



Halifax

Regional Centre for Education

RFP #4278

Exterior Envelope Renewal Harrietsfield Elementary School

RFP Closing Date: Monday - September 29, 2025
RFP Closing Time: 2:00 PM (ATL)
Submission Email: hrcetenders@hrce.ca

Ready-for-Takeover Date: Friday - January 30, 2026

HRCE Procurement Contact:
Nancy Rideout, Purchasing Manager
Office: (902) 464-2000 ext 2222
Email: nrideout@hrce.ca

Operations Contact:
Patrick Ross, Project Manager
Cell: (902) 399-4345
Email: Patrick.Ross@hrce.ca

School Location:
Harrietsfield Elementary
1150 Old Sambro Road
Harrietsfield, NS B3V 1B1

Mandatory Site Meeting for Bidders:
Wed – September 17, 2025 at 10:00am
Harrietsfield Elementary
Please meet at School Entrance

RFP submissions are to be submitted by email to: hrcetenders@hrce.ca

RFP documents are available for download from the HRCE's Website:
<https://www.hrce.ca/about-hrce/financial-services/tenders/tender-listing>

In the light of COVID-19 and future pandemics, all vendors are required to follow the guidelines set in place by Nova Scotia Health Authority. Potential risks such as restricted accessibility to schools and buildings of the Halifax Regional Centre for Education (HRCE), inability to complete work on a timely manner due to social distancing, disabled supply chains which will result in delivery delays of raw materials and finished goods, labour shortages and additional storage costs should be clearly communicated with the HRCE Personnel on a timely manner to ensure an amicable solution can be agreed between the HRCE and the vendor/contractor. The HRCE will not be liable for any direct or indirect loss incurred due to a pandemic.

The Terms and Conditions of the RFP Package, including but not limited to the Contract Type and Supplementary Conditions have been modified.

It is the Proponent's Responsibility to review all sections of the RFP prior to submitting a Proposal/Bid.

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SPECIFICATIONS 100 pages

FBM Architecture Ltd.

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ASBESTOS SURVEY 10 pages

ASBESTOS MANAGEMENT PROGRAM 40 pages

HRCE HOT WORK POLICY AND PERMIT.....10 pages

END OF DOCUMENT 1 Page

SECTION 00 00 15 - DESCRIPTION OF WORK & LIST OF DRAWINGS

1. General

- 1.1 The work of this contract includes the provision of all materials, labour and equipment necessary to complete the **Exterior Envelope Renewal at Harrietsfield Elementary**, to remove the existing exterior wall assemblies and materials in areas as noted on the drawings and specifications prepared by **FBM Architecture Ltd.**
- 1.2 It is the intent of the Halifax Regional Centre for Education (HRCE) to have all work completed, to the point of Ready-for-Takeover, prior to **January 30, 2026**. It is expected that a timely award of this contract will enable the Contractor to facilitate shop drawing review and ordering of materials to allow commencement of work immediately after contract execution.
- 1.3 The whole of the work shall agree in all particulars with the levels, measurements and details contained in the drawings accompanying this specification and with such other drawings or information as may from time to time be supplied by the HRCE or may be supplied by the Contractor and reviewed by the HRCE.
- 1.4 In relation to the hours of work: Work for the HRCE is to be completed during hours when the schools are unoccupied, unless otherwise authorized in writing by the Project Manager (Operations Contact person) or designate. Hours of work shall comply with the local ordinances and bylaws for each site. (Refer Section 00 41 13, Section 3.7)

END OF SECTION

SECTION 00 05 00 - LIST OF CONSULTANTS

Owner: Halifax Regional Centre for Education
33 Spectacle Lake Drive
Dartmouth, NS B3B 1X7

Nancy Rideout, Purchasing Manager
Office: (902) 464-2000 ext 2222
nrideout@hrce.ca

Consultant: FBM Architecture Ltd.
101-5560 Cunard Street
Halifax, NS B3K 1C4

Shawn Doyle
Office: (902) 429-4100 ext 113
doyle@fbm.ca

END OF SECTION

SECTION 00 21 13 – INFORMATION FOR PROPONENTS

Invitation:

1. Proposal Call

- 1.1. The Halifax Regional Centre for Education (HRCE) will receive offers in the form of a two-file proposal from proponents which is signed and electronically received on or before the date and time specified on the cover sheet of this document. The email address to submit submissions and amendments is hrcetenders@hrce.ca. Both files should be submitted in Adobe (.pdf) format. If the electronic submission is larger than 20MB, proponents have the option of sharing files from google drive to hrcetenders@gnspe.ca. If you encounter difficulties kindly contact the HRCE Procurement team for further clarification.
- 1.2. Proposals received after the closing time will not be considered. The HRCE deems the submission date and time to be the email received date and time. Please allow sufficient time for your submission to be received by the HRCE before the 2pm close. Large files may require more time. Bidders are encouraged to submit their proposals early.
- 1.3. Proponents are to submit completed Request for Proposal (RFP) documents by email.

The technical submission electronic file should be named:

"Technical Submission_4278_Proponent Name".

The second file (Price Submission) should be named:

"Price Submission_4278_Proponent Name".

There must be no reference to the bid price within the technical submission.

Proponents can refer to item 11 in this section for more detailed submission instructions.

- 1.4. Proposals will be opened at the time indicated on the cover sheet of this document. Public openings are no longer held for any Tenders or RFPs relating to goods, services or construction for the HRCE. **The technical submission will be the only file opened during the RFP closing.** All proposal submissions are subject to evaluation after opening and before award of contract. The successful proponent and award amount will be posted on the Procurement Services website (<http://novascotia.ca/tenders/tenders/ns-tenders.aspx>) after award.

- 1.5. Amendments to the submitted offer will be permitted if received by email prior to bid closing and if endorsed by the same party or parties who signed and executed the offer.

If the amendment relates to the technical submission, the electronic file should be named
“Technical Submission Amendment_4278_Proponent Name”.

If the amendment relates to the price submission, the file should be named:

“Price Submission Amendment_4278_Proponent Name”.

The price amendment file submission should be the signed Price Amendment Form (Section 00 41 73) and shall not disclose either the original or revised total price.

- 1.6. Bid submissions **will not** be accepted by fax, mail, courier or hand delivery.

2. Intent

- 2.1. The intent of this Request for Proposals (RFP) is to obtain an offer to perform all work associated with ***RFP #4278, Exterior Envelope Renewal at Harrietsfield Elementary*** for a Stipulated Price Contract in accordance with the Contract Documents.
- 2.2. The HRCE will use CCDC-2, 2020 for this work. A copy of the Standard Construction Contract CCDC 2 – 2020 is available upon request and will form part of the contract documents.
- 2.3. The HRCE Supplementary General Conditions for the CCDC-2, 2020, applicable to this work is available for review under Section 0073 00 of the RFP document.
- 2.4. Ready-for-Takeover (RFT) of the project is to be achieved on or before **January 30, 2026**, provided the contract is awarded within fifteen (15) business days after the RFP closing.
- 2.4.1. If the contract is not awarded within fifteen (15) business days of closing, the Ready-for-Takeover Date will be extended by one (1) business day, for every business day that passes, until the contract has been awarded.
- 2.4.2. Receipt of the award letter by the successful contractor does not constitute approval to begin work on site.
- 2.5. The HRCE does not guarantee the award of all areas, phases or any portion thereof.
- 2.6. The HRCE reserves the right to award individual areas or phases to one contractor or between multiple contractors.
- 2.7. The HRCE reserves the right to reduce the scope of work if the stipulated bid amount exceeds the budget for the relevant project.

3. Scope of work

- 3.1. Refer to Section 00 00 15 – Description of Work and List of Drawings and Section 01 11 00 HRCE Summary of Work.

4. Availability

- 4.1. RFP documents are available for download on the HRCE website:
<https://www.hrce.ca/about-hrce/financial-services/tenders/tender-listing>
- 4.2. RFP documents are made available only for the purpose of obtaining offers for this project. Their use does not confer a license or grant for other purposes.
- 4.3. The HRCE is not responsible for accuracy of documents obtained from any other source.

5. Examination

- 5.1. RFP documents are provided to the Construction Association of Nova Scotia (CANS).
- 5.2. Upon receipt of RFP documents, proposers are to verify that documents are complete.
- 5.3. Bidders are responsible to retrieve all RFP documents from the HRCE website and fully review the RFP requirements prior to the preparation of a bid submission.

6. Clarification and Addenda

- 6.1. Proposers must notify the HRCE Procurement Contact identified on the cover page of this posting no less than **five (5)** working days before the RFP Closing regarding any questions, omissions, errors or ambiguities found in the documents. If HRCE considers that correction, explanation or interpretation is necessary, an addendum will be posted on the HRCE website.
- 6.2. Addenda will be issued no less than three (3) business days before the RFP closing date and will form part of the Contract Documents.
- 6.3. All RFP information must be confirmed by written addenda. The HRCE and its representatives shall not be bound by or be liable for any representation or information provided verbally. Information obtained by any other source is not official and will not bind the HRCE.
- 6.4. Proposers are to complete Price Submission Form (section 00 41 13) acknowledging each addendum that was issued.
- 6.5. Where the HRCE publishes an Addendum modifying the terms of the posting documents, or changing the Project or Contract Documents in any manner, the HRCE shall not be liable for any expense, cost, loss, or any form of damage or damages incurred or suffered; whether directly or indirectly, by any Supplier or any other person in connection with or in any way relating to or resulting from the publication of an Addendum, regardless of whether the publication occurs prior to or after a Supplier has submitted their bid submission.
- 6.6. All Addenda issued by HRCE shall become part of the Contract Documents, unless specifically excluded from the Contract Documents in writing. Addenda shall be allowed for in determining the total contract price.

7. Product/System Options

- 7.1.** Alternatives to specified products and systems will only be considered during the bidding period in the manner prescribed below.
 - 7.1.1.** Where the RFP documents stipulate a particular product, alternatives may be considered by the Consultant up to five (5) working days before the RFP closing date and time. Bidders must forward their written requests by email to nrideout@hrce.ca. Requests will be forward to the appropriate person(s) for review.
- 7.2.** The submission must provide sufficient information to enable the Consultant to determine acceptability of such products. Request for an alternate product/system must be accompanied with:
 - 7.2.1.** information about how the request affects other work in order to accommodate each alternate;
 - 7.2.2.** the dollar amount of additions to or reductions from the Price Submission, including revisions to other work.
 - 7.2.3.** A later claim by the bidder for an addition to the contract price because of changes in work necessitated by use of alternates shall not be considered.
- 7.3.** When a request to substitute a product is made and pursuant to consultation with the Consultant, HRCE may approve or disapprove the substitution. The bidder making the request will be notified of the HRCE's decision and if the alternate is approved, the HRCE will issue an addendum.
- 7.4.** Alternates must be submitted in the above manner; otherwise, they will not be accepted.

8. Mandatory Bidders' Site Meeting (Site Assessment)

- 8.1.** Bidders will be deemed to have familiarized themselves with the existing project site, working conditions and all other conditions which may affect performance of the Contract. No plea of ignorance of such conditions as a result of failure to make all necessary examinations will be accepted as a basis for any claims for extra compensation or an extension of time.
 - 8.1.1.** A mandatory bidders' site meeting has been scheduled as per the information on the cover sheet of this document. All bidders are required to attend. Representatives of HRCE and the Consultant will be in attendance.
 - 8.1.2.** Bidders must register their presence with the HRCE stating the name of the contractor they represent. Failure to attend and register will lead to non-acceptance of the proposal by HRCE. HRCE recommends that interested bidders ensure that their proposed subcontractors attend the mandatory site meeting.

9. Bidders Registration

- 9.1.** The successful contractor and sub-contractors must comply with the Nova Scotia Corporations Registration Act and/or Partnerships and Business Name Registration Act, or equivalent, before a contract is awarded.

10. Qualifications (Subcontractors/Other Tradespersons/Individuals)

- 10.1.** Bidders are fully responsible to the HRCE for the acts/omissions of subcontractors and of persons directly or indirectly employed or retained by them. Nothing contained in the contract documents shall create any contractual relation between any subcontractor and the HRCE. Subcontracting the contract shall not relieve the Bidder from any contractual obligations.
- 10.2.** Bidders must provide subcontractors with a copy of the RFP documents making subcontractors aware that the HRCE is not responsible for any payments to subcontractors, and that all actions, directions or claims are solely between the bidder and the subcontractor.
- 10.3.** The Contract, or any portion thereof, shall not be assigned nor sub-contracted without the prior written approval of HRCE, which approval may be withheld in the HRCE's sole discretion. When sub-contracting, successful bidder(s) must be prepared, if requested, to provide copies of billings from subcontractors.
- 10.4.** Successful bidder(s) shall only use additional subcontractors during the course of the contract with the prior written approval of the HRCE.
- 10.5.** The successful bidder(s) shall not re-assign the role of Project Manager to another individual other than the proposed Project Manager as indicated in the technical submission, without prior written approval from the HRCE.
- 10.6.** The successful bidder(s) shall at all times enforce strict discipline and good order among their employees and subcontractors and shall avoid any unfit person or any person not skilled in the work assigned to the employee.
- 10.7.** HRCE reserves the right to reject a proposed sub-contractor for a reasonable cause.
- 10.8.** Refer to GC 3.6 of CCDC-2020.

11. PROPOSAL SUBMISSION

11.1. RFP Proposal Package - A complete proposal package is comprised of the elements below:

11.2. Technical Submission and Price Submission - General

- 11.2.1.** Each proposal shall include a signed technical submission file and a signed price submission file, clearly labelled as previously instructed in Section 00 21 13, item 1.3.
- 11.2.2.** Both the Technical Submission files, and the separate Price Submission file, shall be submitted simultaneously.
- 11.2.3.** The Technical Submission file contents must not contain any reference to the bid price being offered for this project.
- 11.2.4.** The email subject line or body must identify the name of the proponent/company and the RFP name and number.
- 11.2.5.** Proponents shall be solely responsible for the delivery of their proposals in the manner and time prescribed.

11.3. Technical Submission Contents

- 11.3.1.** Technical submissions shall be submitted in a legible format, not to exceed 20 pages. Submissions will be on the proponent's letterhead and shall contain an authorized signature. Proposals shall be submitted in English and shall be specifically prepared to meet the requirements of this project.

Total RFP Scoring:

Phase A – Technical Score	30 Points
Phase B – Pricing Score	70 Points
Phase C - Total RFP Score	100 Points

The technical submission response shall be organized into four sections:

Section I.	Project Experience and References
Section II.	Team Composition
Section III.	Management of Project Specific Risk
Section IV.	Schedule of Work

I. PROJECT EXPERIENCE AND REFERENCES.

The proponent is required to provide a detailed summary of their company's experience within the past sixty (60) months, by describing three (3) Exterior Envelope Renewal projects for an educational/commercial institution.

These projects should be within a 100 km radius of the Halifax Regional Municipality. These projects should be similar in nature, complexity and value to the requirements specified in this RFP (see Section 00 00 15).

If a proponent has completed projects for the HRCE, they are required to include the two most recent HRCE projects in this section (regardless of the date completed). It is the bidder's responsibility to source HRCE project information requested in this section.

Please note if the proponent fails to include relevant HRCE projects, this will negatively impact their technical score. **If a proponent has not completed prior work (at any time) for the HRCE, then they may select projects of their choosing within the other stipulated parameters.**

> For each of the three projects listed, the proponent is asked to provide:

- 1) the company name,
- 2) a brief description of the project,
- 3) the name of the project manager,
- 4) the dollar value of the project.
- 5) A reference contact name and title for this project, and
- 6) their email and phone number.

For HRCE projects, please provide the HRCE Project Manager's name; prior consent is not required.

Please ensure that non-HRCE references are aware they will be contacted, and that prior consent to be a reference was obtained.

RFP Scoring for this section:

SECTION I. PROJECT EXPERIENCE, BASED ON REFERENCE FEEDBACK		
Project 1	Project met budget and schedule.	2.00
	Good quality work and product.	1.00
	Well managed project and good communications.	2.00
Total Points Available for this Project		5.00
Project 2	Project met budget and schedule.	2.00
	Good quality work and product.	1.00
	Well managed project and good communications.	2.00
Total Points Available for this Project		5.00
Project 3	Project met budget and schedule.	2.00
	Good quality work and product.	1.00
	Well managed project and good communications.	2.00
Total Points Available for this Project		5.00
Total Points Available for Section I.		15.00

II. TEAM COMPOSITION.

The proponent is required to identify the key personnel who will be assigned to this project, these key personnel must remain with the project until completion. Please provide each employee's name, title/role, and years of related experience.

Proponents are required to provide a detailed resume for the proposed Project Manager outlining professional qualifications and years of experience.

Please indicate the percentage of their time that will be committed to this project.

An example of a time commitment for this project could be:

Commitment	Key Personnel
100%	Foreman
50%	Site Supervisor
20%	Project Manager

RFP Scoring for this section is:

SECTION II. TEAM COMPOSITION	Score
Does the Project Manager have a minimum of 3 years of relevant experience?	2.00
Was a listing of key team members provided?	1.00
Was the percentage of commitment indicated and adequate?	2.00
Total Points Available for Section II.	5.00

III. MANAGEMENT OF PROJECT SPECIFIC RISK

Proponents shall identify a minimum of three (3) risks associated with this specific project. Risks that their company could be faced with related to the scope of work for this project. Proponents shall state the risk, risk mitigation strategy, responsible parties, and the impact to schedule or budget.

An example of a Project Specific Risk could be:

Risk Register Example			
Risk	Mitigation	Responsibility	Impact
Specified materials have long lead times.	1. Expedite delivery if available. 2. Source alternative equivalent materials that are readily available.	Contractor. Client and Consultant approval required.	Expedited delivery or alternative materials may increase cost and impact budget. Without mitigation the schedule will be impacted.

Standard safety risks covered by Safe Work Practices are not to be referenced here. The HRCE is looking for assurances that risks identified through the mandatory site meeting are identified and will be mitigated, and that potential delays or other risks are disclosed in the proposal.

RFP Scoring for this section is:

SECTION III. MANAGEMENT OF RISKS ASSOCIATED WITH THIS SPECIFIC PROJECT		Score
Did the proponent detail the 3 Project Specific Risks with mitigation strategies?		3.00
Are risk management responsibilities clearly identified and assigned?		1.00
Were appropriate risk impacts provided for the 3 stated risks?		1.00
Total Points Available for Section III.		5.00

IV. SCHEDULE OF WORK

Please provide a Gantt Chart that includes an appropriate amount of detail around the planning and scheduling needs for this project. The Gantt Chart should contain all the key activities and align with the work schedule. A successfully prepared Gantt Chart provides a clear visual representation of how the project and required tasks will be completed.

If the Ready for Takeover Date cannot be met, please communicate this to procurement as an RFI well before RFP close.

The HRCE expects to award this work within 15 days of close. Please ensure that the proposed schedule of work aligns with that timeframe.

RFP Scoring for this section is:

SECTION IV. SCHEDULE OF WORK	Score
Does the Gantt Chart include all required components? Is the schedule reasonable?	2.00
Does the schedule indicate project completion <u>before</u> the Ready for Takeover date? <i>If the Ready for Takeover date cannot be met, please submit a RFI prior to RFP close.</i>	3.00
Total Points Available for Section IV.	5.00

11.4. Price Submission Contents

- 11.4.1** The Price Submission is to be submitted on the forms provided by the HRCE (Section 00 41 13 – Price Submission Form). These forms are to be completed in full, with an authorized signature and corporate seal as applicable. The completed form shall be without interlineations, alterations or erasures.

Proponents are advised that the HRCE may request original documents be sent to the HRCE office for further review. Price submissions sent by fax, mail or hand delivered will not be accepted.

- 11.4.2** The pricing details are to be clearly indicated. The total contract price in both numbers (dollars and cents) and written words must be entered. Should there be a discrepancy between the two, the written words shall prevail.

- 11.4.1.** The executed pricing offer is to be submitted on the forms **together with a scanned copy of the required bid security** by email.

- 11.4.2.** Improperly completed information, and/or irregularities in the bid security, may be cause to declare the submission non-compliant.

The omission of bid security from the bid submission will result in the submission being deemed as non-compliant (Refer Section 14.1.10).

11.5. Proposal Evaluation

11.5.1. Evaluation Process – Compliant proposals will be evaluated, first during Phase A, and those meeting the minimum qualifying score under Phase A will then be evaluated in Phase B, with a final score determined in Phase C.

Phase A – Technical Score	30 Points
Phase B – Pricing Score	70 Points
Phase C - Total RFP Score	100 Points

11.5.2. Proposals that do not meet the minimum qualifying score for Phase A will not be given further consideration.

11.5.3. Proposals will be evaluated and scored by an evaluation team comprised of a minimum of three (3) representatives of the HRCE. The degree to which a proposal meets the proposal requirements will be determined at the sole discretion of the HRCE evaluation team.

11.5.4. Phase A – Technical Submission – The Technical Submission for compliant proposals will be evaluated using the evaluation criteria set out in the table below. Scores will be recorded for each criterion (rounded to two (2) decimal points) and a total qualifying score will be determined.

Refer 11.3.1	Phase A - Evaluation Criteria Technical Submission	Score
Section I.	Project Experience and References	15.00
Section II.	Team Composition	5.00
Section III.	Management of Project Specific Risks	5.00
Section IV.	Schedule of Work	5.00
Total Phase A - Potential total score - Technical Submission		30.00
Minimum score needed to pass technical		15.00

A minimum qualifying score of 15.00 points is required in Phase A for the proposal to be given further consideration.

All technical submissions that have met the minimum qualifying score will proceed to Phase B - Price Submission.

Technical submissions that score below the minimum qualifying score will not proceed further in the RFP evaluation process.

11.5.5. Phase B - Price Submission - Price Submission files for proposers whose Technical Submission have received fifteen (15.00) points or greater will be opened.

The Price Submission will have a weight of seventy (70.00) points.

Price submissions will be evaluated, and a Phase B score will be assigned to each proposer by using a proximity to lowest price method. In this method, proposers will be awarded points based on how close their total price submitted compares with the lowest cost of all total submissions.

Price Submissions will be Evaluated based on the Proposer's Lump Sum Price.

For example:

Formula: Price Score = % value of score x (Low bid ÷ Your bid)

Example for calculation: Bid Pricing Received

Company P	Company Q	Company R	Company S	Company T
\$115,000	\$135,000	\$185,000	\$165,000	\$180,000

Calculation of Pricing Score for Company S:

Phase B Score = 70 points x (\$115,000 ÷ \$165,000) = 48.79 points

The Total Score (Phase C) will be calculated by adding together Phase A + Phase B scores.

11.5.6. The proposer who has the highest **TOTAL SCORE** (Phase C calculation), will be deemed to be the successful proposer, subject to other provisions herein, including Section 16.5.

Phase A – Technical Score	30 Points
Phase B – Pricing Score	70 Points
Phase C - Total RFP Score	100 Points

12. Conditions of the RFP Process

12.1. Proposers shall take full cognizance of content of all Contract Documents in preparation of their proposal. Section 00 41 13 – Price Submission Form, Subsection 5.0 references a complete list of Contract Documents.

13. Amendment or Withdrawal of Proposals

- 13.1.** Proposal packages may be **withdrawn** from the RFP process in writing by email notification sent to the submission email address, prior to date and time of closing.
- 13.2.** As previously stated in Section 00 21 13, item 1.6 - Amendments to the submitted offer will be permitted if received by email prior to the RFP closing time and if endorsed by the same party or parties who signed and executed the offer. If the amendment relates to the technical submission, it must be labeled "Technical Submission Amendment" along with the RFP number of the project and the company name. If the amendment relates to the price submission, it must be labeled "Price Submission Amendment" along with the RFP number of the project and the company name. The price amendment file must include the signed "Price Amendment Form" (Section 00 41 73).
- 13.3.** A single page Price Amendment Form is provided immediately following the Price Submission Forms (Section 00 41 73).
 - 13.3.1.1.** The Price Amendment Form provided is the standard master form for submission of any price amendments for this project.
 - 13.3.1.2.** The Price Amendment Form must be copied and completed, as directed, for any price amendments submitted.
- 13.4.** Price amendments shall not disclose either original or revised total price.

14. Proposal Ineligibility (Reason for Rejection)

- 14.1.** HRCE may reject a proposal which has been received prior to the closing time where:
 - 14.1.1.** The two file (electronic) system (Technical Submission and Price Submission) is not followed.
 - 14.1.2.** The price submission is not submitted on the required forms (Section 00 41 13) included herein.
 - 14.1.3.** The proposal is submitted by facsimile or regular mail or hand delivery.
 - 14.1.4.** There are omissions of information that the HRCE in its sole discretion deems to be significant.
 - 14.1.5.** The technical submission or price submission form is not signed as required.
 - 14.1.6.** The proposal has conditions attached which are not authorized by the invitation to bid.
 - 14.1.7.** The proposal fails to meet one or more standards specified in the invitation to bid.
 - 14.1.8.** All addenda have not been acknowledged.
 - 14.1.9.** Any other defect which, in the opinion of the HRCE brings the meaning of the proposal into question.

14.1.10. The required bid security is not provided within the Price Submission file.

14.1.11. Proponent failed to attend bidders' mandatory site meeting.

14.1.12. Proponent failed to list relevant HRCE project(s) in their technical submission.

15. Communications Affecting Bids

15.1. Transmissions, including, but not limited to facsimile transmission:

15.1.1. The technical submission or price submission forms submitted by mail, fax or courier will not be accepted.

16. Right to Accept or Reject any Proposal

16.1. The HRCE reserves the right to reject any proposal in its sole and absolute discretion for any reason whatsoever and the HRCE will not necessarily accept the lowest bid.

16.2. The HRCE specifically reserves the right to reject all proposals if none are considered to be satisfactory in the HRCE's sole and absolute discretion and, in that event, at its option, to call for additional proposals.

16.3. Without limiting the generality of any other provision herein, the HRCE reserves the right to accept or reject any proposal in accordance with item #14 above (Proposal Ineligibility).

16.4. Notwithstanding the above, the HRCE shall be entitled, in its sole and absolute discretion, to waive any irregularity, informality or non-conformance with these instructions in any proposal received by the HRCE. The HRCE reserves the right to reject any or all proposals, or to accept any proposal, or portion thereof, deemed in its best interest.

16.5. In the event that more than one proponent achieves an identical final total score within two decimal places in Phase C, the HRCE will flip a coin to determine the successful contractor.

16.6. No term or condition shall be implied, based upon any industry or trade practice or custom or in a practice or policy of the HRCE or otherwise, which is inconsistent or conflicts with the provisions contained in these instructions.

17. Right to Cancel Competition/No Award

17.1. Issuing a RFP/RFT implies no obligation on HRCE to accept any submission, or a portion of any submission. The lowest or any RFP/RFT submission will not necessarily be accepted.

17.2. Without limiting the generality of the foregoing, an RFP/RFT may be cancelled in whole or in part by HRCE in its sole discretion, whether before or after the time for RFP/RFT submissions has closed, when:

17.2.1. The RFP/RFT submission price exceeds the funds allocated for the purchase;

17.2.2. There has been a material change in the procurement requirements after the RFP/RFT has been issued;

- 17.2.3.** Information has been received by HRCE after issuance of the RFP/RFT that HRCE believes has materially altered the procurement or the need of HRCE for the procurement; or
 - 17.2.4.** There was insufficient competition in order to provide the level of service, quality of goods or pricing required.
- 17.3.** If no compliant RFP/RFT submission is received in response to an RFP/RFT, the HRCE reserves the right to enter into negotiations with one or more suppliers in order to complete the procurement or to reject all Bids and re-issue the RFP/RFT on new or modified RFP/RFT Documents.
- 17.4.** HRCE will be the sole judge of whether there is sufficient justification to cancel any RFP/RFT.
- 17.5.** No action or liability will lie or reside against HRCE in its exercise of its rights under this section

18. Construction Contract Guidelines

- 18.1.** The printed policies of the Nova Scotia Construction Guidelines dated May 18, 2006 (or latest revisions) are applicable to these RFP documents.

19. Submission and Security Forms – Signatures

- 19.1.** All Price Submission forms, bid security forms and performance assurance forms **must** bear the Bidder's original signature and name HRCE as the insured.

