Drawings

1. Submit shop drawings in accordance with Section 01 33 00 – Submittal Procedures.
2. Indicate size and description of components, base material, surface finish inside and out, hardware and locks, attachment devices, description of rough-in-frame, building-in details of anchors for grab bars.

1.5. Samples

1. Submit samples in accordance with Section 01 33 00 – Submittal Procedures.
2. Samples to be returned for inclusion into work.

1.6. Closeout Submittals

1. Provide maintenance data for toilet and bath accessories for incorporation into manual specified in Section 01 78 00 – Closeout Submittals.

1.7. Waste Management and Disposal

1. Separate and recycle waste materials in accordance with Section 01 74 19 – Construction Waste Management and Disposal.
2. Collect and separate plastic, paper packaging and corrugated cardboard in accordance with Waste Management Plan.

1.8. Extra Materials

1. Provide special tools required for accessing, assembly/disassembly or removal for toilet and bath accessories in accordance with requirements specified in Section 01 78 00 – Closeout Submittals.
2. Deliver special tools to Owner

1.9. Delivery, Storage and Handling

1. Deliver washroom accessories to the job site in original containers bearing manufacturer’s labels.
2. Protect the products and materials of this Section before, during and after installation, and protect adjacent installed work of other Sections.

2. PRODUCTS

2.1. Materials

1. Sheet steel: to ASTM A653/A653M with ZF001 (A01) designation zinc coating.

2. Stainless steel sheet metal: to ASTM A167, Type 304.

3. Stainless steel tubing: commercial grade, seamless welded, 1.2 mm (0.064") wall thickness.

4. Fasteners: concealed screws and bolts hot dip galvanized, exposed fasteners to match face of unit. Expansion shields fibre, lead or rubber as recommended by accessory manufacturer for component and its intended use.

2.2. Components

UWC, Male and Female washrooms. Refer to architectural drawings for quantities and locations.

1. Toilet tissue dispenser: wall mount, satin stainless steel roll dispenser with shelf.

    1. Acceptable product: "5263 Double Roll Toilet Tissue Dispenser" by Bradley.

2. Towel dispenser: surface mounted satin stainless steel wall unit, approximately 275 mm wide, 335 mm high, 125 mm deep. Suitable for dispensing multi-fold or C-fold towels.

    1. Acceptable product: "B-4262 Contura Series" by Bobrick.

3. Soap dispenser – wall mount: automatic foam dispensing, satin stainless steel, 1.0 mm (18 gauge) thickness; top locking device;

    1. Acceptable product: "B-2013 Automatic Wall-Mounted Foam Dispenser" by Bobrick.

4. Sanitary napkin disposal bin: satin stainless steel recessed, continuous hinged door, self closing, embossed with "napkin disposal" or universally accepted symbol, removable plastic receptacles, 2.7 L, fitted with spring clip for deodorizer block.

    1. Acceptable product: "B-4353 Contura Series" by Bobrick. (recessed 4.6 L)

5. Stainless Steel Shelf: satin stainless steel, 1.2mm (18 gauge), welded back return. 18"x 8".

    1. Universal washroom: Acceptable product: "B-298 x 18 Stainless Steel Shelf" by Bobrick

6. Residential accessible washroom toiletry shelf

    1. Acceptable product: "B-683 x 24 Surface-Mounted Toiletry Shelf" by Bobrick

7. Grab bars: 30 mm (1-1/4") diameter x 1.2 mm (18 gauge) wall tubing of stainless steel, 76 mm (3") diameter wall flanges, concealed screw attachment, flanges welded to tubular bar, provided with steel back plates and all accessories. Peened gripping surface. Grab bar material and anchorage to withstand downward pull of 2.2 kN.