20. Bid Security

- 20.1.** Proponents must submit within the sealed Price Submission file, one of the following: bid security in the form of a certified cheque, Irrevocable Letter of Credit, or Bid Bond on CCDC Form 220, in the amount of ten percent (10%) of the Bid Price made payable to or naming HRCE (as obligee). This bid security **must** accompany the Price Submission as an electronic file. HRCE will request an original hard copy from the successful proponent as required.
- 20.2.** Where bid bond is provided as bid security:
 - 20.2.1.** The bond must be provided on the standard CCDC Bid Bond Form (latest version) in the amount of not less than ten percent (10%) of the Bid Price.
 - 20.2.2.** The bond must be submitted by the general contractor bidder, signed and sealed by the principal (Contractor) and Surety and shall be with an established Surety Company satisfactory to and approved by the HRCE.
 - 20.2.3.** The cost of providing the Bid Bond must be included in the Bid Price.
 - 20.2.4.** A legible scanned copy of the bid bond or an electronic bid bond shall be submitted with the bid via email. If requested by the HRCE, the vendor will provide the original bid bond without delay.

20.3. Where a certified cheque or a bank draft is provided as bid security:

20.3.1. The certified cheque or bank draft must be endorsed in the name of HRCE, for a sum not less than ten percent (10%) of the amount of the Bid Price.

20.3.2. The cost of providing the certified cheque or bank draft must be included in the Bid Price.

20.4. Where the Irrevocable Standby Letter of Credit is used as bid security:

20.4.1. The letter must be endorsed in the name of HRCE, for a sum not less than ten percent (10%) of the Bid Price

20.4.2. The Irrevocable Standby Letter of Credit shall be issued by a certified financial institution subject to the Uniform Custom and Practices for Documentary Credit (1993 revision or latest revision), International Chamber of Commerce (Publication No. 500).

20.4.3. The cost of providing the letter must be included in the Bid Price.

20.4.4. **A legible scanned copy of the bid bond or an electronic bid bond can be submitted with the bid via email. If requested by the HRCE, the vendor is required to provide the original bid bond without delay.**

20.5. Return of Bid Security:

20.5.1. The bid security of the unsuccessful proponents will be returned to them after the contract has been signed, or previous to such time, at the discretion of HRCE.

20.5.2. If no contract is awarded, all bid security will be returned.

21. Contract Security (Performance Assurance) – Required for contracts valued over \$100,000

21.1. The performance assurance forms must bear the bidder's original signature and name HRCE as the insured.

21.2. The successful contractor shall maintain performance assurance in force for a period of not less than twelve (12) months after Ready-for-Takeover is achieved.

21.3. Performance Assurance must be endorsed as specified for bid security.

21.4. Should it become apparent that the final cost of the project will exceed the total amount payable by more than 20%, the bidder shall arrange to have their bonds reissued based on the projected final cost.

21.5. Section 00 72 13 – General Conditions GC11.2 and Section 00 73 00 – Supplementary General Conditions for form of Contract Security. Proponents should reference the project documents for the amount of Contract Security and the alternate type of Contract Security if applicable.

21.6. Performance Assurance must be submitted as one of the following:

21.6.1. Where a Bid Bond was used as bid security:

- 21.6.1.1.** Within ten (10) days after notification of award of the Contract, the successful contractor must provide a Performance Bond and a Labour & Material Payment Bond, each in an amount equal to fifty percent (50%) of the amount of the Contract, naming HRCE.
- 21.6.1.2.** Performance Bond and Labour and Material Payment Bonds, submitted by the bidders, shall be provided at the expense of the bidder and shall be with an established Surety Company satisfactory to and approved by the HRCE.
- 21.6.2.** Where a certified cheque or bank draft is used as Contract Security:
- 21.6.2.1.** The certified cheque or bank draft submitted during the bid period will be cashed and the amount retained by the HRCE shall serve as Performance Assurance, including the payment of all obligations arising under the Contract.
- 21.6.2.2.** The value of the certified cheque or bank draft will be retained in lieu of the Performance Bond and Labour and Material Bonds, providing that, at Contract award, the successful contractor shall supplement their certified cheque or bank draft to maintain an amount of ten (10%) of the total amount payable (Contract Price plus HST) under the contract.
- 21.6.2.3.** The amount remaining will be returned without interest after a period of not less than twelve (12) months after Ready-for-Takeover is achieved.
- 21.6.2.4.** Where certified cheque or bank draft is used as Performance Assurance, the cost of providing the certified cheque or bank draft in the Contract price.
- 21.6.3.** Where an Irrevocable Standby Letter of Credit is used as Contract Security:
- 21.6.3.1.** The Irrevocable Standby Letter of Credit submitted during the bid period will be retained by the HRCE and shall serve as performance assurance, including the payment of all obligations arising under the contract. The Irrevocable Standby Letter of Credit shall be issued by a certified financial institution subject to the Uniform Customs and Practices for Documentary Credit (1993 revision) International Chamber of Commerce (Publication No. 500).
- 21.6.3.2.** Where an Irrevocable Standby Letter of Credit is used as Performance Assurance, the cost of providing this letter should be included in the Contract Price. The contractor shall provide to the HRCE

documentation throughout the duration of the contract that the Irrevocable Standby Letter of Credit remains in full effect at all times as specified.

21.6.3.3. Upon expiry of the Irrevocable Standby Letter of Credit, a separate Irrevocable Standby Letter of Credit shall be provided for work requiring extended warranties for such amounts as are required by the contract.

21.6.3.4. The Irrevocable Standby Letter of Credit is to be in effect for a period of not less than twelve (12) months after the Ready-for-Takeover is achieved.

22. Insurance

22.1. Proposers shall refer to project documents for the amount of insurance, the duration of coverage and alternate type of insurance; if applicable.

Section 00 72 13 -General Conditions of Contract,
Section GC 11.1 – Insurance, and
Section 00 73 00 – Supplementary General Conditions for form of Insurance.

22.2. The contractor shall carry such insurance as is required to protect the contractor, any sub-contractor, the HRCE, their agents and employees from all claims which may arise from the operations under this contract. The amounts of such insurance shall not be less than 22.3 below.

22.3. The General Contractor shall secure and maintain, at its expense, during the term of the insurance:

22.3.1. Wrap-Up Liability insurance must insure the general contractor(s) and all sub-contractors on this project:

22.3.1.1. including but not limited to, products liability and completed operations, contractual liability, owners and contractors' liability, attached machinery extension endorsement, and independent contractor, for a combined single limit of no less than \$5,000,000 (five million dollars) per occurrence.

22.3.1.2. Wrap-Up Liability insurance is to include 24 months (2 years) of completed operations.

- 22.3.2.** Commercial Auto Liability insurance covering all owned, non-owned and hired vehicles for a minimum combined single coverage of \$2,000,000 (two million dollars) per occurrence.
- 22.3.3.** Builders Risk: All risks in the amount of the contract Stipulated Bid Price. Insurance requirements as stipulated in the CCDC 2-2020.
- 22.3.4.** Workers' Compensation to meet statutory requirements and/or Employers Liability, with limits of not less than \$2,000,000 (two million dollars).
- 22.3.5.** Contractors Pollution Liability Insurance limits of not less than \$2,000,000 (two million dollars) per occurrence
- 22.4.** Primary Insurance: The Contractor agrees that the insurance as required shall be primary and non-contributory.
- 22.5.** No Limitation: The Contractor is responsible for determining whether the minimum insurance coverage amounts contained in this RFP are adequate to protect its interests. These minimum coverage amounts do not constitute limitations upon Supplier's Liability.
- 22.6.** Endorsements – For the policies in item 22.3 above, there shall contain an endorsement naming the Halifax Regional Centre for Education and its affiliates as Additional Insured, and eliminating and removing any exclusion of liability for:

 - 22.6.1.** injury, including bodily injury and death to an employee of the insured or of the Halifax Regional Centre for Education, or
 - 22.6.2.** any obligation of the insured to indemnify, hold harmless, defend, or otherwise make contribution to the Halifax Regional Centre for Education because of damage arising out of injury, including bodily injury and death, to an employee of Halifax Regional Centre for Education.
- 22.7.** The Contractor shall provide a certificate of insurance evidencing the above prior to work being performed. The HRCE also requires a complete copy of the Builder's Risk and Wrap-Up Liability policies, in addition to the Certificate of Liability Insurance.
- 22.8.** Furthermore, HRCE must receive, in writing, at least thirty (30) days' notice of cancellation or modification of the above insurances. All insurance policies or certification documents shall specify coverage being applicable to this contract. The

Contractor shall not do or omit to do or suffer anything to be done or omitted to be done which will in any way impair or invalidate such policy or policies of insurance.

- 22.9.** Insurance documents (certificate and policies) shall be provided to the Purchasing Department within the timeframe indicated on the award letter. These documents are required before a purchase order will be issued. Work is not authorized and shall not commence until receipt of the purchase order.

23. Proof of Competency of Proponent

- 23.1.** Any bidder may be required to furnish evidence satisfactory to the owner that he and his proposed sub-contractors have sufficient means and experience in the types of work called for to assure completion of the contract in a satisfactory manner.

23.1.1. The successful contractor must be a member in good standing with CRCA, RCANS or NBRCA; and Nova Scotia Construction Safety Association or approved recognized association or program.

23.2. Proposal Signing

23.2.1. The Technical Submission and the Price Submission form must be signed and under seal (as applicable) by a duly authorized signing officer(s) in their normal signatures.

23.3. Contract Time

23.3.1. The bidder, in submitting an offer, agrees to achieve Ready-for-Takeover of the work by the date indicated in the contract documents.

24. Offer Acceptance / Rejection

24.1. Duration of offer

24.1.1. Proposals shall remain open to acceptance and shall be irrevocable for a period of ninety (90) days after the RFP closing date.

24.2. Award/Selection/Acceptance of Offer

24.2.1. In the evaluation of a proposal, HRCE will consider, but not be limited to, the following criteria:

24.2.1.1. Compliance with proposal requirements

24.2.1.2. Proposal Evaluation Criteria as stated in Section 11.5

24.2.2. The Owner's evaluation of any and all proposals will be final

- 24.3.** After acceptance by HRCE, the successful bidder shall be notified in writing of acceptance of the bid by way of an award letter.

25. Agreement

- 25.1.** After acceptance, the HRCE and the successful proponent will enter into a CCDC-2, standard form of contract for the execution of the work.
- 25.2.** A purchase order will be issued to the successful bidder once the contract has been signed and executed.

26. Post Award Submissions

- 26.1.** Upon receipt of the award letter, the successful contractor will provide the following documents within five (05) business days:

- 26.1.1.** A current Certificate of Recognition or Letter of Good Standing - The Contractor will supply a Certificate of Recognition issued jointly by the Workers' Compensation Board of Nova Scotia and an occupational health and safety organization approved by the Workers' Compensation Board of Nova Scotia (such as the Nova Scotia Construction Safety Association). These approved organizations are currently listed on the Workers' Compensation Board of Nova Scotia website (www.wcb.ns.ca). The contractor shall remain in good standing for the duration of the contract.

The Contractor shall supply the following:

- 26.1.1.1.** Worker's Compensation Coverage – The Contractor shall supply a clearance letter from the Worker's Compensation Board of Nova Scotia, indicating the Contractor is assessed and in good standing;
 - 26.1.1.2.** Certificates of good standing with CRCA (Canadian Roofing Contractors Association) and RCANS (Roofing Contractors Association of Nova Scotia);
 - 26.1.1.3.** All required contract security and insurance documentation;
 - 26.1.1.4.** A completed Schedule of Values (see Section 01 37 00);
 - 26.1.1.5.** A completed Safety Plan; and,
 - 26.1.1.6.** A detailed listing of subcontractors to be used.
 - 26.1.2.** In the event that any such certification during the term of the contract expires, the obligation remains with the Contractor to provide the updated required certificates.
 - 26.1.2.1.** The Contractor and subcontractors (if applicable) shall remain in good standing for the duration of the contract.

27. Taxes

- 27.1.** The General Conditions of the Contract state that the Contractor is to pay all Harmonized Sales Tax (HST).

- 27.2. The HRCE is not exempt from HST. As a result, the aggregate amount of the bid for contracts is subject to HST; however, **prices submitted shall not include HST.**
- 27.3. The HST payable by the HRCE will be added as a separate item during the processing of progress payments and therefore **HST will not appear as a cost in the aggregate amount of the bid amount.**
- 27.4. Proponents are advised that they may be eligible to claim an Input Tax Credit (ITC) for a portion of the HST paid in relation to the contract requirement of the Government of Canada.
- 27.5. Proponents are to note that prices indicated on the Price Submission Form and the amendments to the Price Submission Form shall not include Provincial Sales Taxes, the Federal Goods and Services Tax or the Harmonized Sales Tax.
- 27.6. Refer to CCDC-2 (Section 00 72 13) and Supplementary General Conditions (Section 00 73 00).

28. Proponent Debriefing

- 28.1. HRCE will, if requested by a proponent within fifteen (15) days of notice of RFP award, arrange a debriefing for the purpose of informing the bidder why their proposal was not selected. At least two (2) HRCE staff shall attend the de-briefing.

The purpose of the de-briefing will be to discuss the proponent's scoring, answer questions and identify any weak areas in the proponent's submission in order for the proponent to improve future bid submissions. HRCE will not divulge details contained in any proponent's proposal with other proponents or overall ranking.

29. Purchase Orders

- 29.1. The purchase order will be issued by the HRCE Purchasing Department once the CCDC-2 Contract Documents have been fully executed by all parties.

30. Invoices

- 30.1. The purchase order number and HST number shall be noted on any/all invoices related to all work performed under this contract.
- 30.2. Applications for progress payments should be submitted to HRCE's consultant and cc'd to operations-invoices@hrce.ca as well as HRCE's Project Manager (Operations Contact) identified on the RFP cover page.

END OF SECTION 00 21 13

SECTION 00 31 26 – EXISTING HAZARDOUS MATERIALS INFORMATION

The following report is attached for bidders' information and reference:

**ASBESTOS SURVEY, Harrietsfield Elementary School
1150 Old Sambro Road Harrietsfield, NS B3V 1B1
Prepared by Maritime Testing (1985) Limited; on March 4, 1999.**

END OF SECTION 00 31 26

SECTION 00 41 13 – PRICE SUBMISSION FORM

1. Salutation:

To: HALIFAX REGIONAL CENTRE FOR EDUCATION
33 SPECTACLE LAKE DRIVE, DARTMOUTH, NS B3B 1X7
ATTN: NANCY RIDEOUT, PURCHASING MANAGER

For: #4278 Exterior Envelope Renewal - Harrietsfield Elementary

Organization Name:	
Street Address:	
Email Address:	
Telephone:	
Authorized Signing Authority:	
Position Title:	

2. Proponent Declares:

- 2.1. That this submission was made without collusion or fraud.
- 2.2. That the proposed work was carefully examined.
- 2.3. That the Proponent is familiar with local conditions.
- 2.4. That Contract Documents and Addenda were carefully examined.
- 2.5. That all the above were taken into consideration in preparation of this RFP.

3. Proponent Agrees:

- 3.1.** To provide all necessary equipment, tools, labour, incidentals and other means of construction to do all the work and furnish all the materials of the specified requirements which are necessary to complete the work in accordance with the Contract and agrees to accept, therefore, as payment in full the Lump Sum Price stated in Subsection 6 hereunder.
- 3.2.** The have carefully examined the site of the work described herein; have become familiar with local conditions and the character and the extent of the work; have carefully examined every part of the proposed Contract and thoroughly understand its stipulations, requirements and provisions.
- 3.3.** The have determined the quality and quantity of materials required; have investigated the location and determined the source of supply of the materials required; have investigated labour conditions; and have arranged for the continuous prosecution of the work herein described.
- 3.4.** To be bound by the award of the Contract and if awarded the Contract on this bid price, to execute the required contract within ten (10) days after notice of award.
- 3.5.** They have noted that the Harmonized Sales Tax is excluded from the "Contract Price".
- 3.6.** The Contractor's employees shall always report to the main office of a school, indicate who they are, and state their purpose on site prior to starting any work in the school.
- 3.7.** *To the hours of work, defined as: Work for the HRCE is to be completed during hours when schools are unoccupied, unless otherwise authorized in writing by the Project Manager (Operations Contact person) or designate. Hours of work shall comply with local ordinances and bylaws for each site.*
 - 3.7.1.** No work shall be conducted on weekends or statutory holidays without specific written approval from the Operations Manager or designate.
 - 3.7.2.** In the event that work is requested by HRCE during hours when schools are occupied, the work will be limited to work that is not disruptive to the school. There shall be no mechanical removals, no drilling, screwing or torch work during occupied hours without prior written approval from HRCE.

4. Owner Agrees

- 4.1.** To examine this proposal and in consideration, therefore, the proponent hereby agrees not to revoke this bid:
 - 4.1.1.** until some other proponent has entered into the Contract with the HRCE for the performance of the work and the supply of the materials specified in the notice inviting proposals; or in the Information to Proponents, or
 - 4.1.2.** until ninety (90) days after the time fixed in the Information to Proponents for receiving bids has expired, or

- 4.1.3.** Whichever first occurs; provided, however, that the Proponent may revoke this proposal at any time before the time fixed as indicated in Section 00 21 13, item 13.1.

5. Contract Documents include:

The HRCE will use CCDC-2, 2020 for this work. A copy of the Standard Construction Contract CCDC 2 – 2020 is available upon request and will form part of the Contract Documents.

The HRCE Supplementary General Conditions for the CCDC-2, 2020 application to this Work is available for review under Section 0073 00 of the RFP document.

- 5.1.1.** Cover Page
- 5.1.2.** Table of Contents – Section 00 00 10
- 5.1.3.** Description of Work & List of Drawings – Section 00 00 15
- 5.1.4.** List of Consultants – Section 00 05 00
- 5.1.5.** Information for Proponents – Section 00 21 13
- 5.1.6.** Price Submission Form – Section 00 41 13
- 5.1.7.** Price Amendment Form (if applicable) – Section 00 41 73
- 5.1.8.** Agreement Between Owner and Contractor (CCDC 2) – Section 00 52 00
- 5.1.9.** Definitions (CCDC 2) – Section 00 52 13
- 5.1.10.** General Conditions of the Stipulated Contract Price (CCDC 2) – Section 00 72 13
- 5.1.11.** Supplementary General Conditions – Section 00 73 00
- 5.1.12.** Specifications of Work (all applicable sections)
- 5.1.13.** Drawing(s) – as applicable
- 5.1.14.** Addenda issued by HRCE
- 5.1.15.** Post Bid Addenda issued by the HRCE, where applicable.
- 5.1.16.** Executed Contract

6. Price Submission - Contract Price:

6.1. The undersigned Proponent, having carefully read and examined the aforementioned Contract Documents prepared by the Consultant, for the Halifax Regional Centre for Education, hereby accepts the same as part and parcel of the Contract herein referred to, and having carefully examined the locality and site of works and having full knowledge of the work required and of the materials to be furnished and used, does hereby propose and offer to enter into a contract to perform and complete, the whole of the said works and provide all necessary labour, plant, tools, materials and equipment and pay all applicable taxes, as set forth and in strict accordance with the Specifications, Drawings and other Contract Documents and to do all therein called for on the terms and conditions and under the provisions therein set forth for the following:

6.2 LUMP SUM PRICE

The lump sum price provided in this Section represents the total price to complete all phases of work indicated, at all facades, in the building's entirety. The replacement of windows is to be included.

#4278 Exterior Envelope Renewal - Harrietsfield Elementary (All Phases)

_____/100 Dollars (\$_____)
(HST Excluded)

Contract Price to be completed in written form on the lines provided above, with cents expressed as numerical fraction of a dollar. Contract price to be completed in numerical form on the line bounded by parenthesis above, with cents expressed as a decimal of a dollar.

Price Submissions will be Evaluated based on the Proponent's Lump Sum Price.

WHERE THERE IS A CONFLICT, WRITTEN WORD WILL GOVERN.

Award will be subject to Budget Availability.

The HRCE reserves the Right to:

Award to one or more contractors who bid.

Accept bids on any or all sections of this work.

Reduce the Scope of Work if the Bid amount Exceeds the Available Budget.

6.3 INDIVIDUAL PRICE – PHASE A, PHASE B, AND PHASE C.

The lump sum price provided in Section 6.2 represents the total price to complete work related to all facades of the building, in its entirety. HRCE acknowledges that there are inherent costs savings and economies of scale achieved when awarding all wall sections to a single bidder.

In the event that partial award is required, please provide pricing per each individual section as listed below. Each price is to include all management costs (administration, mobilization, etc.) as required to perform the entirety of the work for that specific section. HRCE acknowledges that management costs are higher on a per section basis, compared to management costs associated with all sections priced as one lump sum.

The expectation is that the pricing provided below represents the entire price to complete that specific section, should it be the only section awarded. Each phase price is to include replacement of windows. A separate credit price, per phase, is to be provided, in the event that HRCE decides not to replace the windows. The pricing provided here will not be used in the calculation of the RFP scoring; see Section 6.2 Lump Sum Price. Please exclude HST.

PHASE A

Masonry and Lintel replacement:

_____ /100 Dollars (\$_____)

Window replacement:

_____ /100 Dollars (\$_____)

PHASE B

Masonry and Lintel replacement:

_____ /100 Dollars (\$_____)

Window replacement:

_____ /100 Dollars (\$_____)

PHASE C

Masonry and Lintel replacement:

_____ /100 Dollars (\$_____)

Window replacement

_____ /100 Dollars (\$_____)

7. Completion Date:

7.1. The proponent agrees to achieve Ready-for-Takeover on or before the following date:

7.1.1.1. **January 30, 2026**

7.1.1.2. The undersigned Proponent agrees, if awarded the Contract, to achieve the Ready-for-Takeover Date providing the contract is awarded within fifteen (15) business days of RFP closing time.

8. Addenda Acknowledgement

We have received and noted the following addenda:

Addendum #	Dated	# of Pages

Signature * The undersigned Proponent declares that this bid is made without connection to any other person(s) submitting pricing for the same work and is in all respects fair and without collusion or fraud.

RFP #4278 Exterior Envelope Renewal - Harrietsfield Elementary

SIGNATURE:

SIGNED AND DELIVERED
in the presence of:

Witness

CONTRACTOR

Company name

Signature of Signing Officer

Name and Title (printed)

Date

9. Acknowledgement of Student Safety

The Halifax Regional Centre for Education (HRCE) is directly responsible for the safety of its students and staff. Should contractors be required to work in or on school property while children are present, it is a **mandatory HRCE requirement** that contractors assign the work to employees and/or sub-contractors who do not have a criminal record and who are not listed on the Child Abuse Registry. Failure to comply with this requirement may result in immediate contract termination.

The HRCE reserves the right to demand, at any time, during the full term of the project a Criminal Record Check and/or a Child Abuse Registry Check, on any personnel authorized by the Contractor to be on HRCE work/school sites.

By signing below, you are confirming that you understand and will abide by this mandatory HRCE requirement.

Witness

Company name

Signature of Signing Officer

Name and Title (printed)

Date

END OF SECTION 00 41 13

SECTION 00 41 73 - PRICE AMENDMENT FORM
#4278 Exterior Envelope Renewal Elementary School

Note: to be completed and forwarded for each Price amendment prior to RFP closing time and date as detailed on the cover sheet of the RFP document and any applicable addenda.

Lump Sum Price Amendment – Section 00 41 13 Price Submission form, Article 6.1. Contract Price

Increase Price by		Decrease Price By	
Amount (excluding HST)	\$	Amount (excluding HST)	\$

It is the Proponent's responsibility to ensure the table above is legible.

Submitted by:

Company Name (please print as it appears on original RFP file)

Authorized Proponent's Name (please print as it appears on Price Submission Form)

Authorized Proponent's Signature

Date

END OF SECTION 00 41 73

SECTION 00 52 00 - AGREEMENT BETWEEN OWNER AND CONTRACTOR
CCDC 2 – 2020

(A copy of Section 00 52 00, Standard Construction Contract CCDC 2 – 2020 (5 pages) is available upon request, otherwise, will form part of the contract sets to the successful bidder)

END OF SECTION 00 52 00

SECTION 00 52 13 - DEFINITIONS
CCDC 2 - 2020

(A copy of section 00 52 13, Standard Construction Contract CCDC 2 – 2020 (2 pages) is available upon request, otherwise, will form part of the contract sets to the successful bidder)

END OF SECTION 00 52 13

SECTION 00 72 13 - GENERAL CONDITIONS
OF THE STIPULATED PRICE CONTRACT
CCDC 2 - 2020

(A copy of section 00 72 13, Standard Construction Contract CCDC 2 – 2020 (22 pages) is available upon request, otherwise, will form part of the contract sets to the successful bidder)

END OF SECTION 00 72 13

SECTION 00 73 00 - SUPPLEMENTARY GENERAL CONDITIONS CCDC2 – 2020

The Canadian Standard Construction Document for Stipulated Price Contract (CCDC 2, 2020 version), Definitions and General Conditions governing same, shall be used by the project. The following Supplementary General Conditions (the “**Supplementary Conditions**”) are intended to Supplement or Amend the General Conditions, and where conflicts occur, the Supplementary Conditions shall take precedence.

Where a General Condition or paragraph of the General Conditions of the Stipulated Price Contract is Deleted by these Supplementary Conditions, the numbering of the remaining General Conditions or paragraphs shall remain unchanged, and the numbering of the Deleted item will be retained, unused.

2 ARTICLE A-5 PAYMENT

Change 5.2.1 to delete the letter “s” from the word “rates”.

Change 5.2.1(1) to read: "1% per annum above the prime rate."

Delete 5.2.1(2) in its entirety.

Delete 5.2.2. in its entirety.

DEFINITIONS

Add the following defined term to the Definitions:

Submittals

Submittals are documents or items required by the Contract Documents to be provided by the Contractor, such as:

1. Shop Drawings, samples, models, mock-ups to include details or characteristics, before the portion of the Work that they represent can be incorporated into the Work; and
2. As-built drawings and manuals to provide instructions to the operation and maintenance of the Work.

3 GC 1.1 CONTRACT DOCUMENTS

Add to the end of subparagraph 1.1.6.2:

1.1.6.2 Except where the Consultant shall be indemnified as a third- party beneficiary as provided in subparagraphs 9.2.7.4, 9.5.3.4 and in 13.1.1.3.

Add subparagraph 1.1.4.1:

1.1.4.1 Notwithstanding GC 1.1.4, should one or more conflict exist between Contract Documents and any work is done without consulting the Consultant for correction, Additional information, or a finding, the Contractor shall assume full and sole responsibility for any Additional costs incurred related to the conflict(s).

4 GC 2.4 DEFECTIVE WORK

Add new subparagraphs 2.4.1.1 and 2.4.1.2:

2.4.1.1 The Contractor shall rectify, in a manner acceptable to the Owner and the Consultant, all defective work and deficiencies throughout the Work, whether or not they are specifically identified by the Consultant.

2.4.1.2 The Contractor shall prioritize the correction of any defective work which, in the sole discretion of the Owner, adversely affects the day to day operation of the Owner.

5 PART 3 EXECUTION OF THE WORK

6 GC 3.1 CONTROL OF THE WORK

Add new paragraphs 3.1.3 and 3.1.4:

3.1.3 Prior to commencing individual procurement, fabrication, and construction activities, the Contractor shall verify, at the Place of the Work, all relevant measurements and levels necessary for proper and complete fabrication, assembly and installation of the Work and shall further carefully compare such field measurements and conditions with the requirements of the Contract Documents. Where dimensions are not included or contradictions exist, or exact locations are not apparent, the Contractor shall immediately notify the Consultant before proceeding with any part of the affected work.

3.1.4 The Contractor shall make all reasonable efforts to ensure that the Work is carried out in a continuous manner. The Contractor shall not knowingly permit Construction Equipment and/or Products to be stored at the Place of Work when they are not being used in connection with or implemented into the Work, except in accordance with paragraph 3.7.7.1.

7 GC 3.6 SUBCONTRACTORS AND SUPPLIERS

Add the following paragraph 3.6.7:

3.6.7 A copy of the agreement between Contractor and any subcontractor(s) shall be provided to the Owner and the Consultant, if so requested.

8 GC 3.7 LABOUR AND PRODUCTS

Add the following paragraph 3.7.4:

3.7.4 The Contractor is responsible for the safe on-site storage of Products and their protection (including Products supplied by the Owner and other contractors to be installed under the Contract) in such ways as to avoid dangerous conditions or contamination to the Products or other persons or property and in locations at the Place of the Work to the satisfaction of the Owner and the Consultant. The Owner shall provide all relevant information on the Products to be supplied by the Owner.