    1. Acceptable products:

        1. Grab Bar 24" by Bobrick B-5806.99x24, Peened

        2. Grab Bar Vertical 30" x 30" 90ºV by Bobrick B-5895.99, Peened

8. Diaper changing station: recessed wall unit, stainless steel, stainless steel insert, moulded-in steel-on-steel hinge assembly, moulded-in integral support mechanism, 864 mm wide x 533 mm high, concealed gas shock, security lock, tamper resistant hardware, steel backer plate, diaper bag hook, liner dispenser, safety belt, safety instructions in both official languages, graphic illustration, labelled with universally accepted symbol or "changing station".

1. Acceptable products: “Koala Kare KB311-SSRE - Vertical Stainless Steel Recess Mounted Baby Changing Station” by Koala Kare.

9. Mirror: wall mounted unit, fixed channel framed mirror 6 mm to CAN/CGSB-12.5, satin stainless steel frame; 460 x 760 mm.

    1. Acceptable product: “B-165 2436” by Bobrick, or pre-approved equivalent.

10. Sharpes Container

    1. American Specialties Inc 0548, Satin, 5” deep recess required in wall

11. Waste Receptacle

    1. Bobrick B-43644 Stainless Steel, Satin

12. Hook

    1. Bobrick B-542 Stainless Steel, Satin

2.3. Fabrication

1. Weld and grind joints of fabricated components flush and smooth. Use mechanical fasteners only where approved.

2. Wherever possible form exposed surfaces from one sheet of stock, free of joints.

3. Brake form sheet metal work with 1.5 mm (1/16”) radius bends.

4. Form surfaces flat without distortion. Maintain flat surfaces without scratches or dents.

5. Back paint components where contact is made with building finishes to prevent electrolysis.

6. Hot dip galvanize concealed ferrous metal anchors and fastening devices to CSA G164.

7. Shop assemble components and package complete with anchors and fittings.

8. Deliver inserts and rough-in frames to job site at appropriate time for building-in. Provide templates, details and instructions for building in anchors and inserts.

9. Provide steel anchor plates and components for installation on studding and building framing.

2.4. Finishes

1. Chrome and nickel plating: to ASTM B456, finish as specified.

2. Baked enamel: condition metal by applying one coat of metal conditioner to CGSB 31-GP-107Ma, apply one coat Type 2 primer to CAN/CGSB-1.81 and bake, apply two coats Type 2 enamel to CAN/CGSB-1.88 and bake to hard, durable finish. Sand between final coats. Colour selected from standard range by Consultant.

3. EXECUTION

3.1. Installation

1. Install and secure accessories rigidly in place as follows:

    1. Stud walls: install steel back-plate to stud prior to plaster or drywall finish. Provide plate with threaded studs or plugs.

    2. Hollow masonry units or existing plaster/drywall: use toggle bolts drilled into cell/wall cavity.

3. Solid masonry, marble, stone or concrete: use bolt with lead expansion sleeve set into drilled hole.

4. Toilet/shower compartments: use male/female through bolts.

2. Install grab bars on built-in anchors provided by bar Manufacturer.

3. Use tamper proof screws/bolts for fasteners.

4. Fill units with necessary supplies shortly before final acceptance of building.

5. Install mirrors in accordance with Section 08 80 50 – Glazing.

3.2. Schedule

1. Locate accessories where indicated and as follows. Exact locations determined by Consultant. Refer to architectural drawings for quantities and locations.

2. Toilet tissue dispenser: mounting height of 600 mm above finished floor and closest edge of the dispenser is 150 mm from the front of the water closet.x

3. Paper towel dispenser: maximum height of dispenser and operable part from floor 1200 mm. Refer to drawings for dimensions.

4. Soap dispenser: mounting height from floor of 1000 mm to operable function.

5. Feminine napkin disposal bin: mounting height 736 mm above finished floor to operable function

6. Shower rod (and curtain): mounting height 1930 mm above finished floor.

7. Shower seat: mounting height from floor 470 mm.

8. Towel bar: one adjacent to each shower unit mounting height 1067 mm above finished floor.

9. Grab bars:

    1. Toilets:

        1. Height of horizontal component of grab bar from floor 820 mm o/c.

        2. ‘L’ shape grab bar: minimum distance passed front edge of toilet to vertical component to be 150 mm.