Add the following paragraph 3.7.5:

3.7.5 The Contractor shall confine Construction Equipment, Temporary Work, storage of Products, waste products and debris, and operations of employees and Subcontractors to limits indicated by laws, ordinances, permits, or the Contract Documents and shall not unreasonably encumber the Place of the Work.

Add the following paragraph 3.7.6:

3.7.6 The Contractor shall maintain the Work in a safe and tidy condition and free from accumulation of waste products and debris.

Add the following paragraphs 3.7.7.1 and 3.7.7.2:

3.7.7 .1 The Contractor shall not permit Products or Construction Equipment to be stored at the Place of Work unless:

(i) the Products and/or Construction Equipment are used within fourteen (14) days of their arrival at the Place of Work; or

(ii) the Owner provides written permission for Products and/or Construction Equipment to be stored at the Place of Work, in which case the Contractor shall comply with the written instructions provided by the Owner in that regard, and said permission may be withdrawn by the Owner upon five (5) business days' notice, in which case the Contractor will be solely responsible for any costs, losses, or damages the Contractor incurs in connection the withdrawal of said permission;

.2 Notwithstanding any other provision of the Contract Documents, and subject only to the provisions of any Payment Legislation, the Owner shall not be liable to pay any amount greater than 25% of the actual cost of any Products and/or costs associated with Construction Equipment that is/are stored at the Place of Work and not used within 14 days of their arrival at the Place of Work. The Owner shall only become liable to pay for the remainder of said Products and/or costs of said Construction Equipment after those Products and/or Construction Equipment are actually used at the Place of Work and is/are invoiced in accordance with the terms of the Contract Documents.

Add the following paragraphs 3.7.8.1., 3.7.8.2, 3.7.8.3, and 3.7.8.4:

3.7.8 The Contactor shall:

- .1 furnish competent and adequate labour and staff, who shall be in attendance at the Place of Work at all times, as necessary, for the proper administration, co-ordination, supervision, and superintendence of the Work;
- .2 organize the procurement of all Products and Construction Equipment so that labour and staff will be available at the requisite times to complete the Work in accordance with GC 3.4 Construction Schedule;
- .3 keep an adequate force of skilled workers at the Place of Work, as necessary, to complete the Work in accordance with all requirements of the Contract Documents and in accordance with GC 3.4 Construction Schedule; and
- .4 provide the Owner, Project Manager, and Consultant, with the names, work addresses, and telephone numbers of the appointed representative of the Contract and other responsible field persons who may be contacted during non-working hours.

9 GC 3.8 SHOP DRAWINGS AND OTHER SUBMITTALS

Add the words “AND OTHER SUBMITTALS” to the Title after SHOP DRAWINGS in GC 3.8.

Add “and Submittals” after each instance of the words “Shop Drawings” in paragraphs 3.8.1, 3.8.2, 3.8.3, 3.8.3.2, 3.8.5, 3.8.6, and 3.8.7.

Add the following paragraph 3.8.1.1:

3.8.1.1 Prior to the first application for payment, the Contractor and the Consultant shall jointly prepare a schedule of the dates for submission and return of Shop Drawings and any Submittals.

Add the following subparagraph 3.8.4.1:

3.8.4.1 The following paragraph shall apply to each Shop Drawing and Submittal reviewed in connection with the project. The Consultant’s review conducted pursuant to GC 3.8.3 shall not imply that the Consultant has approved the detailed design inherent in the Shop Drawings or Submittals, responsibility for which shall remain with the Contractor submitting same. The Contractor is responsible for information that pertains solely to fabrication processes or to techniques of construction and installation, and for coordination of the work of all sub trades.

Delete the following words in paragraph 3.8.7:

3.8.7 “with reasonable promptness so as to cause no delay in the performance of the Work” and replace those words with: “within ten (10) working days or such longer period as may be reasonably required”.

Add new GC 3.9 as follows:

10 GC 3.9 CONTRACTOR RESPONSIBILITY FOR WATER TIGHTNESS

GC 3.9 The Drawings and Specifications are not intended to depict each and every condition or detail of construction. As the knowledgeable party in the field, the contractor is in the best position to verify that all construction is completed in a manner which will provide a watertight structure.

The contractor has the sole responsibility for ensuring the watertight integrity of the structure.

Add new GC 3.10 as follows:

11 GC 3.10 PERFORMANCE BY CONTRACTOR

GC 3.10 In performing the Work and all its services and obligations under the Contract, the Contractor shall exercise a standard of care, skill and diligence that would normally be provided by an experienced and prudent contractor supplying similar services for similar projects. The Contractor acknowledges and agrees that throughout the Contract, the Contractor's obligations, duties and responsibilities shall be interpreted in accordance with this standard. The Contractor shall exercise the same standard of due care and diligence in respect of any products, personnel, or procedures which it may recommend to the Owner.

The Contractor further represents, covenants and warrants to the Owner that:

1. The personnel it assigns to the Project are appropriately experienced;
2. It has sufficient staff of qualified and competent personnel to replace its designated supervisor and project manager, subject to the Owner's approval, in the event of death, incapacity, removal or resignation.

12 GC 4.1 CASH ALLOWANCES

Delete paragraph 4.1.7 in its entirety and substitute:

4.1.7 At the commencement of the Work, the Contractor shall prepare for the review and acceptance of the Owner and the Consultant a schedule indicating the times, within the construction schedule referred to in GC 3.4, at which items called for under cash allowances and items that are specified to be purchased by the Owner and installed or hooked up by the Contractor are required to be at the Place of the Work to avoid delaying the progress of the Work.

Add new paragraph 4.1.8:

4.1.8 The *Owner* reserves the right to call, or to have the Contractor call, for competitive bids for portions of the Work, to be paid for from cash allowances.

13 GC 5.1 FINANCING INFORMATION REQUIRED OF THE OWNER

Delete section GC 5.1 in its entirety.

14 GC 5.2 APPLICATION FOR PROGRESS PAYMENT

Add to paragraph 5.2.1, “, the Project Manager,” after the word “Owner”.

Add the following at the end of paragraph 5.2.2:

5.2.2 Such applications shall be accompanied by one or more of the following documents: a Statutory Declaration, Waiver of Lien, or receipt, stating that the holdback monies claimed have been paid to the particular party or parties so named or referred to therein. The form of the Statutory Declaration, Waiver of Lien, or receipt shall meet the approval of the Consultant.

Add the following paragraph 5.2.9:

5.2.9 The reference to payment for Products delivered to the Place of the Work in Article 5.2.8 shall not be construed as covering day-to-day financing of the Project. Products delivered to the Place of the Work shall be construed to mean major items of equipment or quantities of items that are essential for the expedient conduct of the Work.

Add the following paragraph 5.2.10:

5.2.10 The Contractor shall submit all applications for payment and invoices (with supporting documents as required by the Contract Documents) to the Owner via the following email address:
operations-invoices@hrce.ca

15 GC 5.3 PAYMENT

Supplement paragraph 5.3.1 by adding the following:

5.3.1 A holdback percentage of ten (10) percent (%) shall apply to progress payments. The sworn statement by the Contractor for release of holdback monies shall be in the form of a Statutory Declaration meeting the approval of the Consultant. Amounts as certified by the Consultant to rectify deficiency items, or incomplete portions of individual work items, may be retained by the Owner after Substantial Performance has been obtained, pending Total Performance of the work or other authorization for release by the Consultant.

Amend subparagraph 5.3.1.2 as follows:

5.3.1.2 Delete "28" and replace with "30."

16 GC 5.4 SUBSTANTIAL PERFORMANCE OF THE WORK AND PAYMENT OF HOLDBACK

Add the following paragraph 5.4.7:

5.4.7. Before the Contractor submits his application for Substantial Performance of the Work, all Operations and Maintenance Manual materials shall be submitted in accordance with the Contract Documents. The Certificate of Substantial Performance will not be issued until this requirement is met.

Add the following subparagraph 5.4.8:

5.4.8 After the issuance of a certificate of Substantial Performance of the Work by the Consultant, the Contractor shall promptly submit to the Consultant and the Owner (i) a Certificate from a barrister stating that there are no Builders' Liens filed relating to the Work and (ii) a Clearance Letter from the Workers' Compensation Board.

17 GC 5.5 FINAL PAYMENT

Add the following subparagraphs 5.5.1.1, 5.5.1.2, 5.5.1.3, and 5.5.1.4:

5.5.1.1 The Contractor's application for final payment is considered to be valid only when all of the following have been performed:

1. Work has been completed and inspected for compliance with Contract Documents, and the Consultant is satisfied that all the requirements of the Contract have been fulfilled by the Contractor.
2. Defects have been corrected, deficiencies have been completed, and the Place of Work is (i) free of waste products and debris, and (ii) clean and suitable for use or occupancy by the Owner.
3. Equipment and systems have been tested, adjusted and balanced and are fully operational, and written reports as outlined in the Contract Documents have been provided to the Consultant.
4. Certificates required by Utility companies, manufacturer's representative and inspectors have been submitted.
5. Spare parts, maintenance materials, warranties and bonds have been provided.

5.5.1.2 If Work is deemed incomplete by the Consultant, the Contractor shall complete outstanding items and request re-inspection.

5.5.1.3 If, within sixty (60) days after the issuance by the Consultant of the Certificate of Substantial Performance, the Contractor has not corrected all the deficiencies, the Owner will retain sufficient money to cover the cost of completing said deficiencies, as determined by the Consultant, in

addition to holding monies retained in accordance with the Contract Documents and subject to the provisions of the Builders' Lien legislation of Nova Scotia.

5.5.1.4 Neither the final certificate nor the payment thereunder, nor any provision in the Contract Documents shall relieve the Contractor from responsibility for faulty material or workmanship which shall appear within a period of one (1) year from the date when Ready-For-Takeover has been attained and the Contractor shall promptly remedy any defects due thereto and pay for any damage to other Work resulting therefrom which shall appear within such period of one year. The Owner shall give notice of observed defects reasonably promptly. This article shall not be deemed to restrict any liability of the Contractor arising out of any law in force in the Province of Nova Scotia.

18 GC 6.2 CHANGE ORDER

Add the following paragraphs 6.2.3, 6.2.4, 6.2.5, 6.2.5, 6.2.6, 6.2.7, and 6.2.8:

- 6.2.3 All contemplated changes in the work shall be issued by the Consultant on a "Contemplated Change Order" form.
- 6.2.4 For lump sum pricing, the Contractor shall, upon receipt of the Contemplated Change Order, submit to the Consultant for approval within seven (7) days, a quotation for changes in the work. The Contractor acknowledges that failure to do so will result in foreseeable delay to the approval and payment of changes in the Work and foreseeable Additional costs to the Owner.
- 6.2.5 Quotation for changes shall be priced in sufficient detail (GC 6.6 applies).
- 6.2.6 Consultant shall, within five (5) working days, notify the Contractor whether estimates are accepted by Owner or further information is required. Acceptance of the Owner shall be indicated in writing, and a signed copy of the Contemplated Change Order form shall be returned to the Contractor.
- 6.2.7 The Contractor shall take reasonable measures to stop Work or minimize the Work in areas affected by or related to the contemplated change(s).
- 6.2.8 For each change in the Work, the Contract Price shall be increased by the net cost of that change in the Work, plus the following mark-ups for all overhead and profits:
 - a. a 10% mark-up on the direct cost of the net change in the Work for change work performed by the Contractor's own forces; and
 - b. a 5% mark-up on the change work performed by Subcontractors.

Credits for reduced or Deleted portions of the Work shall be the actual cost of that Work, without Addition or subtraction of any amount by the Contractor for overhead and profit, and shall be included in the actual cost of the net change.

19 GC 6.3 CHANGE DIRECTIVE

Delete paragraph 6.3.6.3 of GC 6.3 and replace with:

6.3.6.3. The Contractor's percentage fee referred to in paragraphs 6.3.6.1 and 6.3.6.2 shall be calculated and determined applying the following percentage mark-ups for overhead and profit:

- a. a 10% mark-up on the direct cost of the net change in the Work for change work performed by the Contractor's own forces; and
- b. a 5% mark-up on the change work performed by Subcontractors.

Add to GC 6.3 the following paragraphs 6.3.14 and 6.3.15:

6.3.14 If unit prices are set out in the Contract or subsequently agreed upon, then the unit process alone shall govern in relation to determining the cost of any item for a Change Directive.

6.3.15 Payment of the cost of performing work attributable to a Change Directive shall be made only if and to the extent that the Contractor has taken all reasonable steps to mitigate and minimize the impact of the change and the resulting cost.

20 GC 6.4 CONCEALED OR UNKNOWN CONDITIONS

Add new paragraph 6.4.5:

6.4.5 The *Contractor* confirms that, prior to bidding the *Project*, it carefully investigated the Place of the Work and applied to that investigation the degree of care and skill described in paragraph 3.10, given the amount of time provided between the issue of the bid documents and the actual closing of bids, the degree of access provided to the Contractor prior to submission of bid, and the sufficiency and completeness of the information provided by the Owner. The Contractor is not entitled to compensation or to an extension of the Contract Time for anything which could reasonably have been ascertained by the Contractor by such careful investigation undertaken prior to the submission of the bid.

21 GC 6.5 DELAYS

Delete the period at the end of paragraph 6.5.1 and substitute the following words:

6.5.1 “, but excluding any consequential, indirect or special damages.”

Add new paragraph 6.5.6:

6.5.6 If the Contractor is delayed in the performance of the Work by any act or omission of the Contractor or anyone employed or engaged by the Contractor directly or indirectly, or by any cause within the Contractor's control, then the Contract Time shall be extended for such reasonable time as the Consultant may decide in consultation with the Contractor. The Owner shall be reimbursed by the

Contractor for all reasonable costs incurred by the Owner as the result of such delay, including all services required by the Owner from the Consultant as a result of such delay by the Contractor and, in particular, the cost of the Consultant's services during the period between the Ready-for-Takeover date stated in Article A-1 herein (subject to any adjustment in accordance with the Contract Documents) and any later, actual date Ready-for-Takeover is attained by the Contractor.

Add new paragraph 6.5.7:

6.5.7 The Consultant shall not, except by written notice to the Contractor, stop or delay any part of the Work pending decisions or proposed changes.

22 GC6.6 CLAIMS FOR A CHANGE IN CONTRACT PRICE

Add the following to the end of paragraph 6.6.1, deleting the "." after the word "Consultant":

"in no case more than 10 Working Days from the event or series of events giving rise to the claim".

Amend paragraph 6.6.5 as follows:

6.6.5 Add the words "as noted in paragraph 6.6.3" after the words "of the claim" and add the words "and the consultant", at the end.

Add the following paragraph 6.6.7:

6.6.7 If the Contractor claims for an increase in the Contract Price pursuant to this GC 6.6, the amount of any such claim shall be limited to the amount determined in accordance with the methods of quantification set out in paragraphs 6.3.6, 6.3.7, and 6.3.14 of GC 6.3, and the Contractor shall promptly submit a detailed breakdown of all labour, materials, overhead, and profits claimed, including those of Subcontractors. Contemporaneous records are required to support a claim for an increase in the Contract Price, and the Owner retains the right to verify all submitted records through an independent audit. The Owner is not liable for costs not so substantiated. Any mark-up for overhead and profit on the claimed amount under this GC 6.6 shall be limited to the amounts provided for under GC 6.3.6.3, as Amended by these Supplementary Conditions.

23 GC 8.3 NEGOTIATION, MEDIATION, AND ARBITRATION

Add the following paragraphs 8.3.9, 8.3.10, 8.3.11, 8.3.12, 8.3.13, 8.3.14, and 8.3.15:

8.3.9 Within five (5) days of receiving a Notice in Writing requesting arbitration, the party receiving the notice shall give the Consultant a written notice containing:

- a. a copy of the Notice in Writing requesting arbitration;
- b. a copy of supplementary conditions 8.2.9 to 8.2.14 of this contract, and;

- c. a concise description of any claims or issues which the Contractor or the Owner, as the case may be, wishes to raise in relation to the Consultant arising out of the issues in dispute in the arbitration.

8.3.10 The Owner and the Contractor agree that the Consultant may elect, within ten (10) days of receipt of the notice under paragraph 8.3.9, to become a full party to the arbitration under paragraph 8.3.6 if the Consultant:

- a. has a vested or contingent financial interest in the outcome of the arbitration;
- b. gives the notice of its election to the Owner and the Contractor before the arbitrator is appointed;
- c. agrees to be a party to the arbitration within the meaning of the rules referred to in paragraph 8.3.6, and;
- d. agrees to be bound by the arbitral award made in the arbitration.

8.3.11 If an election is made under paragraph 8.3.10, the Consultant may participate in the appointment of the arbitrator and, notwithstanding the rules referred to in paragraph 8.3.6, the time period for reaching agreement on the appointment of the arbitrator shall begin to run from the date the respondent receives a copy of the notice of arbitration.

8.3.12 The arbitrator in the arbitration in which the Consultant has elected under paragraph 8.3.10 to become a full party may:

- a. on application of the Owner or the Contractor, determine whether the Consultant has satisfied the requirements of paragraph 8.3.10, and;
- b. make any procedural order considered necessary to facilitate the Addition of the Consultant as a party to the arbitration.

8.3.13 The provisions of paragraph 8.3.9 shall apply mutatis mutandis to written notice to be given by the Consultant to any sub-consultant.

8.3.14 In the event of notice of arbitration given by the Consultant to a sub-consultant, the sub-consultant is not entitled to any election with respect to the proceeding as outlined in 8.3.10, and is deemed to be bound by the arbitration proceeding.

8.3.15 An application for arbitration shall be accompanied by security in the amount of \$1,000 to apply to the cost of arbitration. Any claims of excess costs must be submitted in writing to the Consultant within two weeks of completion or alleged completion of the work. No claims shall be accepted after this date and, also, no claims shall be accepted for disputed work unless the Consultant has been notified as specified.

24 GC 9.1 PROTECTION OF WORK AND PROPERTY

Delete subparagraph 9.1.1.1 in its entirety and substitute the following new paragraph 9.1.1.1:

9.1.1.1 errors or omissions in the Contract Documents which the Contractor could not have discovered applying the standard of care described in paragraph 3.10.

Delete paragraph 9.1.2 in its entirety and substitute the following new paragraph 9.1.2:

9.1.2 Before commencing any Work, the Contractor shall determine the locations of all underground utilities and structures indicated in the Contract Documents, or that are discoverable by applying to an Inspection of the Place of the Work exercising the degree of care and skill described in paragraph 3.10.

25 GC 9.2 TOXIC AND HAZARDOUS SUBSTANCES

Add in paragraph 9.2.6 after the word “responsible”, the following new words:

9.2.6 Or whether any toxic or hazardous substances or materials already at the Place of the Work (and which were then harmless or stored, contained or otherwise dealt with in accordance with legal and regulatory requirements) were dealt with by the Contractor or anyone for whom the Contractor is responsible in a manner which does not comply with legal and regulatory requirements, or which threatens human health and safety or the environment, or material damage to the property of the Owner and others,

Add in subparagraph 9.2.7.4:

9.2.7.4 “and the Consultant” after “Contractor”:

Add in paragraph 9.2.8 after the word “responsible”, the following new words:

9.2.8 or that any toxic or hazardous substances or materials already at the Place of the Work (and which were then harmless or stored, contained or otherwise dealt with in accordance with legal and regulatory requirements) were dealt with by the Contractor or anyone for whom the Contractor is responsible in a manner which does not comply with legal and regulatory requirement, or which threatens, human health and safety or the environment, or material damage to the property of the Owner or others,

26 GC 9.4 Construction Safety

Add to the end of paragraph 9.4.1:

The Contractor shall be responsible for and ensure the safety of not only the workers, Subcontractors, tradespeople, and Suppliers, and their equipment, but also of all other persons who enter the Place of Work whether during working hours or not, and for that purpose shall erect

such hoardings and signs and shall employ such safety measures as may be necessary to ensure the safety of such persons.

Delete paragraph 9.4.5 and replace with:

The Contractor shall be responsible for the cost to comply with any public health order(s) affecting the performance of the Work issued pursuant to the Health Protection act (Nova Scotia) or pursuant to any similar legislation, whether Federal or Provincial.

27 GC 9.5 MOULD

Add in subparagraph 9.5.3.4:

9.5.3.4 “and the Consultant” after “Contractor”

28 GC 10.1 TAXES AND DUTIES

Add the following paragraph 10.1.3:

10.1.3 The Contractor shall indicate on each application for payment as a separate amount, the appropriate Harmonized Sales Tax the Owner is legally obliged to pay. This amount will be paid to the Contractor in Addition to the amount certified for payment under the Contract. The Contractor’s HST registration number must appear on all invoices.

29 GC 10.2 LAWS, NOTICES, PERMITS AND FEES

Delete from the first line of paragraph 10.2.5 the word, “The” and substitute the words:

10.2.5 “Subject to paragraph 3.10, the”

30 GC 10.4 WORKERS' COMPENSATION

Add the following paragraphs 10.4.2, 10.4.3, 10.4.4, and 10.4.5:

10.4.2 The contractor is referred to regulations, as applicable, under the Worker's Compensation Act of Nova Scotia.

10.4.3 The Contractor’s registration with the Worker’s Compensation Board shall be continuous during the contract. Should registrations be scheduled to expire during the contract period, the Contractor shall submit a copy of its registration renewal one month prior to the expiration of the current certificate.

10.4.4 The Contractor shall furnish evidence of coverage under the Worker’s Compensation Act of Nova Scotia and a clearance Certificate providing proof of registration with the Worker’s Compensation Board prior to commencement of the Work. (A photocopy of the Contractors registration

certificate is acceptable proof). On-going proof of good standing with the Worker's Compensation Board during the term of the contract is required.

- 10.4.5 The Contractor shall also maintain a Certificate of Recognition (COR) from a safety audit company recognized by the Workers' Compensation Board, such as the Nova Scotia Construction Safety Association, for the duration of the Contract. The Contractor shall provide a copy of its COR to the Owner and Consultant prior to commencement of the Work and shall provide a copy of its COR to the Owner or Consultant upon request.

GC 11.1 INSURANCE

Delete sentences and replace with the following in subparagraph 11.1.1.1:

- 11.1.1.1 **Delete:** "General liability insurance shall be maintained from the commencement of the Work until one year from the date of Ready-for-Takeover. Liability coverage shall be provided for completed operations hazards from the date of Ready-for-Takeover on an ongoing basis for a period of 6 years following Ready-for-Takeover" **and replace with:** "General Liability Insurance or Wrap- Up Liability Insurance, (as detailed in the Information to Tenders section under "Insurance Requirements"), shall be maintained from the commencement of the Work until final completion and acceptance of the Work including the making good of faulty work or materials, except that coverage of completed operations liability shall in any event be maintained for twelve (12) months from date of Ready-for-Takeover".

Add the following subparagraphs 11.1.1.1.1, 11.1.1.1.2, and 11.1.1.2.1:

- 11.1.1.1.1 The general liability insurance to be maintained by the Contractor shall include Commercial General Liability Insurance covering Premises and Operations Liability, elevators, broad form property damage, broad form automobile, owners and contractors protective, blanket contractual, personal injury, completed operations liability contingent employers liability, cross liability clause, non-owned automobile liability, and a 30 day notice of cancellation clause.
- 11.1.1.1.2 All liability insurance policies shall be written in such terms as will fully protect the Contractor and The Halifax Regional Centre for Education as an Additional named insured.
- 11.1.1.2.1 Liability coverage of not less than ten million dollars (\$10,000,000) is required with regard to operations of owned and non-owned automobiles.

Delete subparagraph 11.1.1.4 in its entirety and insert the following subparagraphs:

- 11.1.1.4 Broad Form (All Risks) Builders Risk Coverage - Prior to the commencement of any Work the Contractor shall maintain and pay for Broad Form (All Risks) Builders Risk Coverage in the joint names of The HRCE and the Contractor totaling not less than one hundred percent (100%) of the total value of the Work to be done and materials delivered on the site

(contract value), so that any loss under such policies of insurance will be payable to The HRCE and the Contractor as their respective interests appear. The Builders Risk Insurance shall include all materials related to the Work while in transit or at other locations.

- 11.1.1.4.1 Should a loss be sustained under the Builders Risk Coverage, the Contractor shall act on behalf of The HRCE and Contractor for the purpose of adjusting the amount of such loss with the insurance companies. As soon as such adjustment has been satisfactorily completed, the Contractor shall proceed to repair the damage and complete the Work and shall be entitled to receive from The HRCE in Addition to any sum due under the Contract, the amount at which The HRCE interest has been appraised in the adjustment made with the insurance companies as referred to above, said amount to be paid to the Contractor as the Work of restoration proceeds. Any loss or damage which may occur shall not affect the rights and obligations of either party under the Contract except as aforesaid and except that the Contractor shall be entitled to a reasonable extension of time for the performance of the Work, as The HRCE may decide.
- 11.1.1.4.2 Upon Ready-for-Takeover being attained, the Contractor's obligation to maintain Builder Risk Insurance shall cease and The HRCE shall assume full responsibility for insuring the whole of the Work against loss or damage.
- 11.1.1.4.3 "Broad form" property insurance in the joint names of the *Contractor*, the *Owner* and the *Consultant*. The policy shall include as insureds all *Subcontractors*. The Broad form" property insurance shall be provided from the date of commencement of the Work until the earliest of:
- 11.1.4.3.1 Ten (10) Calendar days after Ready-for-Takeover;
- 11.1.4.3.2 on the commencement of use or occupancy of any part or section of the *Work* unless such use or occupancy is for construction purposes, habitational, office, banking, convenience store under 465 square meter in area, or parking purposes, or for the installation, testing and commissioning or equipment forming part of the *Work*; and
- 11.1.4.3.3 when left unattended for more than thirty (30) consecutive calendar days or when construction activity has ceased for more than thirty (30) consecutive calendar days.

Paragraph 11.1.2 is supplemented as follows:

- 11.1.2 In addition, within seven (7) working days after notification of award or in any event prior to payment of the first progress claim, the Contractor shall submit certified true copies of each insurance policy to the Owner's Contract Authority. Such copies shall be exclusive of information pertaining to premium or premium bases used by the insurer to determine the cost of the insurance. Prior to the commencement of any work, the Contractor shall file with the Owner a certified copy of each insurance policy and certificate required.

Delete 11.1.5 in its entirety and replace with the following:

11.1.5 Insurance contracts shall be procured from and the premiums paid to a resident agent of an insurance Company licensed to underwrite insurance in the Province of Nova Scotia.

Add the following paragraph 11.1.9:

11.1.9 All of the insurance policies shall contain a clause stating that no change in terms and conditions or cancellation may at any time be made without the full knowledge and consent of the Owner.

31 GC 11.2 CONTRACT SECURITY

Add the following paragraphs 11.2.1, 11.2.2, and subparagraph 11.2.2.1:

11.2.1 The Contractor shall, prior to commencement of the *Work* or within the specified time, provide to the *Owner* and the Consultant the *Contract* security specified in the *Contract Documents*.

11.2.2 If the *Contract Documents* require surety bonds to be provided, such bonds shall be issued by a duly licensed surety company authorized to transact the business of suretyship in the province or territory of the *Place of the Work* and shall be maintained in good standing until the fulfillment of the *Contract*. The form of such bonds shall be in accordance with the latest edition of the CCDC approved bond forms, or in such other form as specified by the Owner.

11.2.2.1 "Bonds shall be procured from a Nova Scotia resident agent of an insurance company licensed to do business in Nova Scotia and shall be maintained in good standing and held by the Owner until one (1) year after Ready-for-Takeover.

Add the following paragraph 11.2.3:

11.2.3 If a Certified Cheque is held as contract security it shall be in an amount equal to ten (10) percent (%) of the Contract Price. The Contract shall supplement the Certified Cheque as necessary to maintain the amount equal to ten (10) percent (%) of the total amount payable (Contract Price plus HST).

- .1 The Certified Cheque will be deposited at the chartered bank holding The HRCE deposits.
- .2 The HRCE will return the cheque amount to the Contractor upon satisfactory completion of the contract and duration as specified in the Tender documents.
- .3 Should Contractor default, total amount payable under the Certified Cheque will be the face value of the cheque plus all accrued interest.
- .4 Payment for completion of work, due to failure of performance of the Contractor, shall include all reasonable obligations under the Contract, including architectural and engineering costs arising because of the default of the Contractor.

- .5 Payment for labour and materials shall be limited to those who have a direct contract with the Contractor for the provision of labour and/or material (which includes equipment rental).

32 GC 12.3 WARRANTY

In paragraph 12.3.2, delete from the first line the word, "The" and substitute the words:

12.3.2 "Subject to paragraph 3.10, the..."

Add the following paragraph 12.3.7:

12.3.7 Warranty repairs or replacements which arise during warranty period which affect the operation of the system shall be attended to immediately upon notification from the Consultant.

33 GC 13.3 INDEMNIFICATION

Add the following paragraph 13.1.1.3:

13.1.1.3 The Contractor shall indemnify and hold harmless the Consultant, its agents and employees from and against claims, demands, losses, costs, damages, actions, suits, or proceeding by third parties that arise out of, or are attributable to, the Contractor's performance of the Contract, provided such claims are attributable to bodily injury, sickness, disease, or death, or to injury to or destruction of tangible property, and caused by negligent acts or omissions of the Contractor or anyone for whose acts the Contractor may be liable, and made in writing within a period of six (6) years from t Ready-for-Takeover, or within such shorter such period as may be prescribed by any limitation statute or the province or territory of the Place of the Work.

END OF SECTION 00 73 00

SECTION 01 11 00 - HRCE SUMMARY OF WORK

1. Project Location & General Scope

- 1.1.** Harrietsfield Elementary, 1150 Old Sambro Road, Harrietsfield, Nova Scotia.
- 1.2.** Scope: Refer to Section 00 00 15 for scope and schedule information.

2. Contract Documents

- 2.1.** Work will be performed under CCDC-2 contract.

3. General Conditions

- 3.1.** Halifax Regional Centre for Education and CCDC-2 form an integral part of this Project Manual, a copy of which is bound herein.

4. Project Manual

- 4.1.** Sections of the Project Manual are numbered in conformance with the Master List of Section Titles and Numbers, CSC Document 004E, published jointly by Construction Specifications Canada and The Construction Specifications Institute (USA). Sections are arranged in their standard format.
- 4.2.** Sections are written as units of the Work which have been assigned numbers in conformance with the CSC/CSI system. They are arranged in sequence for this Manual. Gaps in the order of numerical sequence do not indicate that a section has been inadvertently omitted from this Manual, but, rather that a Section is not required for completion of the Work.
- 4.3.** Wherever the project location building name occurs in the Contract Documents it shall be taken to mean all work included in the Contract.
- 4.4.** Wherever in the Contract Documents the words "approval", "approved", "direction", "directed", "selection", "selected", "request", "requested", "report", and similar words are used, such approvals, directions, selections, requests and reports shall be given by the HRCE unless specifically stated otherwise.
- 4.5.** Wherever in the Contract Documents the word "provide" is used in any form, it shall mean that the Work concerned shall include both supply and installation of the products required for completion of that part of the Work.
- 4.6.** Wherever in this Project Manual it is specified that Work is to proceed or to meet approval, direction, selection or request of jurisdictional authorities or others, such approval, direction, selection or request shall be in writing.

5. Errors & Omissions

- 5.1.** If errors or omissions are observed in the Contract Documents, immediately notify the HRCE Procurement Contact in writing of all such errors or omissions. In the event no such notice is given, the Contractor will be held responsible for the results of any such error or omission and the cost of rectifying the same.

6. Division 1

- 6.1.** The provisions of all Sections of **Division 1** shall apply to each Section of this Specification.

7. Wage Rates

- 7.1.** Pay all employees engaged on the Work a wage not less than the minimum wage per hour as set out by the Province of Nova Scotia. For overtime work beyond 48 hours in any one week, pay no employee at a rate of less than one and one-half times the minimum wage per hour noted above. Provide for these wage rates in tendered contract amount.

8. Work Performed Under Separate Contracts

- 8.1.** Work not to be included in the Contract, as noted "NIC" on the Drawings, shall be governed by Article 37, Separate Contracts, of General Conditions of Contract.
- 8.2.** Furniture installation will be carried out by others.
- 8.3.** Computer installation will be carried out by others.

9. Project Schedule

- 9.1. Refer to Section 00 00 15 Description of Work.**
- 9.2.** Existing services (mechanical & electrical) will need to be maintained through the renovations.
- 9.3.** During construction, all life safety systems as well as mechanical and electrical systems must be in active, usable condition to permit the school to operate or alternate methods used to ensure the safe operation of the school as directed by HRCE project representative.
- 9.4.** As construction progresses revise the schedule to compensate for any delays or unforeseen activities so as to maintain the contract completion date. Each schedule submission is to be complete with a statement indicating the changes made, the reason they were changed and confirmation that the project completion date will not change. The above schedule information is to be submitted monthly or more often if necessary.

10. Site Progress Records

- 10.1.** Maintain at site a permanent written record of progress of Work. Make the record available at all times with copies provided when requested. Include in record each day:
 - 10.1.1.** Commencement and completion dates of the Work of each trade in each area of Project.
 - 10.1.2.** Attendance of Contractor's and Subcontractor's Work forces at Project and a record of the work they perform.
 - 10.1.3.** Visits to site by representatives of the Owner, Engineer, jurisdictional authorities, Contractor, Subcontractors, and suppliers.
- 10.2.** Maintain a progress chart in approved format. Show on chart proposed Work schedule and progress of Work by Contractor and Subcontractor.

11. Examination

- 11.1.** Site:
 - 11.1.1.** Examine site, and ensure that site conditions have been examined, that all are fully informed on all particulars which affect Work thereon and at the place of construction, and in order that construction proceeds competently and expeditiously.
 - 11.1.2.** Ensure by examination that all physical features, and working restrictions and limitations which exist are known.
- 11.2.** Previously Completed Work:
 - 11.2.1.** Verify dimensions of existing Work in place before construction of Work to be incorporated with it.
 - 11.2.2.** Verify that previously executed Work and surfaces are satisfactory for construction, and that performance of subsequent Work will not be adversely affected.
 - 11.2.3.** Commencement of Work will constitute acceptance of site conditions and previously executed Work as satisfactory.
 - 11.2.4.** Report to Engineer defects in prior Work which will affect quality of subsequent Work, or construction schedule.
- 11.3.** Construction Measurements:
 - 11.3.1.** Before commencing installation of Work, verify that its layout is accurate in accordance with intent of Drawings, and that locations, elevations, and clearances to adjacent infrastructure are maintained.
 - 11.3.2.** If Work is installed in wrong location, rectify it before other Work concerned proceeds.

12. PROTECTION OF WORK, PROPERTY & PERSONS

- 12.1.** Include in Work necessary methods, materials, and construction to ensure that no damage or harm to Work, materials, property and persons results from the Work of this Contract. Temporary facilities relating to protection are specified in Section 01 52 00.
- 12.2.** Protect, and if damaged make good, adjacent private and public property.
- 12.3.** Keep surfaces, on which finish materials will be applied, free from grease, oil, and other contamination which would be detrimental in any way to the application of finish materials.
- 12.4.** Protect finished surfaces of completed Work from damage by restriction of access or by use of physical means suitable to the material and surface location. Establish with each Subcontractor the suitability of such protection in each case.
- 12.5.** Protect existing underground infrastructure, mechanical, electrical, telephone and similar services from damage. If necessary, relocate active services to ensure that they function continuously in safety and without risk of damage.
- 12.6.** Cap off and remove unused utility services encountered during Work after approval is given by the utilities concerned or jurisdictional authorities, whichever may apply. Relocation, removal, protection and capping of existing utility services shall be performed only by the applicable utility and of other services by licensed mechanics.
- 12.7.** To prevent soiling or damage to finish flooring where pedestrian traffic occurs after the flooring has been installed, install and maintain 6 mil. polyethylene membrane or reinforced kraft paper temporary protection, secured in place and with joints sealed by reinforced pressure sensitive tape.
- 12.8.** Install plywood panels of minimum ¼" thickness over completed finish flooring materials, on which further construction Work is performed by other trades or delivery of products is made, or both. Seal joints between panels with reinforced pressure sensitive tape.
- 12.9.** Prevent spread of dust beyond the construction zone by wetting, or by other approved means, as it accumulates.
- 12.10.** The outside work area shall be appropriately demarked and/or surrounded by rigid chain link panels or fencing (at the cost of the contractor) to prevent unauthorized entry to the work area. Any area of roof having work completed is to be covered below with this fencing approximately 10' from the edge of the building. It is to be maintained at all times throughout the project. All waste disposal bins are to be fenced in using the same type of fencing as indicated above during working hours. After working hours, all waste disposal bins shall be located a minimum of 25 feet from any structure. Any windows where the debris chute is located are to be covered. All entrances below the roof area are to have covered scaffolding erected to ensure a safe travel path to a distance of ten feet from edge of building. All workers shall contain their activity to the work site area. Access to the school shall only be allowed as

planned in coordination with HRCE Operations and the school administration.

- 12.11.** All security on site shall be coordinated through HRCE using an HRCE preferred vendor.
- 12.12.** The contractor is responsible for the cost of security for all project materials.
- 12.13.** If access to the project site is required inside the building, HRCE will provide security personnel at its own cost.
- 12.14.** The contractor shall keep the work site free from accumulated debris caused by the employees or work and shall remove all debris at the end of each work shift. Debris shall not be deposited in HRCE controlled garbage and/or recycling containers.
- 12.15.** All waste materials and debris created during demolition and/or construction shall be disposed of in a dumpster provided by the contractor, to be removed at the end of the construction project, using a methodology that is in compliance with the applicable HRM solid waste by laws. Otherwise, the material must be removed and disposed of off-site at the end of each working day. The waste materials may not be stored on site unless they are held in an approved project dumpster no closer than twenty five (25) feet from any structure.
- 12.16.** All temporary structures such as portable washroom facilities, materials storage trailer, work trailer, debris dumpster, vehicles, etc., shall be located a minimum of (25) twenty-five feet from the school building.
- 12.17.** Where applicable, a hot work permit will be required to be completed and approved by HRCE prior to commencement of work and all conditions of the permit must be maintained until completion of hot work. A copy of the hot work permit signed by the contractor representative shall be provided to HRCE upon completion of each hot work session. Contractor must assign a designated fire watch as noted on the permit document who shall remain on site for three hours after completion of each hot work session.
- 12.18.** A school washroom will be designated for use where appropriate. However, protection of the surfaces as indicated above must be maintained. It should also be noted that access to the building during summer months will be limited for security reasons. Contractor is responsible to provide temporary portable washroom facilities for general use of contractor staff.
- 12.19.** Access to Interior of School - All interior access is to be scheduled with the PM. This will allow for notice to the school admin., custodial and possible scheduling of a security guard for after hour access.
- 12.20.** Adhesives / Torch Work - All adhesive use and torch work must be completed after school hours. Contractor must assign a designated fire watch as indicated above in 12.17.

13. Cleaning

- 13.1.** Ensure that during and after construction the public streets and existing asphalt parking lot are cleaned as required.

14. Salvage

- 14.1.** Unless otherwise specified, salvaged material resulting from construction, and surplus materials and construction debris shall become property of Contractor, who must dispose of it away from Site.

15. Site Limitations

- 15.1.** Since the existing building will be occupied during the Work (in accordance with the Phasing Schedule) the Architect will designate the precise areas on the site which may be utilized for work and storage, and where personnel will be permitted to be present. Refer also to Drawings. Allow for hoarding to secure construction areas from occupied portions of the Building and Site.
- 15.2.** All access to the construction site is to be coordinated with the Project Manager for HRCE and communicated at the pre-construction meeting.
- 15.3.** Any Work carried out in the building is to be carried out during hours approved by the School Administration.
- 15.4.** Any disruption to services within the building must occur during hours approved by School Administration.
- 15.5.** Any Work which may have an adverse effect on the occupancy functions, must have prior approval of the School Administration and **may** require scheduling during off-hours.

16. Security Regulations

- 16.1.** Perform Work in conformance to the security regulations of the building as directed by the Project Manager for HRCE.

17. Project Identification

- 17.1.** No project sign is required on this Project.

18. Owner's Occupancy

- 18.1.** The Owner reserves the right to occupy and use portions of the Project, whether partially or entirely completed, or whether completed on schedule or not, provided such occupancy does not interfere with the Contractor's continuing Work.
- 18.2.** Partial occupancy or installation by the Owner of his equipment shall not imply acceptance of the Project in whole, or in part, nor shall it imply acknowledgement that terms of the Agreement are fulfilled.

END OF SECTION 01 11 00

SECTION 01 11 25 - PRICES

1. General

- 1.1. Prices included in the Contract shall be complete for the applicable Work, and shall include for each price:
 - 1.1.1. Expenditures for wages and for salaries of workmen, engineers, superintendents, draftsmen, foremen, timekeepers, accountants, expeditors, clerks, watchmen and such other personnel as may be approved, employed directly under the Contractor and while engaged on the applicable Work at the site and expenditures for travelling and HRCE allowances of such employees when required by location of the applicable Work or when covered by trade agreements and when approved; provided, however, that nothing shall be included for wages or salary of the Contractor if an individual, or of any member of the Contractor's firm if the Contractor is a firm or the salary of any officer of the Corporation if the Contractor is a corporation, unless otherwise agreed to in writing.
 - 1.1.2. Expenditures for material used in or required in connection with the construction of the applicable Work including material tests and required by the laws or ordinances of any authority having jurisdiction and not included under Subparagraph .9.
 - 1.1.3. Expenditures for preparation, inspection, delivery, installation and removal of materials, equipment, tools and supplies.
 - 1.1.4. Temporary facilities as required for the applicable Work.
 - 1.1.5. Travelling expenses properly incurred by the Contractor in connection with the inspection and supervision of the applicable Work or in connection with the inspection of materials prepared or in course of preparation for the applicable Work and in expediting their delivery.
 - 1.1.6. Rentals of all equipment whether rented from the Contractor or others, in accordance with approved rental agreements including any approved applicable insurance premiums thereon and expenditures for transportation to and from the site of such equipment, costs of loading and unloading, cost of installation, dismantling and removal thereof and repairs or replacements during its use on the applicable Work, exclusive of any repairs which may be necessary because of defects in the equipment when brought to the Work or appearing within thirty (30) days thereafter.
 - 1.1.7. The cost of all expendable materials, supplies, light, power, heat, water and tools (other than tools customarily provided by tradesmen) less the salvage value thereof at the completion of the applicable Work.
 - 1.1.8. Assessments under the Workmen's Compensation Act, the Unemployment Insurance Act, Canada Pension Act, statutes providing for government hospitalization, vacations

with pay or any similar statutes; or payments on account of usual vacations made by the Contractor to his employees engaged on the applicable Work at the site, to the extent to which such assessments or payments for vacations with pay relate to the Work covered by the specified price; and all sales taxes or other taxes where applicable.

- 1.1.9. The amounts of all Subcontracts related to the specified price.
- 1.1.10. Premiums on all insurance policies and bonds called for under this Contract as related to the specified price.
- 1.1.11. Royalties for the use of any patented invention on the applicable Work.
- 1.1.12. Fees for licenses and permits in connection with the applicable Work. No Building Permit is required for the project.
- 1.1.13. Duties and taxes imposed on the applicable Work.
- 1.1.14. Such other expenditures in connection with the applicable Work as may be approved.
- 1.1.15. Provided always that except with the consent of the Owner, the above items of cost shall be at rates comparable with those prevailing in the locality of the Work.

END OF SECTION 01 11 25

SECTION 01 11 41 - PROJECT COORDINATION

1. Requirements Included

- 1.1. Each Trade Contractor's responsibilities include the coordination of Work within his own Contract and with the Work of other Contracts.

2. Related Requirements

- 2.1. Project Meetings: Section 01 31 19
- 2.2. Submittals: Section 01 33 00

3. Description

- 3.1. Coordinate Work on which subsequent Work depends to facilitate mutual progress, and to prevent conflict between parts of the work.
- 3.2. Ensure that each Section makes known for the information of the Construction Manager and other Sections, the environmental and surface conditions required for the execution of its Work, and the sequence of others Work required installation of its Work.
- 3.3. Ensure that each Section, commencing Work, and that each Section is assisted in the execution of its preparatory Work by Sections depending upon its preparation.
- 3.4. Deliver materials supplied by one Section to be installed by another well before the installation begins.
- 3.5. Sections giving installation information in error, or too late to incorporate in the Work, shall be responsible for having Work done which was thereby additionally made necessary.
- 3.6. Coordinate warranty conditions of interconnected Work to ensure that full coverage is obtained.
- 3.7. Remove work installed in error which is unsatisfactory for subsequent Work.

4. Cutting And Patching

- 4.1. Include under Work of this Section all cutting and patching of asphalt required by the Work.
- 4.2. Finish new surfaces flush with existing surfaces.
- 4.3. Cut and patch as required making work fit.
- 4.4. Make cuts with clean, true, smooth edges.
- 4.5. Patching of existing or new asphalt shall be performed only by workmen with expertise in that particular trade and who normally perform that Trade.
- 4.6. Replace, and otherwise make good, damaged or defective Work. If required by the Construction Manager.
- 4.7. Do not endanger Work or property by cutting, digging, or similar activities. No Section shall cut or alter the Work of another Section unless approved by the Section which has installed it.
- 4.8. Cut and drill with true smooth edges and to minimum suitable tolerances.

- 4.9.** If required, before cutting, drilling, or sleeving structural load bearing elements, obtain approval of location and methods.
- 4.10.** Cutting, drilling and sleeving of Work shall be done only by the Section which has installed it. The Section requiring drilling and sleeving shall inform the Section performing the Work of the location and other requirements for drilling and sleeving. The Contractor shall directly supervise performance of cutting and patching.
- 4.11.** Cutting and Patching for Holes Required by Mechanical & Electrical Work:
 - 4.11.1.** Include under Work of Mechanical Divisions cutting or provision of holes up to 8" in diameter and related patching.
 - 4.11.2.** Include under Work of this Section holes and other openings required by the work of Mechanical Divisions which are larger than 8" in diameter or least dimension, and chases, bulkheads, furring and required patching. This Section shall be responsible for determination of Work required for holes in excess of 8" diameter or least dimension.
 - 4.11.3.** Include under the Work of Electrical Divisions all cutting or provision of holes and related patching for the Work of that Division.
- 4.12.** Include under Work of this Section all other cutting and patching required by the Work except as described in Clause .11 above.
- 4.13.** Patching or replacement of damaged Work shall be done by the Subcontractor under whose Work it was originally executed, and at the expense of the Subcontractor who caused the damage.
- 4.14.** Make patches invisible in final assembly.

5. Quality Assurance

- 5.1.** Requirements of Regulatory Agencies:
 - 5.1.1.** Make known and coordinate the requirements of jurisdictional authorities, as made explicit by the Contract Documents, and by representatives of such authorities
- 5.2.** Source Quality Control:
 - 5.2.1.** Ensure that Work meets specified requirements
 - 5.2.2.** Schedule, supervise and administer inspection and testing as specified in Section 01 45 00.
- 5.3.** Job Records:
 - 5.3.1.** Maintain job records and ensure that such records are maintained by subcontractors.

Submittals

- 5.4.** Prepare a Project schedule in accordance with Section 01 33 00, and ensure that all subcontractors and suppliers are aware of the details of this schedule, and progressively of their general compliance with the schedule.
- 5.5.** Become aware of the required submittals specified in each Section, and expedite submission of such submittals so as not to hinder the Project Schedule.
- 5.6.** Review submittals and make comments as specified in Section 01 33 00.

6. Job Conditions

- 6.1.** Ensure that Work proceeds under conditions meeting specified environment and job safety requirements
- 6.2.** Ensure that protection of adjacent property and the Work is adequately provided and maintained to meet specified requirements.

7. Product Delivery, Storage And Handling

- 7.1.** Site has limited spaces for storage, only delivery of materials agreed upon by the Construction Manager will be allowed. Comply with Construction Manager's allocations. Any requirement for modifications to the building in order to allow delivery and storage of the materials to complete this work is the responsibility of the contractor.
- 7.2.** Schedule delivery of products & removal of material with Construction Manager.
- 7.3.** Make available areas for storage of products and construction equipment to meet specified requirements, and to ensure a minimum of interference with progress of the Work and relocations.
- 7.4.** Trade Contractor to provide flag persons, traffic signals, barricades and Flares/lights/lanterns as required to perform the Work and to protect the public.
- 7.5.** Material and Waste - Deliveries and Removals - Must be coordinated to be completed 30 minutes after school dismissal where applicable.

END OF SECTION 01 11 41

SECTION 01 31 19 – PROJECT MEETINGS

1. Pre-Award Meeting

- 1.1.** A Pre-award meeting will be held at which time the following will be addressed:
 - 1.1.1.** Owner and HRCE's functions.
 - 1.1.2.** The Consultant and the Consultant's functions.
 - 1.1.3.** The General Contractor and the General Contractor's functions.
 - 1.1.4.** Documentation requirements from the General Contractor.
 - 1.1.5.** Obligees for Performance and Payment Bonds from Sub-contractors.
 - 1.1.6.** Progress Claims.
 - 1.1.7.** CO's & CCO's.
 - 1.1.8.** Construction Schedule.
 - 1.1.9.** Project Start-up.
 - 1.1.10.** Job Meetings.
 - 1.1.11.** Superintendent – General Contractor's Representative.
 - 1.1.12.** Design / Administration authority.
 - 1.1.13.** Owner's Representative.
 - 1.1.14.** Special Consultants.
 - 1.1.15.** Quality of Workmanship.
 - 1.1.16.** Accountability.
 - 1.1.17.** Harmonized Sales Tax.
 - 1.1.18.** Contract Close-out Documentation.

2. Preconstruction Meeting

- 2.1.** Within fifteen (15) days after award of Contract, arrange a meeting between the Consultant, Subcontractors, Project Superintendents, Inspection and Testing Company Representatives, and representatives of others whose coordination is required during construction.
- 2.2.** Discuss at the meeting the means by which full cooperation and coordination of the participants during construction can be achieved.
- 2.3.** Document the responsibilities and necessary activities of the participants during construction as discussed and distribute to each participant.
- 2.4.** Establish procedures for maintenance and completion of Project record drawings specified in Section 01 77 00.
- 2.5.** Review and establish methods of maintaining life safety and egress for the school occupants. Communicate these methods thoroughly with the School Principal.

3. Progress Meeting

- 3.1.** Invite representatives of HRCE, to attend twice monthly site meetings called by the Contractor during the progress of the Work.

- 3.2.** Inform HRCE of each meeting and of proposed agenda a minimum of five (5) days before meeting.
- 3.3.** Submit proposed schedule of site meetings to Engineer and Owner.
- 3.4.** Record, prepare and distribute minutes of each meeting to HRCE and to each other participant within 72 hours of meeting.
- 3.5.** Ensure that all representatives who attend meetings have the authority to conduct business on behalf of firms they represent.
- 3.6.** Details of Progress Meetings to be discussed at the project start-up meeting.

4. Suggested Agendum (Preconstruction Meeting)

- 4.1.** Distribution and discussion of:
 - 4.1.1.** List of major subcontractors and suppliers.
 - 4.1.2.** Projected Construction Schedules.
- 4.2.** Critical work sequencing.
- 4.3.** Major equipment deliveries and priorities.
- 4.4.** Project Coordination:
 - 4.4.1.** Designation of responsible personnel.
- 4.5.** Procedures and Processing of:
 - 4.5.1.** Field decisions
 - 4.5.2.** Proposal requests
 - 4.5.3.** Submittals
 - 4.5.4.** Change orders
 - 4.5.5.** Applications for Payment.
- 4.6.** Adequacy of distribution of Contract Documents.
- 4.7.** Procedures for maintaining Record Documents.
- 4.8.** Use of premises:
 - 4.8.1.** Office, work and storage areas.
 - 4.8.2.** Owner's requirements.
- 4.9.** Construction facilities, controls and construction aids.
- 4.10.** Safety/Tool Box Meetings.
- 4.11.** Security procedures.
- 4.12.** Housekeeping procedures.
- 4.13.** Egress/life safety procedures

5. Suggested Agendum (Progress Meetings)

- 5.1.** Review and approval of minutes of previous meeting.
- 5.2.** Safety meeting minutes.
- 5.3.** Review of work progress since previous meeting.
- 5.4.** Field observations, problems, conflicts.
- 5.5.** Problems which impede Construction Schedule.
- 5.6.** Review of off-site fabrication, delivery Schedules.

- 5.7.** Corrective measures and procedures to regain projected schedules.
 - 5.8.** Revisions to Construction Schedules.
 - 5.9.** Maintenance of quality standards.
 - 5.10.** Pending changes and substitutions and effect on Construction Schedule.
 - 5.11.** Other Business.
-
- 6.** Attend, with representatives of HRCE weekly meetings with the School Administration to review construction activities and concerns of Building Occupants.
 - 7.** Quarterly meetings with Contractor and the HRCE / User during Warranty Period including major sub-trade contractors.
 - 8.** Dates for meetings will be set at time of completion.

END OF SECTION 01 31 19

SECTION 01 33 00 – SUBMITTAL PROCEDURES

1. General Requirements

- 1.1.** Make submittals specified in this Section to Consultant unless otherwise specified, with additional submissions made, in manner that they direct, to other parties involved with construction of the Project as their interests are concerned. These parties are, but shall not be restricted to, consultants, jurisdictional authorities, and Subcontractors whose Work must be coordinated with Work related to Submittals.
- 1.2.** Ensure that submissions are made to allow sufficient time for review without the construction schedule being delayed.

2. Document Submissions Required

- 2.1.** At Commencement of Contract:
 - 2.1.1.** Performance and Payment Bonds.
 - 2.1.2.** Public Liability and Property Damage Insurance Certificates.
 - 2.1.3.** List of Subcontractors by firm name.
 - 2.1.4.** Construction Schedule and other required schedules and estimates.
 - 2.1.5.** Site Specific Safety Plan/Safety Policy.
 - 2.1.6.** Workers' Compensation Board status.
- 2.2.** During Construction:
 - 2.2.1.** Weekly progress reports.
 - 2.2.2.** Job meeting reports and minutes.
 - 2.2.3.** Updated construction schedules.
 - 2.2.4.** Shop drawings as required.
 - 2.2.5.** Inspection and test reports.
 - 2.2.6.** Daily communication of Hot Work Permits as needed.
- 2.3.** Submissions at completion of Work are specified in Section 01 77 00, Contract Closeout.

3. Administrative

- 3.1.** Submit to Consultant submittals listed for review. Submit promptly and in orderly sequence to not cause delay in Work. Failure to submit in ample time is not considered sufficient reason for extension of Contract Time no claim for extension by reason of such default will be allowed.
- 3.2.** Do not proceed with Work affected by submittal until review is complete.
- 3.3.** Present shop drawings, product data, samples and in Imperial units.
- 3.4.** 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 coordinated with requirements of Work and Contract Documents. Submittals not stamped, signed, dated and identified as to specific project will be returned without being examined and considered rejected.

- 3.5. Notify Consultant in writing at time of submission, identifying deviations from requirements of Contract Documents stating reasons for deviations.
- 3.6. Verify field measurements and affirm that affected adjacent work is coordinated.
- 3.7. Contractor's responsibility for errors and omissions in submission is not relieved by Consultant's review of submittals.
- 3.8. Contractor's responsibility for deviations in submission from requirements of Contract Documents is not relieved by Consultant's review.
- 3.9. Keep one review copy of each submission on site.

4. Construction Schedules

- 4.1. Submit proposed construction schedule at beginning of Project, as specified in Project Documents.
- 4.2. As construction progresses, submit up-dated construction schedules as specified in Project documents.

5. Shop Drawings And Product Data

- 5.1. The term "shop drawings" means drawings, diagrams, illustrations, schedules, performance charts, brochures and other data which are to be provided by Contractor to illustrate details of a portion of Work.
- 5.2. Submit drawings stamped and signed by professional consultant registered or licensed in Province of Nova Scotia of Canada.
- 5.3. 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.
- 5.4. Allow seven (7) days for Consultant's review of each submission. Do not proceed with work involving relevant products until completion of shop drawing review.
- 5.5. 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.
- 5.6. Make changes in shop drawings as Consultant may require, consistent with Contract Documents. When resubmitting, notify Consultant in writing of revisions other than those requested.