    2. Showers: two in each shower compartment as per specification.

        1. Height of ‘L’ shape bar to have mounting height above floor of 820 mm for the horizontal component. Vertical component mounted 400 mm- 500 mm from side wall on which the vertical bar is mounted.

        2. Located vertically on side wall 50 mm from clear space. Lower end mounting height above floor of 635 mm

10. Robe hook:

    1. one next to non accessible/adaptable shower stall mounting height 1400 mm above finished floor.

    2. one next to accessible/adaptable shower stall mounting height 1200 mm above finished floor

    3. two on non accessible/adaptable bathroom doors in units with mounting heights of 1600 mm for

4. two on accessible/adaptable bathroom doors in units with mounting heights of 1200 mm

11. Waste receptacle: one for each towel dispensers, adjacent to wash basin area. Maximum height of dispenser and operable part from floor 1200 mm.

12. Medicine cabinets: where indicated. Maximum height of dispenser and operable part from floor 1200 mm. Acceptable product: Model 175-11 — Surface-Mounted

13. Mirror: one at each wash basin, height of bottom edge of mirror from floor 1000 mm.

14. Shelf: one in universal washroom, mounting height from floor 860 mm.

15. Diaper changing station: one in universal washroom mounting height from floor 860 mm to the top of the work surface.

3.3. Clean-up

1. All finished surfaces shall be left clean and free from marks, scratches and other imperfections. Remove all manufacturer's labels, excess and waste materials and packaging.

2. Promptly as the work proceeds and on completion of the installation clean up and remove all excess and waste materials, dust and debris, from the building.

END OF SECTION

1. GENERAL

1.1. Summary

1. Refer to architectural drawings in conjunction with the specification.

1.2. Section Includes

1. Provide all labour, materials, tools, and other equipment, services and supervision required for installation of residential kitchen and laundry appliances and accessories as indicated on drawings and specified herein. Other building specialties may be contained in other Sections.

1.3. Shop Drawings

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

2. An itemized list showing location and number of each building specialty group is to accompany the shop drawings. Include Manufacturer's product specifications and installation instructions.

1.4. Maintenance

1. Submit in product maintenance information accordance with Section 01 78 00 – Closeout Submittals, for all building specialties

1.5. Waste Management and Disposal

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

2. Collect and separate plastic, paper packaging and corrugated cardboard in accordance with Waste Management Plan.

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

1.6. Energy Ratings

1. All appliances to qualify under BC Hydro's Power Smart New Home Program.

2. PRODUCTS

1. Refrigerator: Fisher & Paykel RF201AXJSX1_N

2. Range: LG LSE 4616ST

3. Range Hood: LG LSHD3080ST

4. Dishwasher: LG LDT7808ST

5. Microwave: LG LMC1575ST

3. EXECUTION

3.1. Installation

1. Set appliances in place, connect them, and leave them level, clean, and tested for proper operation. Ensure doors operate freely, without hitting or binding on kitchen cabinets. Refrigerator doors shall close by gravity, gently but securely. Set clocks to local time; install appliance lamps as required.

2. Reverse handing of refrigerator doors as necessary to suite reverse kitchen layouts.

3. Handle all appliances carefully during delivery and installation, and take care to avoid damage to finished wall surfaces and floor coverings. If damage occurs, notify General Contractor prior to leaving the jobsite.

4. Make good all damage to wall and floor surfaces at no additional cost to Owner, to satisfaction of Consultant.

3.2. Clean-up

1. remove all manufacturer's cartons, packing materials, metal bands and protective covers from the building premises and remove from jobsite.

2. Make a list of all appliances, models, and serial numbers cross referenced to location (suite numbers); forward list to Owner.

END OF SECTION