Accompany submission with transmittal letter, in duplicate, containing:

- 5.6.1.** Date
 - 5.6.2.** Project title and number
 - 5.6.3.** Contractor's name and address
 - 5.6.4.** Identification and quantity of each shop drawing, product data and sample.
 - 5.6.5.** Other pertinent data.
- 5.7.** Submission to include:
 - 5.7.1.** Date and revision dates.
 - 5.7.2.** Project title and number.
 - 5.7.3.** Name and address of:
 - 5.7.3.1.** Subcontractor.
 - 5.7.3.2.** Supplier.
 - 5.7.3.3.** Manufacturer.
 - 5.7.4.** Contractor's stamp, signed by Contractor's authorized representative certifying approval of submissions, verification of field measurements and compliance with Contract Documents.
 - 5.7.5.** Details of appropriate portions of Work as applicable:
 - 5.7.5.1.** Fabrication.
 - 5.7.5.2.** Layout, showing dimensions, including identified field dimensions, and clearances.
 - 5.7.5.3.** Setting or erection details.
 - 5.7.5.4.** Capacities.
 - 5.7.5.5.** Performance characteristics.
 - 5.7.5.6.** Standards.
 - 5.7.5.7.** Relationship to adjacent work.
- 5.8.** After Consultant's review, distribute copies.
- 5.9.** Submit for review one electronic copy in PDF file format of shop drawings for each requirement requested in specification Sections and as Consultant may reasonably request.
- 5.10.** Submit electronic copies of product data sheets for 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.
- 5.11.** Submit electronic copies of test reports for requirements requested in specification Sections and as requested by Consultant.
 - 5.11.1.** Report signed by authorized official of testing laboratory that material, product or system identical to material, product or system to be provided has been tested in accord with specified requirements.
 - 5.11.2.** Testing must have been within three (3) years of date of contract award for project.

- 5.12.** Documentation of testing and verification actions taken by manufacturer's representative to confirm compliance with manufacturer's standards or instructions.
- 5.13.** Delete information not applicable to project.
- 5.14.** Supplement standard information to provide details applicable to project.
 - 5.14.1.** If upon review by Consultant, no errors or omissions are discovered or if only minor corrections are made, copies will be returned, and fabrication and installation of work may proceed. If shop drawings are rejected, noted copy will be returned and resubmission of corrected shop drawings, through same procedure indicated above, must be performed before fabrication and installation of work may proceed.
 - 5.14.2.** Without restricting generality of foregoing, Contractor is responsible for dimensions to be confirmed and correlated at job site, for information that pertains solely to fabrication processes or to techniques of construction and installation and for coordination of work of sub-trades.

- 5.15.** Shop Drawings are specified for submission under the following:

- Section 03 20 00 Concrete Reinforcement
- Section 05 12 23 Structural Steel
- Section 05 31 00 Steel Deck
- Section 05 50 00 Metal Fabrications
- Section 06 10 11 Rough Carpentry
- Section 06 40 00 Architectural Woodwork
- Section 07 41 43 Aluminum Composite Panels
- Section 07 46 13 Preformed Metal Siding
- Section 07 52 16 Modified Bitumen Roofing System & Flashing
- Section 07 84 00 Fire Stopping and Smoke Seals
- Section 08 11 14 Steel Doors & Frames
- Section 08 11 16 Aluminum Doors & Frames
- Section 08 14 10 Wood Doors
- Section 08 50 50 Aluminum Windows
- Section 08 62 11 Vinyl Windows
- Section 08 71 10 Door Hardware
- Section 09 22 16 Non-Load Bearing Wall Framing
- Section 09 30 13 Ceramic Tile
- Section 10 11 13 Communication Boards
- Section 10 11 23 Tackboards
- Section 10 14 53 Traffic Signs
- Section 10 28 10 Toilet & Bath Accessories
- Section 10 50 00 Miscellaneous Specialties
- Section 11 40 11 Food Services Catalogued & Custom Equipment
- Section 12 21 13 Horizontal Blinds

Section 12 21 16 Roller Shades

Section 14 42 13 Wheelchair Platform Lift

All pre-manufactured Mechanical & Electrical items as noted in Mechanical & Electrical Divisions.

6. SAMPLES

- 6.1.** Submit for review samples in duplicate as requested in respective specification Sections, as requested by the Consultant. Label samples with origin and intended use.
- 6.2.** Deliver samples prepaid to Consultant's business address.
- 6.3.** Notify Consultant in writing, at time of submission of deviations in samples from requirements of Contract Documents.
- 6.4.** Adjustments made on samples by Consultant are not intended to change.
- 6.5.** Make changes in samples which Consultant may require, consistent with Contract Documents.
- 6.6.** Reviewed and accepted samples will become standard of workmanship and material against which installed work will be verified.
- 6.7.** Samples are specified for submission under the following Sections:

Section 07 41 43 Aluminum Composite Panels

Section 07 46 13 Preformed Metal Siding

Section 08 14 10 Wood Doors

Section 08 50 50 Aluminum Windows

Section 09 30 13 Ceramic Tile

Section 09 51 13 Acoustical Ceiling Units

Section 09 65 19 Resilient Tile Flooring

Section 12 21 13 Horizontal Blinds

Section 12 21 16 Roller Shades

Refer to Mechanical & Electrical Divisions for sample requirements in those Trades.

7. Record Drawings

- 7.1.** Record, as the Work progresses, changes and deviations in the location of Work concealed by the finished Work, and such other approved changes that occur during progress of Work, to ensure that an accurate record is provided for future maintenance and alterations.
- 7.2.** White prints will be provided by the HRCE for use in preparing record drawings. Record changes in the Work on these prints in red ink.
- 7.3.** Dimension location of concealed Work in reference to building walls, and elevation in reference to floor elevation. Indicate at which point dimension is taken to conceal Work. Dimension all terminations and offsets of runs of concealed work.
- 7.4.** Record work constructed differently than shown on Contract Documents, changes in the work caused by site conditions, by Owner, Consultant, Contractor and Subcontractor originated changes, and by site instructions, supplementary instructions, field orders, change orders, addenda, correspondence and directions of jurisdictional authorities.

- 7.5.** Record location of mechanical and electrical services, piping, valves, conduits, pull boxes, junction boxes and similar work not clearly in view, and position of which is required for maintenance, alteration work and future additions. Do not conceal critical work until its location has been recorded.
- 7.6.** Identify record drawings as a "Project Record Copy". Maintain in good condition, do not use for construction purposes and make available to Consultant at all times.
- 7.7.** Submit record drawings at completion of Work. Final acceptance of the Work will be predicated on receipt and approval of record drawings.

8. Extra Stock

- 8.1.** Supply extra stock at completion of Project as specified in other Sections of the Project Manual.
- 8.2.** Deliver extra stock as directed by the Architect to location he designates.
- 8.3.** Extra stock is specified to be supplied in the following Sections:

Section 09 30 13 Ceramic Tile

Section 09 51 13 Acoustical Ceiling Units

Section 09 65 19 Resilient Tile Flooring

Section 09 91 23 Painting

Refer to Mechanical & Electrical Divisions for Extra Stock requirements in those Trades.

1. Maintenance Manual & Operating Instructions

- 1.1.** Submit three (3) copies of Maintenance Manual with application for completion certificate.
- 1.2.** Include in Maintenance Manual one (1) copy of each final approved shop drawing issued for Project on which have been recorded changes made during fabrication and installation caused by unforeseen conditions.
- 1.3.** Submit extended guarantees together in one (1) report binder.
- 1.4.** The Manuals shall:
 - 1.4.1.** Consist of a hard-cover, black, vinyl-covered, loose-leaf, letter-size binder.
 - 1.4.2.** Have a title sheet, or sheets preceding data on which shall be recorded Project name, Project number, date, list of contents, and Contractor's and Subcontractors' names.
 - 1.4.3.** Be organized into applicable Sections of Work with each Section separated by hard paper dividers with plastic covered tabs marked by Section.
 - 1.4.4.** Contain only typed or printed information and notes, and neatly drafted drawings.
 - 1.4.5.** Contain maintenance and operating instructions on all building, and mechanical and electrical equipment.
 - 1.4.6.** Contain maintenance instructions as specified in various Sections.
 - 1.4.7.** Contain brochures and parts lists on all equipment.
 - 1.4.8.** Contain sources of supply for all proprietary products used in the Work.

- 1.4.9. Contain lists of supply sources for maintenance of all equipment in Project of which more detailed information is not included above.
- 1.4.10. Contain finished hardware schedule.
- 1.4.11. Contain charts, diagrams and reports specified in Mechanical & Electrical Divisions.

2. Extended Warranties

- 2.1. Submit the extended warranties listed in this Article and as specified in each applicable Section of this Project Manual.
- 2.2. Extended warranties shall commence on termination of the standard one-year warranty granted in this Contract.
- 2.3. Submit each extended warranty on a standard Form of Warranty, a sample of which is included in this Section.
- 2.4. Secure each extended Warranty by a Maintenance Bond in an amount indicated.

3. Inspection Laboratory Reports

- 3.1. Submit copies of inspection and test reports obtained by the Contractor and Subcontractors for their Work or for Jurisdictional Authorities, if requested by Consultant.
- 3.2. Submit reports in accordance with requirements specified in Section 01 41 00.

4. Documentation On Suppliers & Manufacturers

- 4.1. Provide information under headings identifying the following: Associated Technical Section, Manufacturer, Supplier, Contact Name, and Phone Numbers.

SAMPLE FORM OF WARRANTY FOLLOWS THIS PAGE

Sample Form for Warranty

Date

Client

Project

Warranty
(title of work)

We hereby undertake to warrant all materials supplied and installed under our Contracts and include the providing of necessary materials and labour to cover the result of faulty materials or workmanship. Upon written notification from Client or the Architect that the above work is defective any repair or replacement work required shall be to the Architect's satisfaction at no cost to the Client. This Warranty shall not apply to defects caused by the work of others, maltreatment of materials, negligence or Acts of God. This Warranty shall remain in effect for the total period from the acceptance of the Work to (....date....), irrespective of the date of completion or the beneficial use by the Owner.

Signature

Authorized Signing Officer

Name of Firm

Address

END OF SECTION 01 33 00

SECTION 01 35 13 – APPENDIX A - SPECIAL PROJECT PROCEDURES

1. Introduction

- 1.1. School construction, renovation and maintenance projects are scheduled every year as a normal and necessary course of business by operations departments in each Nova Scotia Centre for Education. Building modifications, repairs and additions/demolitions to buildings may impact the school environment without appropriate controls. With increased controls based primarily on the CSA standards implementation, proper scheduling and clear communication on adequate controls can be put into place to eliminate/minimize the impact to all occupants.
- 1.2. Projects of this nature may generate varying levels of dusts, noises and odors. It is possible, unknown/unforeseeable environmental contaminants, such as spills, mold, fumes, lead or asbestos exposure maybe identified.
- 1.3. To successfully complete work within the school environment, it is necessary to plan and implement appropriate containment and control strategies. This document is developed to provide a minimum standard for contaminant controls for various types of projects in schools. These standards are in addition to and should complement all legislated protocols for working with regulated materials such as asbestos, lead paints, PCB's etc.
- 1.4. Executing a successful project will depend primarily on clear, concise communication. This may involve a number of parties (Project Manager, Operations staff, School Administration and Health & Safety staff and Joint Occupational Health & Safety Committee).

2. Communication Plan

- 2.1. The most critical element of any project management plan is effective communication between all stakeholders. Communication between the Operations project manager/supervisor, the contractor and school administrators before the start of a project is very important. This meeting is meant to explain the scope, schedule and risk assessment for the project. The meeting will also help establish clear expectations when managing planned and unplanned exposure risks associated with contaminant controls.
- 2.2. The communication plan shall include:
 - 2.2.1. A description of potential contaminants, which may include but is not limited to:
 - 2.2.1.1. Particulates (dirt, concrete/silica, steel, fiberglass, wood dust, ash, cellulose, etc.)
 - 2.2.1.2. Moisture: external water infiltration, internal system leaks (domestic water, sanitary, storm, sprinkler)
 - 2.2.1.3. Noise from equipment/tool operation,
 - 2.2.1.4. Fumes/odors from equipment exhaust, boiler exhaust, septic waste, chemical/adhesives, etc.

- 2.2.1.5. Hazardous materials including, asbestos, PCB, mercury, lead, fuel oil, fungi/mould, etc.
 - 2.2.1.6. Excessive heat/cold
 - 2.2.2. A description of the control measure which may include but not be limited to:
 - 2.2.2.1. Isolation within an enclosure (water, noise, hazardous materials)
 - 2.2.2.2. Ventilation and filtration
 - 2.2.2.3. Dehumidifiers/blowers (moisture)
 - 2.2.2.4. Personal protective equipment
 - 2.2.2.5. Schedule outside or inside school hours
 - 2.2.2.6. Sound dampeners
 - 2.2.2.7. Monitoring
 - 2.2.2.8. Security
 - 2.2.3. Other Hazards created by the work, including but not limited to fire safety and the need to alter fire safety plans.
 - 2.3. For small routine work orders the communication plan may only involve one tradesperson and the school principal or designate. This communication is equally as important for management of contaminant controls.

3. Contaminant Control Management

- 3.1. Regardless of the contaminant or control measure used, the following procedures shall apply for every project:
 - 3.1.1. Every project, including all routine work requests, shall be assessed, as per this document, by appropriate personnel for potential contaminant risk.
 - 3.1.2. Clear lines of communication must be established between project personnel, site supervisor or project manager and the school administration.
 - 3.1.3. Control strategies as per this document, shall be, communicated to workers as well as the site JOHSC and implemented prior to starting the work.
 - 3.1.4. Where isolation is used as a control, all entry points must be clearly posted to describe the purpose of the enclosure and limitations of access.
 - 3.1.5. During the execution of the project, the control measures must be regularly inspected and maintained before the start of each work shift, and throughout the shift as required.
 - 3.1.6. A process for stop work and remediation orders must be established to ensure the project manager; site supervisor and school administrator have a means to cease project operations when a contaminant control breach may impact the school environment. Breached control measures must be reported immediately to HRCE project manager upon discovery. He/she will be responsible to communicate to the school principal or designate. Work shall be stopped immediately until the control measures are re-established.

- 3.1.7.** Access to the controlled work site is only permitted by authorized personnel. The project supervisor or designate shall determine appropriate personal protective equipment (PPE) and necessary worker orientation.

4. Particulate Control

- 4.1.** Exposure to minimal levels of dust is a normal condition in most outdoor and indoor environments and is typically controlled inside a building through building ventilation, filtration and routine housekeeping measures. However, as noted, construction projects generally create elevated dust levels in work areas, whether inside or outside of a building.
- 4.2.** Operational Services Managers must ensure maintenance staff and contracted service providers implement dust control measures appropriate for the type and scope of work being performed. This will include assessing the type and amount of dust being created as well as the location of the work being conducted.
- 4.2.1.** Interior Construction Projects:
- 4.2.2.** Construction projects may be described as projects that may include window replacement, wall creation/demolition, etc.
- 4.3.** As a minimum for these types of construction projects, all interior entry points into a construction zone must be effectively sealed. The barrier must prevent contaminants from the work area to be distributed to other areas of the school. Appropriate signage must be posted to indicate only authorized persons are permitted access.
- 4.4.** Entrance design could range from a two flap plastic tarp door to a fully constructed sealed entry door with negative hepa-filtered ventilation on the construction side of the barrier.
- 4.5.** Exterior Construction Projects:
- 4.5.1.** Exterior work shall be performed so as not to affect the safety of building occupants. It will also provide controls to avoid impact to adjacent properties. Depending up on the results identified in the risk assessment, at a minimum consideration must be given to prevent dust from entering into the school environment. This may be controlled through isolation, dampening application, closing building AHU and window/door openings.

5. Noise Control

- 5.1.** Hearing plays an essential role in communication, speech and language development and learning within a school environment. During construction the contractor is responsible for ensuring acceptable noise levels will be adhered to for the HRCE staff and students within the building. Noise related to a project may prove to be very distracting for staff and students. To minimize distractions and interruptions in student learning the following are important to consider:
- 5.1.1.** Contractors are responsible to ensure appropriate noise control measures are taken
- 5.1.2.** "No work" periods may need to be incorporated into construction schedules

- 5.1.3. Work causing a noise disruption may need to take place during unoccupied times and/or during pre-determined acceptable times of the day (i.e. before and after class times)
- 5.1.4. It may be necessary for the School Administrator to make a request to the HRCE Project Manager or the Contractor to exclude undertaking certain noisy activities during particular periods and/or activities.

6. Moisture Control

- 6.1. Moisture levels are to be controlled during construction and maintenance activities. Moisture levels above normal may impact the air in the room and/or building and may also penetrate building materials giving the potential to lead to mould growth.
- 6.2. Certain activities (i.e. tape and mud of drywall, painting, pressure washing, concrete cutting with water or other water-based dust-suppression) introduce high amounts of moisture into the room environment and ventilation and or drying is required to control local moisture.
- 6.3. An enclosure properly set-up to contain other contaminants will similarly contain/control high levels of airborne moisture. A wet-vac should be available on-site for activities which have a risk of water spillage of more than 5 gallons at any instance.
- 6.4. Standing and or stagnate water must be avoided on construction sites, for a number of reasons, including, but not limited to; insects breed in these bodies of water, the water may give off odours, it is a nuisance to walk through, and it may be an ice hazard in cold weather.
- 6.5. It is important that all water leaks and flooding are reported immediately to the HRCE's project manager and building supervisor. Where works to existing "plumbing" is to occur the water lines (potable, heating, fire suppression) must be isolated and drained (de- energized/de-pressurized) following Lock Out - Tag Out procedure. Adequate supplies such as buckets and absorbents should be present when drains are not available to drain a line.
- 6.6. When an interruption to the water supply, potable or service, is to occur then the "owner's representative" and building supervisor should be notified 24 hours in advance. Bottled water provision may be required.
- 6.7. Materials used in the construction and or maintenance activities are to be stored in dry areas. The introduction of materials to the activities with moisture levels above the acceptable (XXX%)CNBC states for wood, on dry weight basis, a max of 19%, I can't find info on drywall but assume it is much lower range is prohibited as these materials are highly susceptible to colonization by mould spores.

7. Fumes

- 7.1. Fumes may be produced on a project site for a variety of reasons such as use of motorized equipment, off gassing of sealants, adhesives and finish products, cutting/torching processes, exposure of sanitary systems, process ignition gases such as propane and acetylene, proximity of project temporary washrooms, radon, etc.
- 7.2. The impact of fumes on occupants may range from discomfort to health risk, to life safety risk.

- 7.3. The project manager or supervisor must ensure that all potential fume sources are identified and remedial or control measures included in the scope of work by the contractor.
- 7.4. Monitoring equipment may be required to determine for example radon exposure or safety of confined space access.

8. Activity Assessment

- 8.1. Activities that may produce contaminants which require control may be considered as low, medium and high impact.
- 8.2. Low impact activities include routine maintenance and repairs that may create localized dust or odors or brief periods of noise which are not considered harmful to occupants but may be a nuisance which requires minimal control. These may include activities such as opening ceiling tiles or gyproc walls, replacing a plumbing fixture, paint touch ups, drilling through a wall, etc.
- 8.3. Medium impact activities include larger repair jobs or longer duration projects that will create more wide spread levels of contaminant which must be controlled to prevent exposure to building occupants. Boiler cleaning, ceiling replacement, long periods of hammer drilling, etc.
- 8.4. High impact activities include large demolition and construction projects, or jobs with exposure to contaminants that are a risk to health or life safety such as asbestos remediation, mould abatement, lead paint clean up, etc.

9. Hazard Assessment

- 9.1. A hazardous assessment is required to be completed for each job to ensure hazards are identified and corresponding controls are implemented. Depending upon the circumstances at the site it may be necessary to upgrade and/or add other precautions.
- 9.2. Determine the most appropriate hazard classification and apply the corresponding protocols. The attached hazard assessment identifies the minimum controls that must be in place during the corresponding activities. Depending on the specific circumstances at a site further controls may be required. When the hazards are deemed to be in the C or F category the form including specific controls must be submitted to the HRCE for review, prior to commencing work. The contractor may still be required to complete their own hazard assessment of the job/work.

10. Contaminant Controls Procedure for initiating work for all Contaminant Controls:

10.1. Contaminant Control I

- 10.1.1. The tradesperson or project manager for the HRCE will discuss the details, including the scope and any impacts of the job/project with the principal.
- 10.1.2. Ensure fire exiting requirements and life safety systems are addressed or adequate mitigating plans are implemented for the building, construction staff and building occupants.
- 10.1.3. Presence of lead paint or ACM's (Asbestos Containing Materials) must be determined prior to the start of any job. Specific protocols or Codes of Practice may apply.

- 10.1.4. Consideration will be given for work that is anticipated to generate significant noise, odours or VOC's (Volatile Organic Compounds) and this will be scheduled outside of school hours or during times when the noise will not disrupt occupant activities. This will require coordination with the Principal.
- 10.1.5. The work area shall be isolated where possible. This may be achieved at varying levels, by closing doors and opening outside windows for ventilation or by installing appropriate hoarding and negative pressure units to ensure contaminants are not circulated throughout the school causing further health and safety concerns.
- 10.1.6. Dust shall be minimized during the activity. When drilling, sanding or cutting is taking place, wetting the area may be necessary to reduce dust.
- 10.1.7. Good housekeeping practices shall be maintained at all times on the work site. Bag and remove dust and debris from the building as soon as possible.
- 10.1.8. Possible environmental impacts shall be managed and minimized. If work uncovers environmental contaminants or suspected contaminants such as oil spills (current or historic) or potentially friable asbestos materials (check the school asbestos audit) that may be disturbed, this information shall be brought to the attention of the HRCE's employee responsible for the project so that appropriate actions can be taken.
- 10.1.9. When the activity is completed the work area shall be inspected and cleaned. Dust and debris shall be removed from the area and all efforts will be made to return items to their pre-maintenance activity location.
- 10.1.10. The Principal shall be notified that the work is completed.
- 10.2. **Contaminant Control II** - All Contaminant Control I measures shall apply, as well as;
 - 10.2.1. Cover furniture, bookshelves and teaching materials with plastic sheets.
 - 10.2.2. Water misting while performing dust generating activities may be required.
 - 10.2.3. Seal un-used doors. Seal wall penetrations, electrical outlets, or any other source of air leaks in the construction area.
 - 10.2.4. Seal exhaust air vents in construction area and open the windows. If possible shut down air handling system in the area for duration of project.
 - 10.2.5. A walk out mat at exterior of exit door to trap dust may be required.
- 10.3. **Contaminant Control III** - All Contaminant Control I and II measures shall apply, as well as;
 - 10.3.1. Install an impermeable dust barrier from the true ceiling to the floor consisting of two layers of 6 mil fire retardant polyethylene or solid wall and sealed door. The wall shall remain in place until the job is finished and the clean-up is completed.
 - 10.3.2. Seal all wall penetrations.
 - 10.3.3. Seal off all return and supply air handling ducts and close all windows.
 - 10.3.4. Turn off the air handling system in the area of construction.
 - 10.3.5. Maintain negative air pressure in the construction area using HEPA filter equipped exhaust ventilation. The pressure differential between the project area of contamination and the building's occupied areas shall be demonstrable by a means approved by the HRCE employee responsible for the project.

- 10.3.6. Ensure that the air is exhausted directly outside and away from intake vents.
- 10.3.7. Vacuum all horizontal surfaces including drop cloths with a hepa vacuum.
- 10.3.8. Remove drop cloths.
- 10.3.9. Vacuum again all horizontal surfaces with HEPA Vacuum.
- 10.3.10. Restore ventilation.
- 10.3.11. Remove enclosure and equipment.

10.4. Control IV: (External Work)

- 10.4.1. External work may impact building interior or occupants.
- 10.4.2. To reduce the impact to building interior or occupants, it may be necessary to contain the work area from impacting building interior. This may include closing or opening windows, tarping ceilings to capture debris or water, temporary relocation of occupants or ventilation controls.
- 10.4.3. The job supervisor shall consider weather conditions and forecast to reduce the effect of any weather impacts to the building materials or building occupants.
- 10.4.4. It may be necessary to use protective tarps and ground cover sheets below equipment and work areas to contain building debris such as paint chips, materials, dust or oil from equipment.
- 10.4.5. When the job is completed and the tarps have been lifted, inspect the ground around the job for debris and clean as necessary.

Fire Protection

10.5. Type V: General Fire Protection

- 10.5.1. Ensure fire exiting requirements and life safety systems are addressed or adequate mitigating plans are implemented for the building, construction staff and building occupants. Staff must be aware of temporary modifications to fire safety plans.
- 10.5.2. MSDSs for all materials to be used must be reviewed and available on site.
- 10.5.3. Construction materials stored outside must be a minimum distance of ten feet from the building and be in a secured area.
- 10.5.4. Flammable or Combustible liquids must be stored as per Fire Code requirements. All flammable and combustible liquids or materials must be kept in a secure area at all times.

10.6. Control VI: Fire Protection (minor hot work) - All Contaminant Control V shall apply as well as;

- 10.6.1. Notify the Principal that a risk of fire has increased and the area in which the hot work will occur.
- 10.6.2. Refer and implement the HRCE's hot work permit process. At a minimum the following should be considered;
 - 10.6.2.1. Sweep the work area and remove all unnecessary materials in the vicinity; particularly all combustible and flammable materials and liquids shall be removed from the area (35 feet).
 - 10.6.2.2. Have an appropriate size fire extinguisher available.

- 10.6.2.3.** Inspect the work location for areas (such as a hole in the wall) where hot material or sparks could fall and smolder and close them off so that any hot debris can only fall within your field of view.
- 10.6.2.4.** If it is possible that the flame will go past the object being welded or soldered and excessively heat a flammable or combustible material, then either protect that material with a non-flammable material or wet the material and keep it wetted during the use of heat or grinding.
- 10.6.2.5.** Remain in the area while the joint and/or heated materials cool to room temperature (ambient) while checking for the smell or appearance of smoke in the area.
- 10.6.2.6.** Stay in the area for at least 2 hours and then re-inspect for any smell or appearance of smoke.
- 10.6.2.7.** Ask another staff person to inspect the area for the smell or appearance of smoke. Record who you asked to do the final inspection.
- 10.6.3.** Type VII: Fire Protection (hot work w fire watch) - All Contaminant Control V and VI shall apply as well as;
- 10.6.4.** Notify the Principal that a risk of fire has increased and the area in which the hot work will occur. If any life safety system components (sprinkler, detectors, fire alarms) are not function, hot work should not proceed until these systems are functioning unless fire watch procedures for life systems are followed. See Activation of Fire Watch for Life Safety Systems checklist. Appendix...XX
- 10.6.5.** Refer and implement the HRCE's hot work permit process. At a minimum the following should be considered;
 - 10.6.5.1.** Cover all floor openings with fire stop material. Seal duct work openings with metal covers or blankets and close all doors.
 - 10.6.5.2.** Ensure that there are no potentially explosive atmospheres in the area.
 - 10.6.5.3.** Hot work on vessels, pressure tanks or boilers, use only contractors who are qualified by nationally or internationally recognized boiler and pressure vessel code.
 - 10.6.5.4.** Notify the local fire department of the type of work and the work schedule.
 - 10.6.5.5.** Before hot work is started, designate one employee responsible to complete the fire watch: while work is in progress, during lunch breaks and other breaks and for one hour after all flames are extinguished for the day and monitor the area for an additional two hours. After three hours after the last flame has been extinguished, have a second employee do a final survey of the area for smells or evidence of smoldering or fire and record the inspection.

**APPENDIX
Fire Watch Activation Checklist**

1. Documentation (identify locations to be checked on an hourly basis, provide contact information for relevant HRCE staff and outside agencies} HRCE provided template to be used for documentation.
2. Procedure reviewed with Custodian or individual responsible for fire watch. Any high-risk areas shall be identified to be highlighted on the documentation page and checked during the rounds.
3. Staff working in the building have been notified of the Fire Watch and that they are responsible to monitor areas for signs of fire or smoke and have been reminded of required actions to take according to the school fire safety plan.
4. Staff responsible for fire watch have been trained in how to use a fire extinguisher. (PASS)
5. Staff responsible for the fire watch have a means of communication (cell phone or walkie-talkies)
6. Staff responsible for the fire watch are aware of the procedure for initiating fire alarm and what systems are functioning. i.e. systems (sprinklers, alarm panel or if school has monitoring company or if calling 911 is required)
7. The School Insurance Program (SIP) Emergency Information Line has been notified 1-902-448-2840
8. All relevant information has been documented in the school's fire books. Including date, time and reason for fire watch.

Fire Watch De-Activation Checklist

1. Document the date, time and actions taken to remedy the deficiency requiring the fire watch.
2. School Insurance Program (SIP) has been notified.
3. Copy of the Fire Watch documentation is kept in the fire book and the original is sent to the HRCE Project Representative.

END OF SECTION 01 35 13

SECTION 01 35 29 - OCCUPATIONAL HEALTH & SAFETY REQUIREMENTS

1. References

- 1.1. CSA S269.1-1975 Falsework for Construction Purposes.

2. CONSTRUCTION SAFETY MEASURES

- 2.1. Observe construction safety measures of:
 - 2.1.1. National Building Code 2010, Part 8
 - 2.1.2. National Fire Code of Canada
 - 2.1.3. Provincial Government, including but not limited to the:
 - 2.1.3.1. Occupational Health & Safety Act revised Statutes of Nova Scotia 1996, Chapter 7 and regulations.
 - 2.1.3.2. Workers' Compensation Act
 - 2.1.3.3. Fire Protection Act
 - 2.1.3.4. Dangerous Goods Transportation Act
- 2.2. In case of conflict or discrepancy the more stringent requirement shall apply.
- 2.3. Ensure that employees working on this specific project have met training requirements as legislated by the Nova Scotia Occupational Health & Safety Act and its regulations.
- 2.4. Where reference is made to jurisdictional authorities, it shall mean all authorities who have within their constituted powers the right to enforce the laws of the place of the building.

3. Equipment & Tools

- 3.1. Each user of equipment or tools shall be responsible to examine for sufficiency before use. Make equipment and tools safe if necessary.

4. WHMIS

- 4.1. 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.
- 4.2. Have a copy of WHMIS data sheets available at the workplace on delivery of materials.

5. Hazardous Material

- 5.1.** Should material resembling hazardous materials other than those identified with the Contract Documents, including but not limited to spray or trowel applied asbestos, be encountered in course of work; stop work immediately. Do not proceed until written instructions have been received from Consultant.
- 5.2.** Where work entails use, storage, or disposal of toxic or hazardous materials, chemicals and or explosives, or otherwise creates a hazard to life, safety, health, or the environment; work shall be in accordance with the Jurisdictional Authority.

6. Site Cleaning

- 6.1.** Except where special permission is obtained, maintain clear access on public sidewalks and roads.
- 6.2.** Maintain walks and roads clear of construction materials and debris, including excavated material. Clean walks and roads as frequently as required to ensure that they are cleared of materials, debris and excavated material.

7. Fire Safety Requirements

- 7.1.** Enforce fire protection methods, good housekeeping and adherence to local and Underwriter's fire regulations including, but not limited to, Fire Protection Act and the Provincial Building Code Act. Provide UL approved fire extinguishers, and other fire- fighting services and equipment, except where more explicit requirements are specified as the responsibility of individual Sections.
- 7.2.** Smoking is not permitted on school property.
- 7.3.** Advise Fire Chief in the area of Work of any work that would impede fire apparatus response, including but not limited to violation of minimum overhead clearance prescribed by the fire chief, erecting of barricades and digging of trenches and in areas where work is being done.
- 7.4.** Ensure nothing subverts the integrity of fire protection provided for the building structure.

8. Reporting Fires

- 8.1.** Know the location of the nearest fire alarm box and telephone, including the emergency phone number.
- 8.2.** Report immediately all fire incidents to the fire department as follows:
 - 8.2.1.** Activate nearest fire alarm box, or
 - 8.2.2.** Telephone local fire department
 - 8.2.3.** Where fire alarm box is exterior to building, the person activating the fire alarm box shall remain at the box to direct Fire Department to scene of the fire.
 - 8.2.4.** When reporting a fire by telephone, give location of fire, name or number of building and be prepared to verify the location.

9. Safety Document Submission

- 9.1.** Ensure Safety Document Submission applies to Work of this specific project and site.
- 9.2.** Submit two (2) copies of Project Safety Document at the Pre-Construction Meeting. Do not commence Work nor deliver material on-site prior to submission.
- 9.3.** Include in Safety Document submission specific information detailing the methods and procedures to be implemented ensuring adherence to the acts, regulations, codes and policies specified in this section and to:
 - 9.3.1.** Ensure the Health & Safety of persons at or near the Work; including, but not limited to, the Public.
 - 9.3.2.** Ensure the measures and procedures of the regulatory agencies specified are carried out.
 - 9.3.3.** Ensure every employee, self-employed person and employer performing Work under this contract complies with the regulatory agencies specified.
 - 9.3.4.** Where changes to the methods and procedures in the execution of work change submitted safety methods and procedures, modify submitted Safety Documentation and submit modifications, in writing to the Consultant and Owner prior to implementation.

10. Safety Document Organization

- 10.1.** Organize information in the form of an instructional manual as follows:
 - 10.1.1.** Place in binders of commercial quality, accommodating 8½" x 11" paper size.
 - 10.1.2.** Cover: Identify binder with typed or printed title 'Project Safety Document' and list the title of project.
 - 10.1.3.** Provide tabbed fly leaf for each separate heading, with typed heading on tab.
 - 10.1.4.** Where drawings are within the safety document, provide with reinforced punched binder tab. Bind in with text; fold in larger drawings to size of text pages.
 - 10.1.5.** Arrange content under Safety Document headings specified herein.

11. Safety Document Headings

11.1. Employee Safety Training

11.1.1. Place, under this heading, a statement indicating employees working on this specific project have met specified training requirements, if required.

11.2. Company Safety Policy

11.2.1. Place, under this heading, information pertaining to the company's policy and commitment to Occupational Health & Safety, including the responsibilities of management, supervisors and workers.

11.3. Company Safety Rules in General Terms

11.3.1. Place, under this heading, information of a general, global nature, applying to every work environment where the company has staff and pertaining to rules directing compliance to policy. For example state company safety rules with respect to use of hard hats, safety glasses, safety foot ware, CSA approval on such items, and use of alcohol or non-prescription drugs.

11.4. Hazard Assessment

11.4.1. Place, under this heading, information identifying possible hazards specific to this project and identify safe methods and procedures for the execution of work to ensure safety in the workplace.

11.4.2. Arrange contents of this heading by technical section number of the project manual.

11.5. Emergency Action Plan

11.5.1. Place, under this heading, information detailing action to be taken in the event of various emergencies.

11.5.2. Arrange content under the following sub-headings:

11.5.2.1. First Aid

11.5.2.1.1. Include information concerning establishment of a First Aid Station, related supplies, staff awareness of location and staff training in First Aid Care of Casualties.

11.5.2.2. Contact of Emergency Support Groups:

11.5.2.2.1. Include relative information including phone location for emergency use, the emergency telephone numbers and their location for the various organizations which must be contacted in case of an emergency, and staff training in procedures.

Cessation of Work:

11.5.2.2.2. Include relative information how work cessation during emergencies is handled and communicated to persons present on site.

11.6. Joint Occupational Health & Safety Committee/Representative:

11.6.1. Place under this heading information detailing membership and terms of reference.

OCCUPATIONAL HEALTH & SAFETY SUMMARY FOLLOWS THIS PAGE

Occupational Health & Safety Summary (to be submitted with each monthly Progress estimate)

The following information summarizes Occupational Health & Safety activities on the project conducted by the Contractor during the month and includes activities of Subcontractors. Activities include all matters prescribed by the Occupational Health & Safety Act and Regulations and the submitted Occupational Health & Safety Document for the Project.

Indicate the applicable # number below:

_____ new contractors on site,

_____ orientations

_____ toolbox talks

_____ safety meetings

_____ Joint Occupational Health
and Safety Committee meetings

_____ hazard assessments

_____ formal written inspections

_____ warnings issued to employees or subcontractors

_____ other, explain _____

List new Contractors on Site below:

The Contractor certifies that the above noted activity list is accurate and that during the month:
Check

☐

All activities on the Project were found to be in compliance with the Occupational Health & Safety Act and Regulations

☐

Some activities on the Project were not found to be in compliance with the Occupational Health & Safety Act and Regulations but were adequately corrected in an appropriate time frame. Explain

Prepared by

Certified by

(Contractor Project Manager)

(Contractor Senior Management)

END OF SECTION 01 35 29

SECTION 01 37 00 - SCHEDULE OF VALUES

1. Related Documents

- 1.1.** General Conditions of Contract.

2. General

- 2.1.** Submit to the Architect, and Owner, Schedule of Values, within twenty (20) days after signing Agreement.
- 2.2.** Use Schedule of Values as basis for Contractor's Progress Claim.

3. Form Of Submittal

- 3.1.** Form included at end of this Section.

4. Preparing Schedule Of Values

- 4.1.** Itemize separate line item cost for work required.
- 4.2.** Round off figures to nearest ten (10) dollars.
- 4.3.** The sum of all values listed in the schedule shall equal the total contract sum.

5. Review And Submittal

- 5.1.** After review by Architect and Owner, revise and resubmit Schedule as directed.
- 5.2.** The form shall be completed and supported by such evidence as to its correctness as the Architect may reasonably direct.

SCHEDULE OF VALUES

Project Name ***#4278 – Exterior Envelope Renewal – Harrietsfield Elem***

Architect

Contractor

Date

Halifax Regional Centre for Education – Schedule of Values		
Contract Item	Percentage	Dollar Value
Mobilization, bonding / insurance, safety, set up safety fencing and roof access	5	
Materials - approved materials delivered to site . Approved area by HRCE	35	
Removal of existing roof system and install to new vapour barrier	15	
Install Roof System	30	
Metal Flashings	10	
Close out documentation including copy of warranty	5	
Total	100 %	

END OF SECTION 01 37 00

SECTION 01 41 00 - REGULATORY AGENCIES

1. Jurisdictional Authorities

- 1.1. Where reference is made to jurisdictional authorities, it shall mean all authorities who have within their constituted powers the right to enforce the laws of the place of building.

2. Definitions

- 2.1. The "Constructor" named in the Construction Safety Act, Chapter 52, Revised Statutes of Nova Scotia, as amended by 1972, Chapter 25; and Construction Safety Regulations, pursuant to Chapter 52 R.S.N.S., including any amendments, shall mean the "Contractor" for the Work performed under this Specification.

3. Fire Prevention, Safety & Protection

- 3.1. General Construction Safety Measures:
 - 3.1.1. Observe safety measures of the
 - 3.1.1.1. National Building Code 2010, Part 8.
 - 3.1.1.2. National Fire Code of Canada.
 - 3.1.1.3. Provincial Government, including but not limited to the Occupational Health & Safety Act Revised Statutes of Nova Scotia 1996, Chapter 320, and the Construction Safety & Industrial Safety Regulations made pursuant to the Occupational Health and Safety Act, 1996.
 - 3.1.1.4. Workers'/Workmen's Compensation Board.
 - 3.1.2. In case of conflict or discrepancy the more stringent requirement shall apply.
 - 3.1.3. Maintain clear emergency exit paths for personnel.
- 3.2. Except where special permission is obtained, maintain clear access on public sidewalks and roads.
- 3.3. Maintain walks and roads clear of construction materials and debris, including excavated materials. Clean walks and roads as frequently as required to ensure that they are cleared of materials, debris and excavated materials.
- 3.4. WHMIS:
 - 3.4.1. 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 Labour Canada and Health & Welfare Canada.
 - 3.4.2. Have a copy of WHMIS data sheets available at the workplace on delivery of materials.

Blockage of Roadways

- 3.5. Advise Fire Chief of any work that would impede fire apparatus response. This includes violation of minimum overhead clearance, as prescribed by fire chief, erecting of barricades and the digging of trenches.

4. Smoking Precautions

- 4.1. Observe, at all times, smoking regulations.

5. Rubbish And Waste Materials

- 5.1. Rubbish and waste materials are to be kept to a minimum.
5.2. The burning of rubbish is prohibited.

6. Flammable And Combustible Liquids

- 6.1. The handling, storage and use of flammable and combustible liquids are to be governed by the current National Fire Code of Canada.
6.2. Flammable and combustible liquids such as gasoline, kerosene and naphtha will be kept for ready use in quantities not exceeding 45 litres provided they are stored in approved safety cans bearing the Underwriter's Laboratory of Canada or Factory Mutual seal of approval. Storage of quantities of flammable and combustible liquids exceeding 45 litres for work purposes, requires the permission of the Fire Chief.
6.3. Transfer of flammable and combustible liquids is prohibited within buildings or jetties.
6.4. Transfer of flammable and combustible liquids will not be carried out in the vicinity of open flames or any type of heat-producing devices.
6.5. Flammable liquids having a flash point below 38°C such as naphtha or gasoline will not be used as solvents or cleaning agents.
6.6. Flammable and combustible waste liquids, for disposal, will be stored in approved containers located in a safe ventilated area. Quantities are to be kept to a minimum and the Fire Department is to be notified when disposal is required.

7. Hazardous Substances

- 7.1. Work entailing the use of toxic or hazardous materials, chemicals and/or explosives, otherwise creates a hazard to life, safety or health, will be in accordance with the National Fire Code of Canada.
7.2. Where flammable liquids, such as lacquers or urethanes are to be used, proper ventilation will be assured and all sources of ignition are to be eliminated. The Fire Chief is to be informed prior to and at the cessation of such work.

8. Questions and/or Clarification

- 8.1. Direct any questions or clarification on Fire Safety in addition to above requirements to Fire Chief.

9. Fire Inspection

- 9.1. Site inspections by Fire Chief will be coordinated through HRCE Project Manager.
- 9.2. Allow Fire Chief unrestricted access to the work site.
- 9.3. Co-operate with the Fire Chief during routine fire safety inspection of the Work site.
- 9.4. Immediately remedy all unsafe fire situations observed by the Fire Chief.

10. Reference Standards

- 10.1. Where edition date is not specified, consider that references to manufacturer's and, published codes, standards and specifications are made to the latest edition, (revision) approved by the issuing organization, current at the date of this Specification.
- 10.2. Reference standards and specifications are quoted in this Specification to establish minimum standards. Work which in quality exceeds these minimum standards shall be considered to conform.
- 10.3. Should the Contract Documents conflict with specified reference standards or specifications the General Conditions of the Contract shall govern.
- 10.4. Where reference is made to manufacturer's directions, instructions or specifications they shall include full information on storing, handling, preparing, mixing, installing, erecting, applying, or other matters concerning the materials pertinent to their use and their relationship to materials with which they are incorporated.
- 10.5. Have a copy of each code, standard and specification, and manufacturer's directions, instructions and specifications, to which reference is made in this Specification, always available at construction site.
- 10.6. Standards, specifications, associations, and regulatory bodies are generally referred to throughout the specifications by their abbreviated designations:

AA	The Aluminum Association
AISI	American Iron and Steel Institute
ANSI	American National Standards Institute
ARI	Air Conditioning & Refrigeration Institute
ASTM	American Society for Testing & Materials
CCA	Canadian Construction Association
CGSB	Canadian General Standards Board
CSA	Canadian Standards Association
NSDTIR	Department of Transportation & Infrastructure Renewal, Province of Nova Scotia
IAO	Insurers Advisory Organization
NBC	National Building Code
NFPA	National Fire Protection Association
CANS	Construction Association of Nova Scotia
ULC	Underwriters Laboratories of Canada
WHMIS	Workplace Hazardous Materials Information System

END OF SECTION 01 41 00

SECTION 01 45 00 - QUALITY CONTROL

1. Section Includes

- 1.1. Inspection and testing, administrative and enforcement requirements
- 1.2. Tests and mix designs.
- 1.3. Mock-ups.
- 1.4. Mill tests.
- 1.5. Equipment and system adjust and balance.
- 1.6. Verification by affidavits and certificates that specified products meet requirements of reference standards: In applicable Sections of the Specification.
- 1.7. Testing, balancing and adjusting of equipment: In applicable Mechanical and Electrical Sections of the Specification.
- 1.8. Cutting & Patching: Section 01 11 41.

2. Related Sections

- 2.1. Section 01 33 00 Submittal Procedures: Submission of samples to confirm product quality.
- 2.2. Section 01 61 00 Material & Equipment: Material and workmanship quality – reference standards.
- 2.3. Section 01 77 00 Contract Closeout.

3. REVIEW OF WORK

- 3.1. The Owner shall have access to the Work. If part of the Work is in preparation at locations other than the Place of the Work, access shall be given to such work whenever it is in progress.
- 3.2. Give timely notice to the Owner's Representative, requesting review of the Work as indicated in the Contract Documents.
- 3.3. If the Contractor covers or permits to be covered Work that has been designated for review by the Owner before such is made, uncover such Work, have the review satisfactorily completed and make good such Work at no extra cost to Owner.

4. Inspection, Special Tests, Approvals

- 4.1. Engage the services of appropriate inspection testing agencies ensuring the Work meets codes, acts and regulations, and laws in force at the place of Work. Include such costs in the Contract Price.

- 4.2.** Give timely notice requesting inspection to those required to provide inspections, special tests, or approvals, where Work is designated, by the Owner's instructions or the law of the place of Work, for special tests.
- 4.3.** If the 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 the inspections or tests satisfactorily completed and make good such Work at no extra cost to the Owner.
- 4.4.** The Owner may order any part of the Work to be examined if the Work is suspected to be not in accordance with the Contract Documents. If, upon examination such Work is found not in accordance with the Contract Documents, correct such Work and pay the cost of examination and correction. If such Work is found in accordance with the Contractor Documents, the Owner shall pay the cost of examination and replacement.

5. Independent Inspection Agencies

- 5.1.** Independent Inspection/Testing Agencies may be engaged by the Owner for the purpose of inspecting and/or testing portions of Work. Cost of such services will be borne by the Owner.
- 5.2.** Provide access to the Work, and equipment required for executing inspection and testing by the appointed agencies.
- 5.3.** Employment of inspection/testing agencies does not relax the Contractor's responsibility to perform Work, or carry out his own inspections and testing in accordance with the Contract Documents.
- 5.4.** If defects are revealed during inspection and/or testing, the appointed agency will request additional inspection and/or testing to ascertain full degree of defect. Correct defect and irregularities as advised by Owner at no cost to the Owner. Pay costs for retesting and reinspection.

6. Access To Work

- 6.1.** Allow inspection/testing agencies access to the Work, off site manufacturing and fabrication plants.
- 6.2.** Co-operate to provide reasonable facilities for such access.

7. Procedures

- 7.1.** Notify the appropriate agency and Owner in advance of the requirement for tests, in order that attendance arrangements can be made.
- 7.2.** Submit samples and/or materials required for testing, at specifically requested in specifications. Submit with reasonable promptness and in an orderly sequence so as not to cause delay in the Work.
- 7.3.** Provide labour and facilities to obtain and handle samples and materials on site. Provide sufficient space to store and cure test samples.

8. Rejected Work

- 8.1.** Remove defective Work, whether the result of poor workmanship, use of defective products or damage and whether incorporated in the Work or not, which has been rejected, including (but not limited to) defective Work rejected by the Owner as failing to conform to the Contract Documents. Replace or re-execute in accordance with the Contract Documents.
- 8.2.** Make good other Contractor's work damaged by such removals or replacements promptly.
- 8.3.** If in the opinion of the Owner, it is not expedient to correct defective Work or Work not performed in accordance with the Contract Documents, the Owner may deduct from the Contract Price the difference in value between the Work performed and that called for by the Contract Documents, the amount of which shall be determined by the Owner.

9. Reports

- 9.1.** Submit four (4) copies of inspection and test reports to the Owner.
- 9.2.** Provide copies to Contractor's Consultant and Subcontractor of Work being inspected or tested.

10. Tests and Mix Designs

- 10.1.** Furnish test results and mix designs as may be requested.
- 10.2.** The cost of tests and mix designs beyond those called for in the Contract Documents or beyond those required by law of the Place of Work shall be appraised by the Owner and may be authorized as recoverable.

11. Mock-Up

- 11.1.** Prepare mock-up for Work for each finish in the Work and other work specifically requested in the specifications. Include for Work of all Sections required to provide mock-ups.
- 11.2.** Construct in all locations as specified in specific Section.
- 11.3.** Prepare mock-up for Owner's review with reasonable promptness and in an orderly sequence, so as not to cause any delay in the Work.
- 11.4.** Failure to prepare mock-up in ample time is not considered sufficient reason for an extension of Contract Time and no claim for extension by reason of such default will be allowed.
- 11.5.** If requested the Owner will assist in preparing a schedule fixing the dates for preparation.
- 11.6.** Mock-ups may remain as part of the Work, unless specified otherwise in the Contract Documents.

12. Mill Tests

- 12.1.** Submit mill test certificates as may be requested.

13. Equipment And Systems

- 13.1.** Submit adjustment and balancing reports for mechanical, electrical and building equipment systems.
- 13.2.** Refer to Contract Documents for definitive requirements.

END OF SECTION 01 45 00

SECTION 01 52 00 – CONSTRUCTION & TEMPORARY FACILITIES

1. General

- 1.1. Include in the Work construction and temporary facilities required as construction aids or by jurisdictional authorities or as otherwise specified. Install to meet needs of construction as Work progresses. Maintain construction and temporary facilities during use, relocate them as required by the Work, remove them at completion of need and make good adjacent Work and property affected by their installation.
- 1.2. Include in the Work construction and temporary facilities to provide for construction safety such as: fences, barricades, bracing, supports, storage, sanitation and first aid facilities, fire protection, stand pipes, electrical supply, construction equipment with its supports and guards, stairs, ramps, platforms, runways, ladders, scaffolds, guardrails, temporary flooring, rubbish chutes, and walkway, morality and guard lights, and as otherwise required of the Constructor by the Construction Safety Act, of the Province of Nova Scotia, as well as all other applicable regulations or jurisdictional authorities.
- 1.3. Construct temporary Work of new materials unless use of second-hand materials is approved.
- 1.4. Ensure that structural, mechanical, and electrical characteristics of temporary facilities are suitable and adequate for use intended. Be responsible that no harm is caused to persons and property by failure of temporary facilities because of placing, location, stability, protection, structural sufficiency, removal, or any other cause.
- 1.5. Locate temporary facilities as directed and coordinated with School Administration and HRCE.
- 1.6. Relocate construction and temporary facilities as required by the Progress of the Work, and remove at completion of Work.
- 1.7. Do not permit construction personnel to use new washroom and toilet facilities.
- 1.8. Interior work zones to be complete with temporary negative air ventilation units to be functioning at all times to control dust migration to occupied areas.
- 1.9. Refer also to HRCE Policies & Guidelines contained in Appendix A of Section 01 35 13.

2. Services

- 2.1. Temporary Electric Power:
 - 2.1.1. The Contractor will provide a source of electric power for all construction purposes.
 - 2.1.2. Coordinate with the Building Operator locations of power sources and arrange to connect under his direction.
 - 2.1.3. Install electric service distribution conductors and necessary components. Determine anticipated demand which will be placed on service during normal peak periods and obtain approval on this basis before making installation. Supply power of characteristics required by the Work. Install a power centre for miscellaneous tools

and equipment for each major building floor area with distribution box, a minimum of four 20 amp grounded outlets, and circuit breaker protection for each outlet. Make connections available to any part of the Work within distance of a 100'-0" extension.

2.2. Temporary Lighting:

2.2.1. Install lighting for

2.2.1.1. emergency evacuation, safety and security throughout the Project at intensity levels required by jurisdictional authorities.

2.2.1.2. performance of Work throughout Work areas as required, evenly distributed, and at intensities to ensure that proper installations and applications are achieved.

2.2.1.3. performance of finishing Work in areas as required, evenly distributed and of an intensity of at least 15 foot candles.

2.2.2. Permanent fluorescent lighting may be used during construction, provided that fixtures, lamps and lenses are completely cleaned. Incandescent sources may be used during construction to the extent of 20% of the total. Electrical Division Contractor to provide 20% spare lamps to the Owner for replacement purposes.

2.3. Temporary Sanitary Facilities:

2.3.1. Provide sanitary facilities for persons on the Work site. Facilities in areas of the building are only to be used under extraordinary circumstances and with prior approval.

2.4. Maintain fire protection as required by jurisdictional authorities. The Contractor is responsible for de-activating and re-activating Fire Alarm zones as required by the Work of the Contract and to maintain protection in the existing building.

3. Construction Aids

3.1. Hoists & Cranes:

3.1.1. Select, operate and maintain hoisting equipment and cranes as may be required. Operate such equipment only by qualified hoist or crane operators. Make hoist available for Work of each Section.

3.2. Building Enclosure:

3.2.1. Include in Work temporary enclosure for building as required to protect it, in its entirety or in its parts, against the elements, to maintain environmental conditions required for Work. Design enclosures to withstand wind pressures required for the

building by jurisdictional authorities. Erect enclosures to allow complete accessibility for installation of materials during the time enclosures remain in place.

3.3. Scaffolding:

3.3.1. Each user of scaffolding shall be responsible for its examination and testing for sufficiency before using it. He shall make it secure if necessary, or shall notify the Contractor in writing that he will not commence work until it is made secure; otherwise he will be held responsible for accidents due to its insufficiency.

4. Barriers

- 4.1. Install barricades for traffic control, and to prevent damaging traffic over exterior and interior finished areas, as well as safety barricades and otherwise, as may be required.
- 4.2. Construct hoardings and walkways as required by HRCE or jurisdictional authorities.

5. Protection

- 5.1. Protect roofs and podiums by substantial temporary construction to ensure that no damage occurs. Provide protection by materials of sufficient thickness to prevent all damage to structure and finish, and to waterproofing qualities of membranes, whenever each of these individual components are exposed. Damage shall include harm resulting from all construction work, such as falling objects, wheel and foot traffic, failure to remove debris, operation of machinery and equipment, and scaffolding and hoisting operations. Positively secure protection to prevent displacement from any cause.
- 5.2. Box with wood or otherwise protect from damage, by continuing construction, finished sills, jambs, corners, and the like.

END OF SECTION 01 52 00

SECTION 01 61 00 - MATERIAL & EQUIPMENT

1. General

- 1.1.** Products refer to materials, manufactured components and assemblies, fixtures and equipment incorporated in the Work.
- 1.2.** Use only products of Canadian manufacture unless such products are not manufactured in Canada, are specified otherwise, or are not competitive.
- 1.3.** Products for use in the Project and on which the Tender was based shall be in production at that time, with a precise model and shop drawings available for viewing.
- 1.4.** Where equivalent products are specified, or where alternatives are proposed under "substitution of products", these products claimed by the Contractor as equivalent shall be comparable in construction, type, function, quality, performance, and, where applicable, in appearance, as approved. Where specified equivalents are used in the tendered bulk sum price for the Work, they shall be subject to final approval.
- 1.5.** Incorporate products in the Work in strict accordance with manufacturers' directions unless specified otherwise.
- 1.6.** Products delivered to the Project site for incorporation in the Work shall be considered the property of the Owner. Maintain protection and security of products stored on the site after payment has been made for them.
- 1.7.** Do not install permanently incorporated labels, trademarks and nameplates, in visible locations unless required for operating instructions or by jurisdictional authorities.

2. Specified Products

- 2.1.** Products specified by manufacturer's name, brand name or catalogue reference shall be the basis of the bid and shall be supplied for the Work without exception in any detail, subject to allowable substitutions as specified.
- 2.2.** Where several proprietary products are specified, any one of the several will be acceptable.
- 2.3.** For products specified by reference standards, the onus shall be on the supplier to establish that such products meet reference standard requirements. The Architect may require affidavits from the supplier, as specified in Section 01 33 00, or inspection and testing at the expense of the supplier, or both, to prove compliance. Products exceeding minimum requirements established by reference standards will be accepted for the Work if such products are compatible with and harmless to Work with which they are incorporated.

3. Substitution Of Products During Progress Of Work

- 3.1.** Products substituted for those specified or approved, or both, shall be permitted only if the listed product cannot be delivered to maintain construction schedule and if the delay is caused by conditions beyond the Contractor's control.
- 3.2.** Obtain approval for substitutions. Application for approval of substitutions shall be made only by Contractor. Process proposals for substituted Work in accordance with procedures established for changes in the Work.
- 3.3.** Submit, with request for substitution, documentary evidence that substituted products are equal to, or superior to, approved products, and a comparison of price and delivery factors for both specified or approved products, and proposed substitute.
- 3.4.** Ensure that substituted products can be both physically and dimensionally incorporated in the Work with no loss of intended function, performance, space or construction time, and that spare parts and service are readily available. The Contractor shall be responsible for additional installation costs, including architectural and engineering fees, required by incorporation of substituted products, and for adaptations made otherwise necessary to ensure that above requirements are satisfied.

4. Product Handling

- 4.1.** Manufacture, pack, ship, deliver and store products so that no damage occurs to structural qualities and finish appearance, nor in any other way detrimental to their function or appearance, or both.
- 4.2.** Ensure that products, while transported, stored or installed, are not exposed to an environment which would increase their moisture content beyond the maximum specified.
- 4.3.** Schedule early delivery of products to enable Work to be executed without delay. Before delivery, arrange for receiving at site.
- 4.4.** Deliver package products, and store until use, in original unopened wrapping or containers, with manufacturer's seals and labels intact.
- 4.5.** Label packaged products to describe contents, quantity and other information as specified.
- 4.6.** Product handling requirements may be repeated and additional requirements specified, in other Sections.

5. Storage & Protection

- 5.1.** Coordinate material delivery to ensure that areas within or on building are available to receive them.
- 5.2.** Store manufactured products in accordance with manufacturer's instructions, when such instructions are attached to products or submitted by him.
- 5.3.** Store finished products and woodwork under cover at all times.
- 5.4.** Store and handle flammable liquids and other hazardous materials in approved safety containers and as otherwise prescribed by safety authorities. Store no flammable liquids or other hazardous materials in bulk within the Project.
- 5.5.** Storage and special protection requirements may be repeated, and additional requirements specified, in other Sections.

6. Defective Products & Work

- 6.1.** Products and Work found defective; not in accordance with the Specifications; or defaced or injured through negligence of the Contractor, his employees or subcontractors, or by fire, weather or any other cause will be rejected for incorporation in the Work.
- 6.2.** Remove rejected products and Work from the premises immediately.
- 6.3.** Replace rejected products and Work with no delay after rejection. Provide replacement products and execute replacement Work precisely as required by the Specification for the defective Work replaced. Previous inspection and payment shall not relieve the Contractor from the obligation of providing sound and satisfactory Work in compliance with this Project Manual.

7. Workers, Suppliers & Subcontractors

- 7.1.** Assign Work only to workers, suppliers, and Subcontractors who have complete knowledge, not only of the conditions of this Project Manual, but of jurisdictional requirements, and reference standards and specifications.
- 7.2.** Give preference to use of local workers, suppliers, and Subcontractors wherever possible.

Workmanship

- 7.3.** Unless otherwise specified in a more detailed manner, workmanship shall be of the highest quality recognized by trade executing the Work in accordance with standard practices, by the best methods recommended by the manufacturer of the Product, and as approved by the Architect.

END OF SECTION 01 61 00

SECTION 01 77 00 – CONTRACT CLOSEOUT

1. Section Includes

- 1.1.** Final cleaning.
- 1.2.** Spare parts and maintenance materials.
- 1.3.** Take over procedures.

2. Related Sections

- 2.1.** Individual Specifications Sections: Specific requirements for operation and maintenance data.

3. Final Cleaning

- 3.1.** Refer to the General Conditions of Contract.
- 3.2.** Before final inspection, replace glass and mirrors broken, damaged and etched during construction, or which are otherwise defective.
- 3.3.** In addition to requirements for cleaning-up specified in General Conditions of the Contract, include in Work final cleaning by skilled cleaning specialists on completion of construction.
- 3.4.** Remove temporary protections and make good defects before commencement of final cleaning.
- 3.5.** Remove waste products and debris other than that caused by the Owner, other contractors or their employees, and leave the Work clean and suitable for occupancy by Owner.
- 3.6.** Remove surplus products, tools, construction machinery and equipment. Remove waste products and debris other than that caused by the Owner or other Contractors.
- 3.7.** Clean and polish glass, mirrors, hardware, wall tile, stainless steel, chrome, porcelain enamel, baked enamel, plastic laminate, mechanical and electrical fixtures. Replace broken, scratched or disfigured glass.
- 3.8.** Remove stains, spots, marks and dirt from decorative work, electrical and mechanical fixtures, furniture fitments, walls, and floors and ceilings.
- 3.9.** Vacuum clean and dust building interiors, behind grilles, louvres and screens as affected by Work.
- 3.10.** Wax, seal, shampoo, buff or prepare floor finishes, as recommended by the manufacturer. Use products compatible with products used by building maintenance staff.
- 3.11.** Broom clean and wash all horizontal and vertical surfaces as affected by Work.
- 3.12.** Clean up and make good exterior grades, lawns, planting and surfaces after removal of temporary access and facilities.
- 3.13.** Removing of visible labels left on materials, components, and equipment.
- 3.14.** Maintain cleaning until Owner has taken possession of building or portions thereof.

4. Spare Parts And Maintenance Materials

- 4.1.** Spare parts and maintenance materials provided shall be new, not damaged or defective, and of the same quality and manufacture as Products provided in the Work. If requested, furnish evidence as to type, source and quality of Products provided.
- 4.2.** Defective Products will be rejected, regardless of previous inspections. Replace products at own expense.
- 4.3.** Store spare parts and maintenance materials in a manner to prevent damage, or deterioration.
- 4.4.** Provide spare parts, special tools, maintenance and extra materials in quantities specified in individual specification Sections.
- 4.5.** Provide items of same manufacture and quality as items in the Work.

5. Demonstration Of Systems & Equipment

- 5.1.** Give a complete demonstration of all systems and equipment in the presence of the Consultant at the following times:
- 5.2.** When each is 100% completed at the request of the Contractor.
- 5.3.** At time of inspection to validate final completion.
- 5.4.** At final completion for the benefit of the maintenance staff for the Project.
- 5.5.** Responsible personnel representing the Subcontractor responsible for the Work being demonstrated shall be present at each demonstration.

6. Submittals

- 6.1.** Submit with application for substantial performance certificate.
 - 6.1.1.** Certificate of Substantial Performance inspection report from electrical utility or inspection.
 - 6.1.2.** Certificate of verification of fire alarm system.
 - 6.1.3.** Certificate from the Fire Marshal's Office and I.A.O. of final inspection of sprinkler system.
 - 6.1.4.** Air balance reports.
 - 6.1.5.** Other reports required or specified.
 - 6.1.6.** Maintenance Manuals and Operating Instructions.
- 6.2.** Submit with application for release of final payment:
 - 6.2.1.** Final project record drawings.
 - 6.2.2.** Extra stock.
 - 6.2.3.** Performance bonds which shall remain in effect for one (1) year after take-over date.
 - 6.2.4.** Completed Liability Insurance Policy extended for one (1) year from take-over date.
 - 6.2.5.** Written guarantee covering all workmanship and materials used in the Work.
 - 6.2.6.** Maintenance bonds as specified.

- 6.2.7.** Extended Warranties as specified
- 6.2.8.** Certificate from Workers' Compensation Board.
- 6.2.9.** Certificate from Health Services Tax Division.

7. Final Inspection Procedures

- 7.1.** Schedule, make arrangements for and administer final inspections and close out in the following stages.
- 7.2.** Contractor's Inspection:
 - 7.2.1.** Determination that Project meets requirements for substantial performance and inspection is the responsibility of the Contractor.
 - 7.2.2.** The Contractor and all Subcontractors shall conduct an inspection of the work, identify deficiencies and defects; repair as required. Notify the Consultant in writing of satisfactory completion of the contractor's Inspection and that corrections have been made. Request a Consultant's Substantial Performance Inspection.
- 7.3.** Consultant's Inspection: Consultants and the Contractor will perform an inspection of the Work to identify obvious defects or deficiencies. The contractor shall correct Work accordingly.
- 7.4.** Substantial Performance Inspection:
 - 7.4.1.** When the items noted above are complete, request a substantial performance inspection of the Work by the Consultant, and the Contractor. If Work is deemed incomplete by the Consultant, complete the outstanding items and request a re-inspection.
 - 7.4.2.** Substantial performance inspections shall be scheduled to begin within eight working days of the Contractor's request.
 - 7.4.3.** Present at the substantial performance inspection will be:
 - 7.4.3.1.** The Consultant and his Sub-consultants that he requires and notifies.
 - 7.4.3.2.** The Owner's representatives, upon notification by the Consultant.
 - 7.4.3.3.** The Contractor and such Subcontractors that he considers are required.
 - 7.4.3.4.** The Contractor will compile a substantial performance deficiency list at this inspection and issue it to the Consultant and Owner.
 - 7.4.3.5.** The Contractor shall correct substantial performance deficiencies before a date agreed upon by the Contractor and Consultant.
 - 7.4.3.6.** Upon the Consultant's approval of substantial performance, the Contractor shall submit an application for a substantial performance certificate.
 - 7.4.3.7.** When the Contractor has satisfied himself that these corrections have been completed in a satisfactory manner by his inspection he shall schedule a final Contractor's inspection by the Consultant, and the Owner's representatives if required, within five working days of the Contractor's request.

7.4.3.8. Upon the Consultant's approval of completion, the Contractor shall submit an application for a completion certificate.

8. Substantial Performance

- 8.1.** The Consultant will issue a Certificate of Substantial Performance when satisfied outstanding deficiencies noted during inspections prior to the Substantial Performance inspection have been corrected, the Work is substantially complete and is so certified by the Owner.
- 8.2.** A list of remaining deficiencies to be rectified before final acceptance will be attached to the Certificate of Substantial Performance.
- 8.3.** Make submissions specified in Subparagraph 1.06 of this Section.

9. Certificate For Release Of Amount Due At Substantial performance

- 9.1.** The Consultant will issue to the Owner a certificate for release of money in an amount equal to the amount due the Contractor under the Contract Documents provided the Consultant is satisfied the Work has been substantially completed.
- 9.2.** The certificate shall indicate the date of substantial performance.
- 9.3.** Payment shall be due in accordance with GC 5.4 and the Contract Documents.

10. Completion Certificate

- 10.1.** The Consultant will issue a Certificate of Completion (DSS Document DC670-92) when he is satisfied that outstanding deficiencies noted during inspections have been corrected and the Work is completed and is so certified by the Owner.
- 10.2.** The date of the completion certificate will commence the required sixty (60) day period before release of final payment.

11. Certificate For Release Of Final Payment

- 11.1.** Subject to the provisions of the Contract Documents, the Consultant will issue to the Owner a certificate for release of final payment sixty (60) days after date of completion certificate providing he is satisfied the Work has been completed.
- 11.2.** The certificate will be in an amount equal to the remaining money due the Contractor under the Contract, and shall indicate the date of final completion.
- 11.3.** Payment shall be due upon date of final completion.

12. Warranties

12.1. Establishment of Warranties:

12.1.1. Warranties shall commence on the Ready-for-Takeover date.

12.2. Warranty Period:

12.2.1. The Owner will advise the Consultant of defects observed during warranty periods.

12.2.2. The Consultant will notify the Contractor of defects observed during warranty period and request him to remedy the defects in accordance with the Contractor documents.

12.2.3. Thirty (30) days before expiration of warranties the Owner's representatives, the Consultant and the Contractor will inspect the Work as arranged by the Contractor noting defects of products and workmanship.

12.2.4. The Contractor shall immediately remedy such noted defects.

END OF SECTION 01 77 00

CONTRACTOR'S CHECKLIST

Pre-Closing Reminder to Proponents:

- This Request for Proposals (RFP) is a **two-file process**.
Please ensure that the submission instructions are followed carefully as noted in Section 00 21 13 – Information to Proponents to ensure your submission is compliant.
- Required Bid Security – (10% of the Contract price before HST)
- Please include a copy of your bid security in with your Price Submission file.
- Please submit your proposal to the submission email address: hrcetenders@hrce.ca
- The HRCE will use the CCDC-2, 2020 for this work. A copy of the Standard Construction Contract CCDC 2 – 2020 is available upon request and will form part of the contract documents.
- The HRCE Supplementary General Conditions for the CCDC-2, 2020 applicable for this work is available for review under Section 0073 00 of the RFP document.

Post Award Document Requirements:

- Certificate of Recognition from a safety audit organization, jointly signed with the WCB.
- Workers' Compensation Board Letter of Good Standing.
- Certificate of Good Standing from the Canadian Roofing Contractors Association and Roofing Contractors Association of Nova Scotia.
- Contract Security documentation – if required
- Insurance Certificate – As identified in the RFP.
- Schedule of Values
- Site Specific Safety Plan
- Hazard Assessment
- Listing of subcontractors
- Warranty information

The award letter will list the specific documents required and provide a submission timeframe.

A purchase order will be issued only after receipt of all required items.

Work is not authorized until purchase order is issued.

PROJECT EXPERIENCE AND REFERENCES FORM

Refer Technical Submission Requirements in Section 11.3.1 Section I.

Project #1 – The most recent HRCE project, if applicable.

Company Name	
Brief Project Description	
Project Manager Name	
Project Dollar Value \$	
Reference Name and Position Title	
Reference Contact Info - Email Address - Phone Number	

PROJECT EXPERIENCE AND REFERENCES FORM

Refer Technical Submission Requirements in Section 11.3.1 Section I.

Project #2 – The next most recent HRCE project, if applicable

Company Name	
Brief Project Description	
Project Manager Name	
Project Dollar Value \$	
Reference Name and Position Title	
Reference Contact Info - Email Address - Phone Number	

PROJECT EXPERIENCE AND REFERENCES FORM

Refer Technical Submission Requirements in Section 11.3.1 Section I.

Project #3 – Any recent project

Company Name	
Brief Project Description	
Project Manager Name	
Project Dollar Value \$	
Reference Name and Position Title	
Reference Contact Info - Email Address - Phone Number	

PROJECT SAFETY PLAN OUTLINE

During the planning of each project, environmental and occupational health and safety issues will be assessed like any other key project component.

Prior to beginning a new project, tendering contractors shall examine the work area to identify potentially hazardous site-specific situations.

Once identified, these hazards should be prioritized on this Hazard Assessments/Project Safety Plan Outline and corrective *actions* noted to eliminate or control each hazard. The dates of when and names of the people who are responsible for completing the *action* should also be assigned.

Copies of the completed Safety Plan Outline shall be submitted post award, sent to the HRCE Project Manager, and made available on the job site and communicated to the workers.

Project Name: ***RFP #4278 – Exterior Envelope Renewal***

Project Location: ***Harrietsfield Elementary***

Project Start date: _____

Project End date: _____

Company Name: _____

Completed by: _____
(Contractor's project manager)

Date: _____

Copy to: _____

PLANNING:

Does the Contractor's Occupational Health and Safety Program deal with the work activities associated with this project? ☐ Yes ☐ No

Describe tasks to be undertaken:

HAZARDS ASSESSMENT:

Identify the hazards that could present themselves on this project (e.g. live electrical wires, over water, confined space, etc) and describe what steps will be taken to prevent an incident (e.g. cover up, de-energize, safe work practices, netting, etc). Prioritize from #1 as needing immediate action.

#	Hazard	Required Action	Completed by	Date
1				
2				
3				
4				
5				
6				
7				
8				
9				
10				

ENVIRONMENTAL ASSESSMENT

Identify the environmental issues that could present themselves on this project (e.g. oil spills, asbestos, etc.) and describe the action that will be taken to eliminate or reduce the risk of occurrence (e.g. mop kits, air sampling, etc.)

#	Hazard	Required Action	Completed by	Date
1				
2				
3				
4				
5				

EMERGENCY RESPONSE

In the event of an incident, pre-plan the response and write up the procedures. Identify and arrange sources of first aid, ambulance and rescue. Minimally, the following list should be completed and posted on site:

Contact	Phone #
Fire	911
Ambulance	911
Medical	911
Police	911
Poison Control	1-902-428-8161
HRCE Central Office	1-902-464-2000
NS Dept of Public Works	1-844-696-7737
NS Dept of Health & Safety	1-800-952-2687
NS Dept of Environment	1-800-565-1633

- Accidents will be reported to: _____
- Accidents will be investigated by: _____
- A backup call will be made to: _____
- HRCE Central Office Phone: 1-902-464-2000
- HRCE Emergency After Hours Phone: 1-902-442-2476

SAFETY MEETINGS

On this project, given the nature of the work and the anticipated size of the workforce, the following frequency will apply:

Site meetings	_____
Site Audits	_____
Follow up with HRCE Manager:	_____

SITE IMPLEMENTATION

- Health and Safety Rep & Safety Committee:
Establish liaison between HRCE, contractor, site administration around first aid, personal protective equipment, and other safety items as required.
- Documentation:
Applicable MSDS Safety Program
Applicable work procedures Permits
First Aid Certification

TRAINING

The following training/testing will be mandatory on site:

- 1) _____
- 2) _____
- 3) _____

Technical Specification Package
FBM Architecture Ltd.

		# of Pages
COVER PAGE	COVER PAGE	1
SECTION 02 41 19	SELECTIVE DEMO AND REMOVAL	6
SECTION 04 05 13	MASONRY MORTAR AND GROUTING	5
SECTION 04 22 00	UNIT MASONRY	7
SECTION 05 50 00	METAL FABRICATIONS	6
SECTION 06 20 00	FINISH CARPENTRY	4
SECTION 07 05 43	CLADDING SUPPORT SYSTEM	5
SECTION 07 21 13	BOARD INSULATION	6
SECTION 07 27 14	AIR AND VAPOUR BARRIERS	8
SECTION 07 46 19	STEEL SIDING	7
SECTION 07 62 00	SHEET METAL FLASHING AND TRIM	4
SECTION 07 92 00	JOINT SEALING	6
SECTION 08 11 14	METAL DOORS AND FRAMES	7
SECTION 08 44 13	GLAZED ALUMINUM FRAMED ASSEMBLIES	16
SECTION 08 80 50	GLAZING	5
SECTION 12 21 17	ROLLER SHADES	7
		100

Part 1 General

1.1 WORK INCLUDED

- .1 This section specifies the requirements for demolition and removal of existing brick veneer, windows, doors, flashings, and items as indicated in the documents.

1.2 REFERENCES

- .1 Definitions:
 - .1 Hazardous Materials: dangerous substances, dangerous goods, hazardous commodities and hazardous products, include but not limited to: poisons, corrosive agents, flammable substances, ammunition, explosives, radioactive substances, or materials that endanger human health or environment if handled improperly.
- .2 Reference Standards:
 - .1 CSA International
 - .1 CSA S350-M1980(R2003), Code of Practice for Safety in Demolition of Structures.
 - .2 Department of Justice Canada (Jus)
 - .1 Canadian Environmental Assessment Act (CEAA), 1995, c. 37.
 - .2 Canadian Environmental Protection Act (CEPA), 1999, c. 33.
 - .1 SOR/2003-2, On-Road Vehicle and Engine Emission Regulations.
 - .2 SOR/2006-268, Regulations Amending the On-Road Vehicle and Engine Emission Regulations.
 - .3 Transportation of Dangerous Goods Act (TDGA), 1992, c. 34.

1.3 ADMINISTRATIVE REQUIREMENTS

- .1 Start-up Meetings:
 - .1 Convene start-up meeting 1 week prior to beginning work of this Section and on-site activities, with contractor to:
 - .1 Verify project requirements.
 - .2 Verify existing project conditions and conditions adjacent to areas of demolition and removal work.
 - .3 Co-ordination with other construction subtrades.
 - .2 Hold project meetings per HRCE requirements.
 - .3 Ensure key personnel attend.
 - .4 Contractor will provide written notification of change to meeting schedule established upon contract award minimum 24 hours prior to scheduled meeting.
- .2 Scheduling:
 - .1 Employ necessary means to meet project time lines without compromising specified minimum rates of material diversion.
 - .1 In event of unforeseen delay notify Contractor in writing.

1.4 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Submit in accordance with Section 01 33 00 - Submittal Procedures and Section 01 74 21 - Construction/Demolition Waste Management Disposal.

1.5 QUALITY ASSURANCE

- .1 Regulatory Requirements: Ensure Work is performed in compliance with CEPA, CEAA, TDGA, and applicable Provincial/Territorial and Municipal regulations.

1.6 SITE CONDITIONS

- .1 Environmental protection:
 - .1 Ensure Work is done in accordance with Section 01 35 43 - Environmental Procedures.
 - .2 Ensure Work does not adversely affect adjacent watercourses, groundwater and wildlife, or contribute to excess air and noise pollution.
 - .3 Fires and burning of waste or materials is not permitted on site.
 - .4 Do not bury rubbish waste materials.
 - .5 Do not dispose of waste or volatile materials including but not limited to: mineral spirits, oil, petroleum based lubricants, or toxic cleaning solutions into watercourses, storm or sanitary sewers.
 - .1 Ensure proper disposal procedures are maintained throughout project.
 - .6 Do not pump water containing suspended materials into watercourses, storm or sanitary sewers, or onto adjacent properties.
 - .7 Control disposal or runoff of water containing suspended materials or other harmful substances in accordance with authorities having jurisdiction as directed by Contractor.
 - .8 Protect trees, plants and foliage on site and adjacent properties where indicated.
 - .9 Prevent extraneous materials from contaminating air beyond application area, by providing temporary enclosures during demolition work.
 - .10 Cover or wet down dry materials and waste to prevent blowing dust and debris. Control dust on all temporary roads.

1.7 EXISTING CONDITIONS

- .1 If material resembling spray or trowel applied asbestos or other designated substance listed as hazardous be encountered in course of demolition, stop work, take preventative measures, and notify HRCE immediately. Proceed only after receipt of written instructions have been received from HRCE.
 - .1 All materials removals required to facilitate the work (i.e. – caulking, finishes, trims, etc.) are to be treated as asbestos containing materials.
 - .2 Items to be demolished and removed are based on their condition, at time of examination prior to tendering.

1.8 SALVAGE

- .1 HRCE has the right to salvage any materials, furniture and fittings, equipment and devices that are called for removal in the demolition drawings. These items may include but are not limited to doors, door hardware and controls, window blinds, trims, etc.

- .2 Consult with HRCE Project Manager prior to demolition start to determine a schedule of items to salvage, and the location to store items. Items identified must be handled carefully and in a manner to maintain their as found condition on site.

Part 2 Products

2.1 NOT USED

Part 3 Execution

3.1 PREPARATION

- .1 Protection of in-place conditions:
 - .1 Work in accordance with Section 01 35 43 - Environmental Procedures
 - .2 Prevent movement, settlement or damage of adjacent structures, services, walks, paving, trees, landscaping, adjacent grades properties parts of existing building to remain.
 - .1 Provide bracing, shoring and underpinning as required.
 - .2 Repair damage caused by demolition as directed by HRCE.
 - .3 Support affected structures and, if safety of structure being demolished or adjacent structures or services appears to be endangered, take preventative measures, stop Work and immediately notify HRCE.
 - .4 Prevent debris from blocking surface drainage system, mechanical and electrical systems which must remain in operation.

3.2 PROTECTION

1. Refer to Section 01 52 00, Construction and Temporary Facilities.
2. Take precautions to guard against damage to adjacent work. Be liable for any damage or injury caused.
3. Cease operations and notify HRCE if safety or any adjacent work appears to be endangered. Do not resume operations until reviewed with Contractor.
4. Protect building systems, services and equipment that are not part of demolition and removals.
5. Provide temporary dust screens, covers, railings, supports and other protection as required.
6. Provide plywood sheets at ground level, 8 feet high, continuous around all scaffolding/staging, to prevent unwanted access. Refer to Section 01 52 00, Construction and Temporary Facilities.
7. Provide and maintain fire prevention equipment and alarms accessible during demolition and removals.

3.3 DEMOLITION

- .1 Do demolition work in accordance with Section 01 52 00 – Construction and Temporary

Facilities.

- .2 Remove contaminated or dangerous materials as defined by authorities having jurisdiction, relating to environmental protection, from site and dispose of in safe manner to minimize danger at site or during disposal.
- .3 Prior to start of Work remove contaminated or hazardous materials listed as hazardous as defined by authorities having jurisdiction from site and dispose of at designated disposal facilities in safe manner and in accordance with TDGA and other applicable requirements and Sections.
- .4 Demolish and remove existing building elements as indicated. Removed elements include, but are not limited to, the following items:
 - .1 Brick veneer, and related ties, anchors, flashings, and sealants.
 - .2 Wall mounted signage (retain on site for reinstallation).
 - .3 Masonry chimney.
 - .4 Steel lintels.
 - .5 Window frames and glazing, and related anchors, fasteners, sealants, flashing,
 - .6 Window security screens.
 - .7 Doors, frames, and related anchors, fasteners, sealants and flashings.
 - .8 Roof metal flashings.
 - .9 Downspouts.
 - .10 Wall mounted mechanical/electrical equipment and devices. Retain on site for reinstallation. Coordinate with HRCE.
 - .11 Louvers.
 - .12 Interior window sills and trims.
- .5 Trim edges of partially demolished building elements to tolerances as defined by Consultant to suit future use.
- .6 Remove existing equipment, services, and obstacles where required for refinishing or making good of existing surfaces, and replace as work progresses.
- .7 At end of each day's work, leave Work in safe and stable condition.
 - .1 Protect interiors of parts not to be demolished from exterior elements at all times.
- .8 Demolish to minimize dusting.
- .9 Contain fibrous materials to minimize release of airborne fibres while being transported within facility.
- .10 Only dispose of material specified by selected alternative disposal option.
- .11 Remove and dispose of demolished materials except where noted otherwise and in accordance with authorities having jurisdiction.
- .12 Remove materials and equipment, store, protect, and leave ready for installation by other sections of Work.

- .13 Remove materials and equipment and store in location designated by HRCE.
- .14 HRCE will clear the site of furnishings and loose materials, as well as window treatments. Dispose of minor miscellaneous furnishings and materials that may have been overlooked by the previous occupants while vacating the premises and not intended for salvage.
- .15 Remove and dispose of demolished materials to an approved disposal site, and in accordance with authorities having jurisdiction.

3.4 CLEANING

- .1 Develop Construction Waste Management Plan related to Work of this Section.
- .2 Waste Management: separate waste materials for reuse and recycling in accordance with Section 01 74 21 - Construction/Demolition Waste Management and Disposal.
 - .1 Remove recycling containers and bins from site and dispose of materials at appropriate facility.
- .3 Divert excess materials from landfill to site approved by Contractor.
- .4 Designate appropriate security resources / measures to prevent vandalism, damage and theft.
- .5 Stockpile materials designated for alternate disposal in location which facilitates removal from site and examination by potential end markets, and which does not impede disassembly, processing, or hauling procedures.
 - .1 Label stockpiles, indicating material type and quantity.
- .6 Separate from general waste stream each of following materials in neat and orderly fashion in location and as directed by Contractor for alternate disposal.
 - .1 Tracks and blinds.
 - .2 Insulation batts.
 - .3 Miscellaneous metals and structural steel.
 - .4 Aluminum.
- .7 Supply separate, clearly marked disposal bins for categories of waste material. Do not remove bins from site until inspected and approved by HRCE. Please notify HRCE prior to removal of bins from site.
- .8 Remove stockpiled material when it interferes with operations of project construction.
- .9 Remove stockpiles of like materials by alternate disposal option once collection of materials is complete.
- .10 Transport material designated for alternate disposal using approved haulers, facilities, and receiving organizations listed in Waste Reduction Workplan and in accordance with applicable regulations.
- .11 Dispose of materials not designated for alternate disposal in accordance with applicable

regulations.

- .1 Disposal facilities must be those approved of and listed in Waste Reduction Workplan.
- .2 Written authorization from Contractor is required to deviate from disposal facilities listed in Waste Reduction Workplan.

END OF SECTION

Part 1 General

1.1 RELATED REQUIREMENTS

- .1 Section 04 22 00, Unit Masonry.

1.2 REFERENCE STANDARDS

- .1 CSA Group (CSA)
 - .1 CSA A23.1/A23.2-14, Concrete Materials and Methods of Concrete Construction/Test Methods and Standard Practices for Concrete.
 - .2 CAN/CSA-A179-14, Mortar and Grout for Unit Masonry.
 - .3 CAN/CSA-A371-14, Masonry Construction for Buildings.
 - .4 CAN/CSA-A3000-13, Cementitious Materials Compendium (Consists of A3001, A3002, A3003, A3004 and A3005).
- .2 International Masonry Industry All-Weather Council (IMIAC)
 - .1 Recommended Practices and Guide Specifications for Cold Weather Masonry Construction.
- .3 South Coast Air Quality Management District (SCAQMD)
 - .1 SCAQMD Rule 1168-[05], Adhesive and Sealant Applications.

1.3 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Submit in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Product Data:
 - .1 Submit manufacturer's instructions, printed product literature and data sheets for masonry mortar and grout and include product characteristics, performance criteria, physical size, finish and limitations.
 - .2 Submit 1 copy of WHMIS SDS in accordance with Section 01 35 29 - Health and Safety Requirements 01 35 43 - Environmental Procedures. Indicate VOC's mortar, grout, parging, colour additives and admixtures. Expressed as grams per litre (g/L).
- .3 Manufacturers' Instructions: submit manufacturer's installation instructions.

1.4 QUALITY ASSURANCE

- .1 Test Reports: submit certified test reports including sand gradation tests in accordance with CAN/CSA-A179 showing compliance with specified performance characteristics and physical properties.
- .2 Certificates: submit product certificates signed by manufacturer certifying materials comply with specified performance characteristics and criteria and physical requirements.
- .3 Mock-ups:
 - .1 Construct mock-ups in accordance with Section 04 22 00, Unit Masonry.

1.5 DELIVERY, STORAGE AND HANDLING

- .1 Deliver, store and handle materials in accordance with manufacturer's written instructions.
- .2 Delivery and Acceptance Requirements: deliver materials to site in original factory packaging, labelled with manufacturer's name and address.
- .3 Storage and Handling Requirements:
 - .1 Store materials off ground and in accordance with manufacturer's recommendations in clean, dry, well-ventilated area.
 - .2 Store and protect masonry mortar and grout packages from nicks, scratches, and blemishes.
 - .3 Replace defective or damaged materials with new.
- .4 Packaging Waste Management: remove for reuse and return by manufacturer of pallets, crates, padding, and packaging materials as specified in Construction Waste Management Plan.

1.6 SITE CONDITIONS

- .1 Ambient Conditions: maintain materials and surrounding air temperature to:
 - .1 Minimum 10 degrees C prior to, during, and 48 hours after completion of masonry work.
 - .2 Maximum 32 degrees C prior to, during, and 48 hours after completion of masonry work.
- .2 Weather Requirements: CAN/CSA-A371 and the International Masonry Industry All-Weather Council (IMIAC) - Recommended Practices and Guide Specifications for Cold Weather Masonry Construction.

Part 2 Products

2.1 MATERIALS

- .1 Use same brands of materials and source of aggregate for entire project.
- .2 Cement:
 - .1 Portland Cement: to CAN/CSA-A3000, Type GU - General use hydraulic cement gray colour.
 - .1 Use low VOC products in compliance with SCAQMD Rule 1168.
- .3 Aggregate: supplied by one supplier.
- .4 Fine Aggregate: to CAN/CSA-A179, natural sand.
- .5 Water: clean and potable.
- .6 Lime: Hydrated Lime: to CAN/CSA-A179, Type S.

2.2 MORTAR MIXES

- .1 Mortar mixes specified in this section are based on proportion specifications for portland cement-lime mortars, per Table 3 of CSA A179, Type N.
 - .1 Parts by volume: 1 part cement, 1 part lime, and 6 parts aggregate.
- .2 Mortar for exterior masonry above grade:
 - .1 Non-Load Bearing: N based on proportion specifications.
- .3 Parging Mortar: type N to CAN/CSA-A179.

2.3 MORTAR MIXING

- .1 Mix mortar ingredients in accordance with CAN/CSA-A179 in quantities needed for immediate use.
- .2 Maintain sand uniformly damp immediately before mixing process.
- .3 Using anti-freeze compounds including calcium chloride or chloride based compounds is prohibited.
- .4 Adding air entraining admixture to mortar mix is prohibited.
- .5 Use a batch type mixer in accordance with CAN/CSA-A179.
- .6 Re-temper mortar only within two hours of mixing, when water is lost by evaporation.
- .7 Use mortar within 1-1/2 hours after mixing at temperatures of 25 degrees C or higher, and 2-1/2 hours at temperatures under 25 degrees C.

2.4 GROUT MIXES

- .1 Grout: Minimum compressive strength of 10 MPa at 28 days. Maximum aggregate size and grout slump: CAN/CSA-A179.

2.5 GROUT MIXING

- .1 Mix grout ingredients in quantities needed for immediate use in accordance with CAN/CSA-A179 fine grout.
- .2 Add admixtures in accordance with manufacturer's instructions; mix uniformly.
- .3 Using calcium chloride or chloride based admixtures is prohibited.

2.6 MIX TESTS

- .1 Testing Mortar Mix:
 - .1 The test will be used to provide a reference value for field prepared mortar tests.
 - .2 Test mortar in accordance with CAN/CSA-A179, for mortar-based proportion specification. Test prior to construction as part of mock-up and during construction for:
 - .1 Compressive strength.
 - .2 Consistency.
 - .3 Mortar aggregate ratio.
 - .4 Sand/cement ratio.

- .5 Water content and water/cement ratio.
- .6 Air content.

Part 3 Execution

3.1 EXAMINATION

- .1 Verification of Conditions: verify that conditions of substrate previously installed under other Sections or Contracts are acceptable for masonry installation in accordance with manufacturer's written instructions.
 - .1 Inform Consultant of unacceptable conditions immediately upon discovery.
 - .2 Proceed with installation only after unacceptable conditions have been remedied and approval to proceed from Consultant has been provided.

3.2 CONSTRUCTION

- .1 Do masonry mortar and grout work in accordance with CAN/CSA-A179 except where specified otherwise.

3.3 MIXING

- .1 Clean mixing boards and mechanical mixing machine between batches.
- .2 Mortar: weaker than units it is binding.
- .3 Contractor to appoint one individual to mix mortar, for duration of project. In event that this individual is changed, mortar mixing must cease until new individual is trained, and mortar mix is tested.

3.4 MORTAR PLACEMENT

- .1 Install mortar to manufacturer's instructions.
- .2 Install mortar and grout to requirements of CAN/CSA-A179.

3.5 GROUT PLACEMENT

- .1 Install grout in accordance with manufacturer's instructions.
- .2 Install grout in accordance with CAN/CSA-A179.
- .3 Work grout into concrete 'brick check' to eliminate voids and create a solid, uniform, level surface for installation of steel base plate at base of brick veneer walls.

3.6 FIELD QUALITY CONTROL

- .1 Test and evaluate mortar prior to construction and during construction in accordance with CAN/CSA-A179.
 - .1 Frequency of testing:
 - .1 One (1) test per elevation.

3.7 CLEANING

- .1 Per Section 04 22 00, Unit Masonry.

3.8 PROTECTION

- .1 Per Section 04 22 00, Unit Masonry.

END OF SECTION

Part 1 General

1.1 RELATED SECTIONS

- .1 Section 04 05 13, Masonry Mortar and Grouting.
- .2 Section 07 27 14, Air and Vapour Barriers
- .3 Section 07 46 19, Steel Siding
- .4 Section 07 62 00, Sheet Metal Flashing and Trim
- .5 Section 07 92 00, Joint Sealing
- .6 Section 08 44 13, Glazed Aluminum Framing Systems

1.2 REFERENCES

- .1 ASTM International (ASTM)
 - .1 ASTM A153/A153M-09, Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware.
 - .2 ASTM A580/A580M-18, Standard Specification for Stainless Steel Wire.
 - .3 ASTM A653/A653M-13, Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
 - .4 ASTM C73-10, Standard Specification for Calcium Silicate Brick (Sand-Lime Brick).
- .2 CSA International (CSA)
 - .1 CSA A23.1-14/A23.2-14, Concrete Materials and Methods of Concrete Construction/Methods of Test for Concrete, Includes Update No.1 (2011).
 - .2 CAN/CSA A82.1-M87 (R2003), Burned Clay Brick (Solid Masonry Units Made From Clay or Shale).
 - .3 CAN/CSA A179-14, Mortar and Grout for Unit Masonry.
 - .4 CSA A370-14, Connectors for Masonry.
 - .5 CSA A371-14, Masonry Construction for Buildings.
 - .6 CSA A3000-13, Cementitious Materials Compendium (Consists of A3001, A3002, A3003, A3004 and A3005), Includes Update No. 1 (2014), Update No. 2 (2014).
 - .7 CSA S304.1-04(R2010), Design of Masonry Structures.

1.3 ADMINISTRATIVE REQUIREMENTS

- .1 Coordination:
 - .1 Coordinate lines, levels and coursing with work of other Sections.
 - .2 Obtain built-in items prior to start of this work.
- .2 Pre-Installation Meetings: convene pre-installation meeting one week prior to beginning work of this Section and on-site installation, with Contractor's representative, trade contractor, material supplier and Consultant to:

- .1 Verify project requirements including specification and details for project.
- .2 Confirm required mortar, grout and concrete testing; review batch control and grouting procedures.
- .3 Co-ordination with related Work including, but not limited to, window installation, steel siding, air/vapour membranes and insulation.
- .4 Review cavity drainage requirements and methods for keeping mortar out of cavity spaces.
- .5 Coordinate crack control measures.
- .6 Review membranes and membrane flashing materials and details used for construction.
- .7 Confirm trowelled or tooled joints to concealed and exposed masonry faces.
- .8 Review methods for controlling efflorescence during construction.
- .9 Review hot and cold weather requirements.

1.4 SUBMITTALS

- .1 Provide submittals in accordance with Section 01 33 00 – Submittal Procedures.
 - .1 Provide manufacturer's printed product literature, specifications and data sheet. Indicate masonry types, shapes, sizes, and textures.
 - .2 Cementitious Materials:
 - .1 Include brand, type, and name of manufacturer for site mixed mortar materials.
 - .2 Submit proposed mix proportions and sand analysis reports and compressive strength reports on the proposed mortar mix(es).
- .2 Submit samples in accordance with Section 01 33 00 – Submittals Procedures.
 - .1 Provide one clay brick unit to show texture and colour variance of finish.
 - .2 Obtain review comments from Consultant prior to ordering.

1.5 QUALITY ASSURANCE

- .1 Sole Source: Obtain brick masonry from a single manufacturer for entire project. Conform to CSA A371, except as modified by this specification.
- .2 The masonry contractor shall be a member in good standing of the Canadian Masonry Contractors' Association (CMCA) through a registered Chapter.
- .3 The masonry contractor shall have a minimum of 10 years of experience on projects of similar size and magnitude and shall provide continuous active supervision by a journeyman mason while masonry work is in progress.
- .4 Test laboratory prepared samples of the proposed mortar(s) for compressive strength in accordance with CAN/CSA A179, per Section 04 05 13, Masonry Mortar and Grouting.
- .5 Connectors and joint reinforcement shall conform to CSA A370.
- .6 Miscellaneous masonry accessories and their use where not otherwise specified but shown or required for proper completion of the Work, shall conform to CSA A371.

1.6 MOCK-UPS

- .1 Construct mock-up in accordance with Section 01 45 00 – Quality Control.
- .2 Construct one mock-up panel of unit masonry construction at window head, complete with metal flashing. Construct mock-up to establish a standard of construction, workmanship, and appearance.
- .3 Do not continue with work of this Section until Consultant has reviewed mock-up.
- .4 Accepted mock-up may form part of Work.

1.7 DELIVERY, STORAGE, AND HANDLING

- .1 Deliver masonry units on pallets or cubes, suitably protected from road grime and moisture absorption due to exposure to rain or melting snow.
- .2 Unload and store on dry, level areas.
- .3 Deliver cement, lime, and mortar in dry condition with manufacturer's label intact and store under waterproof cover and protected from elements.

1.8 WASTE MANAGEMENT AND DISPOSAL

- .1 Separate and divert waste materials from landfill in accordance with Section 01 74 21 – Construction Waste Management.

1.9 SITE CONDITIONS

- .1 Ambient Conditions: maintain materials and surrounding air temperature to:
 - .1 Minimum 10 degrees C prior to, during, and 48 hours after completion of masonry work.
 - .2 Maximum 32 degrees C prior to, during, and 48 hours after completion of masonry work.

1.10 WARRANTY

- .1 Contractor agrees to correct any deficiencies of labour or material found in the work performed for a period of 5 years from the date of Substantial Performance.

Part 2 Products

2.1 BRICK MASONRY UNITS

- .1 Face brick, to CSA A82.1: by Shaw Brick, physical properties and performance criteria, as follows:
 - .1 ASTM C216, Type S metric modular.
 - .2 Compressive strength (Gross Area), to CSA A82.1: 70 - 90 MPa.
 - .3 Absorption (24 hr. cold water), to CSA A82.1: 2 - 4%.
 - .4 Maximum Saturation Coefficient, to CSA A82.1: 0.50 – 0.70.
 - .5 Freeze-Thaw test results after 50 cycles, to CSA A82.1: not to exceed 0.5% dry mass weight loss.
 - .6 Initial Rate of Absorption (IRA) maximum, to CSA A82.1: 5g/min/20,000 mm².
 - .7 Acceptable material: to match existing brick.

2.2 MORTAR AND GROUT MATERIALS

- .1 Per Section 04 05 13, Masonry Mortar and Grouting.

2.3 TIES AND ANCHORS

- .1 To CSA A370 and CSA S304.
- .2 At exterior brick masonry veneer to concrete block back-up walls:
 - .1 Masonry veneer connector assembly to be comprised of tie and plate components, as specified.
 - .2 Plate (at steel stud back-up wall): 1.5mm (16 gauge), 2" wide flat plate with two holes for screw connection to substrate material. Slotted connection for ties. Length of plate to suit existing insulation/cavity thickness.
 - .1 Hot dipped galvanized to ASTM A153/A153M.
 - .3 Tie: 4.76mm diameter wire.
 - .1 Stainless steel to ASTM A580 / A580M.
 - .4 Fasteners, as recommended by manufacturer, Type 316 stainless steel.
 - .5 Standard of Acceptance:
 - .1 BL-407, by Blok-Lok.
 - .6 Accessories:
 - .1 Insulation support/retainer: Polyethylene. Friction fit onto plate to hold insulation snug against sheathing/air barrier.
 - .1 Standard of acceptance:
 - .1 Wedge-Lok, by Blok-Lok.

2.4 FLASHING

- .1 Air/Vapour Barrier Through-wall Flashing Membrane: per Section 07 27 14.
- .2 Sheet metal flashing: per Section 07 62 00.

2.5 ACCESSORIES

- .1 Sealants and joint fillers: per Section 07 92 00.
- .2 Bond Breaker Strips: #15 asphalt saturated, organic roofing felt in accordance with CSA A123.3.
- .3 Cavity Drainage Material: Pre-manufactured cavity insert, sized for width of cavity designed to offset or stagger the accumulation of mortar droppings to reduce risk of clogging vents or weeps:
 - .1 Acceptable Materials:
 - .1 Mortar Net USA, Mortar Net.
 - .2 Blok-Lok, Mor-Control.
- .4 Air Circulation and Weep Vents (insect and rodent proof):
 - .1 Acceptable Materials:
 - .1 CavClear® Weep Vents, by Archovations, Inc..

- .2 TERM Weep and Vent Barrier, by Polyguard Products, Inc.
- .3 QV - Quadro-Vent, by Hohmann & Barnard, Inc.
- .4 CellVent, by Mortar Net Solutions.
- .5 CellVent, by Blok-Lok.
- .5 Cavity Wall Insulation: per Section 07 21 13.

2.6 CLEANING COMPOUNDS

- .1 Use low VOC products in compliance with SCAQMD Rule 1168.
- .2 Compatible with substrate and acceptable to masonry manufacturer for use on products.

Part 3 Execution

3.1 MANUFACTURER'S INSTRUCTIONS

- .1 Compliance: comply with manufacturer's printed installation instructions, data sheets, and standard details.

3.2 REMOVALS

- .1 Per Section 02 41 19.

3.3 EXAMINATION

- .1 Verify surfaces and conditions are ready to accept work of this Section.
- .2 Examine work of other Sections upon which work of this section is dependent. Should discrepancies be found which affect the proper performance of the work of this section, do not commence work until such discrepancies have been resolved.

3.4 PREPARATION

- .1 Protect adjacent finished materials from damage due to masonry work.

3.5 INSTALLATION – GENERAL

- .1 Work shall conform to CAN/CSA A371.
- .2 Where mortar has started to harden at units requiring repositioning, remove and replace with fresh mortar.
- .3 Masonry horizontal and vertical joints to be 10 mm thick except where adjustments are necessary to maintain the bond pattern or to adjust coursing.
- .4 Air/Vapour barrier membrane and cavity insulation: per Sections 07 27 14 and 07 21 13.

3.6 BRICK MASONRY

- .1 Construct cavity walls using techniques that will minimize mortar dropping in cavity space. No mortar shall bridge cavity space or plug cavity vents at bottom of cavity.
- .2 Mixing and blending: mix units within each pallet and with other pallets to ensure uniform blend of colour and texture.
- .3 Bond: to match existing.
- .4 Jointing: concave.

- .5 Mixing and blending: mix units within each pallet and with other pallets to ensure uniform blend of colour and texture.
- .6 Clean clay masonry as work progresses.
- .7 Tolerances: to CAN/CSA A371.

3.7 BONDING AND TYING

- .1 Tie masonry veneer to backing in accordance with National Building Code, CSA S304.1, CSA A371 and as indicated.

3.8 FLASHING

- .1 Build in flashing in masonry in accordance with CSA A371.
- .2 Install metal through-wall flashings, as indicated.
- .3 Install membrane flashing over metal flashing, as indicated.

3.9 CELL VENTS FOR DRAINAGE AND AIR CIRCULATION

- .1 Install weep vents in head joints in exterior wythes of first course of masonry immediately above embedded flashing and as follows:
 - .1 Use pre-manufactured inserts to form weep vents, spaced at 400mm on center.

3.10 ACCESSORIES

- .1 Install sealants: to Section 07 92 00, at joints and penetrations to ensure continuity of weatherproofing.
- .2 Install cavity drainage material to maintain cavity free of obstructions in order to accommodate free drainage through weep holes.
- .3 Install cavity wall insulation: Install insulation where indicated. Secure to substrate with adhesive backed stick pins complete with retaining washer.
- .4 Install other accessories as required for a complete installation of wall assemblies.

3.11 REPAIR/RESTORATION

- .1 Upon completion of masonry, fill holes and cracks, remove loose mortar and repair defective work.

3.12 FIELD QUALITY CONTROL

- .1 Period site reviews of work of this section by Architect.
- .2 Testing: per Section 04 05 13, Masonry Mortar and Grouting.

3.13 CLEANING

- .1 Clean in accordance with Section 01 74 11 - Cleaning.
- .2 Brick Masonry:
 - .1 Perform cleaning as soon as possible after installation to remove construction and accumulated environmental dirt.
 - .2 Clean clay masonry: 10 m² area of wall designated by Consultant and leave for one week. If no harmful effects appear and after mortar has set and cured, protect windows, sills, doors, trim and other work, and clean brick masonry as follows:

ISSUED FOR TENDER

- .1 Remove large particles with wood paddles without damaging surface. Saturate masonry with clean water and flush off loose mortar and dirt.
 - .2 Scrub with solution of 25 mL trisodium phosphate and 25 mL household detergent dissolved in 1 L of clean water using stiff fibre brushes, then clean off immediately with clean water using hose. Alternatively, use proprietary compound recommended by brick masonry manufacturer in accordance with manufacturer's directions.
 - .3 Repeat cleaning process as often as necessary to remove mortar and other stains.
 - .4 Use acid solution treatment for difficult to clean masonry as described in Technical Note No. 20 by the Brick Industry Association.
- .3 Upon completion of installation, remove surplus materials, rubbish, tools, and equipment barriers.

END OF SECTION

PART 1 GENERAL

1.1 REFERENCES

- .1 ASTM International (ASTM)
 - .1 ASTM A123/A123M-12, Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products.
 - .2 ASTM B209, Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate 1
 - .3 ASTM A307-10, Standard Specification for Carbon Steel Bolts and Studs, 60,000 PSI Tensile Strength.
 - .4 ASTM A780/A780M-09, Standard Practice for Repair of Damaged and Uncoated Areas of Hot-Dip Galvanized Coatings.
 - .5 ASTM F593-13, Standard Specification for Stainless Steel Bolts, Hex Cap Screws, and Studs.
 - .6 ASTM F1267-18, Standard Specification for Metal, Expanded, Steel.
- .2 CSA International (CSA)
 - .1 CAN/CSA G40.20/G40.21-04 (R2009), General Requirements for Rolled or Welded Structural Quality Steel/Structural Quality Steel.
 - .2 CAN/CSA G164-[M92(R2003)], Hot Dip Galvanizing of Irregularly Shaped Articles.
 - .3 CSA S16-09, Design of steel structures, Includes Update No. 1 (2010), Update No. 2 (2010), Update No. 3 (2013).
 - .4 CSA W47.1-09, Certification of companies for fusion welding of steel, Includes Update No. 3 (2011), Update No. 5 (2012).
 - .5 CSA W59-13, Welded Steel Construction (Metal Arc Welding).
 - .6 CSA W178.2-08 (R2013), Certification of Welding Inspectors.

1.2 SUBMITTALS

- .1 Submit manufacturer's printed product literature, specifications and data sheets.
- .2 Submit Shop Drawings as follows:
 - .1 Indicate materials, profiles, core thicknesses, finishes, connections and joints, method of anchorage, number of anchors, supports, reinforcement, details, and accessories.

1.3 QUALITY ASSURANCE

- .1 Test Reports: Certified test reports showing compliance with specified performance characteristics and physical properties.
- .2 Certificates: Product certificates signed by manufacturer certifying materials comply with specified performance characteristics and criteria and physical requirements.

- .3 Perform Work to the highest standard of modern shop and field practice, by personnel experienced in this Work. Accurately fit joints and intersecting members in true planes with adequate fastening. Build and erect the Work plumb, true, square, straight, level, accurate to the sizes shown, and free from distortion or defects.
- .4 Fabricator Qualifications: A firm experienced in producing metal fabrications similar to those indicated for this Project and with a record of successful in-service performance, as well as sufficient production capacity to produce required units.
- .5 Welding: Qualify procedures and personnel according to the following:
 - .1 Welders shall be qualified by Canadian Welding Bureau for classification of work being performed.
 - .2 The fabricator shall be certified to CSA W47.1, Division 1 or 2.1.
 - .3 Do welding inspection to CSA W178.
 - .4 Fusion welding: to CSA W59.

1.4 DELIVERY, STORAGE, AND HANDLING

- .1 Exercise due care in storing, handling and erecting all materials and support all materials properly at all times so that no piece will be bent, twisted or otherwise damage structurally or visibly.
- .2 Correct damaged material and where the Consultant deems damage irreparable, replace the affected items at no additional expense to the Consultant or Owner.
- .3 Apply protective covering to face of all exposed finished metalwork before it leaves shop, covering to remain until item installed.

1.5 JOB CONDITIONS

- .1 Coordinate this Work with the remainder of the Work and exercise the necessary scheduling to ensure that all Work is carried out and all items incorporated during the appropriate construction phase.
- .2 Provide instructions and drawings to other trades for anchors bolts, and other members that are built in to work of other trades.
- .3 Protect other Sections of the Work from damage by this Section of the Work.

PART 2 PRODUCTS

2.1 MATERIALS

- .1 Steel angles and plates: to CAN/CSA G40.20/G40.21, Grade 300W.
- .2 Aluminum plates and sheets: to ASTM B209.
- .3 Welding materials: to CSA W59.
- .4 Welding electrodes: to CSA W48 Series.
- .5 Expanded metal: to ASTM F1267.

2.2 FABRICATION

- .1 Fabricate to NBC 2020 criteria.
- .2 Form metal fabrications from materials of size, thickness, and shapes indicated but not less than that needed to comply with performance requirements indicated. Work to dimensions indicated or accepted on shop drawings, using proven details of fabrication and support. Use type of materials indicated or specified for various components of each metal fabrication.
- .3 Fabricate work square, true, straight and accurate to required size, with joints closely fitted and properly secured.
- .4 Ease exposed edges to a radius of approximately 0.794 mm (1/32 inch), unless otherwise indicated. Form bent-metal corners to smallest radius possible without causing grain separation or otherwise impairing work.
- .5 Welding:
 - .1 Weld seams continuously to comply with American Welding Society (AWS) recommendations, and the following:
 - .2 Use materials and methods that minimize distortion and develop strength and corrosion resistance of base metals.
 - .3 Ensure exposed welds are continuous for length of each joint.
 - .4 Grind or file exposed welds and steel sections smooth and flush with adjacent surfaces.
 - .5 Obtain fusion without undercut or overlap.
 - .6 Remove welding flux immediately.
 - .7 Finish exposed welds and surfaces smooth and blended so that no roughness shows after finishing and contour of welded surface matches those adjacent.
 - .8 All welding is to be performed by CWB Certified Welders.
- .6 Use exposed fasteners of type indicated or, if not indicated, Phillips flat-head (countersunk) screws or bolts. Locate joints where least conspicuous.
- .7 Provide for anchorage of type indicated; coordinate with supporting structure. Fabricate and space anchoring devices to provide adequate support for intended use.
- .8 Cut, reinforce, drill and tap miscellaneous metalwork as indicated to receive finish hardware, screws, and similar items.
- .9 Fabricate joints that will be exposed to weather in a manner to exclude water, or provide weep holes where water may accumulate.

2.3 LINTELS AND PLATES

- .1 Galvanized steel loose lintels, to CSA G40.20/G40.21.
 - .1 Size: 100mm x 100mm x 10mm thick.
 - .2 Length: to suit window and door opening widths, plus 200mm for bearing at each side of opening.

- .2 Galvanized steel plate, to CSA G40.20/G40.21.
 - .1 Size: 200mm wide x 10mm thick.
 - .2 Length: longest length practical.
 - .3 For use at base of brick veneer walls.
 - .4 Accessory: Non-shrink grout, per Section 04 05 13, Masonry Mortar and Grouting, to create level surface for steel plates.

2.4 WINDOW SECURITY SCREEN

- .1 Girt, bracket, and frame components:
 - .1 5mm (3/16") thick aluminum plates welded to create profiles indicated.
- .2 Expanded metal screen:
 - .1 Aluminum (Alloy:1100), flattened expanded mesh.
 - .2 Pattern: Diamond.
 - .1 Diamond openings size: 0.687" (SWO) x 1.75" (LWO).
 - .2 Strand size: 0.143" wide x 0.07" thick.
 - .3 Thickness: 0.07".
 - .4 Diamonds per foot (approx.): 13 (SWD), 6 (LWD).
 - .5 Opening area (%): 70.

2.5 SILL PAN AND BASE FLASHING

- .1 5mm (3/16") thick aluminum plates welded to create profiles indicated.
 - .1 For use at base of metal cladding and Gym doors.

2.6 FASTENERS

- .1 Bolts, nuts, and washers: to ASTM A307, Grade A, to be hot dip galvanized in accordance with ASTM A153/A153M or CAN/CSA G164. Supply bolts of lengths required to suit the thickness of the material being joined, and to provide 75mm minimum embedment into existing masonry or concrete.
 - .1 For use at steel plates at base of wall/top of foundation walls (base of brick veneer) and aluminum bracket to aluminum girt connections supporting window security screens.
 - .2 Diameter:
 - .1 16mm at steel base plates.
 - .2 6mm at girt to bracket connections.
- .3 Screw anchors: Steel screws designed for anchoring to concrete and masonry substrates, 6mm diameter, flat head, with 50mm minimum embedment.
 - .1 Genuine Tapcon, by ITW, or approved alternate.
 - .1 For use at aluminum girts supporting window security screen brackets.

- .2 Pin bolts: light duty pin bolt anchor assembly comprised of corrosion resistant zinc/aluminum alloy anchor body with stainless steel pin; length to provide 38mm minimum embedment into existing masonry, 6mm (1/4") diameter.
 - .1 Standard of acceptance: Zamac Pin Bolt, by UCAN.
 - .2 For use at aluminum base flashing (base of metal cladding).
- .3 Provide all bolts or other means of anchorage required for securing fabricated metal components to existing masonry and concrete substrates. Fasten all components and items securely. Provide adequate reinforcing to ensure safe rigid installation. Set anchor bolts as required for properly securing Work, as indicated in reviewed submittals.
- .4 Use epoxy set threaded rods/bolts or self-drilling expansion type concrete anchors for attaching to masonry and concrete.

2.7 FINISHES

- .1 Aluminum: mill finish.
 - .1 Items: base flashing at metal cladding walls, sill pans at Gym doors, and window security screen components.
- .2 Galvanizing: hot-dip method with minimum zinc coating of 705 g/m2 conforming to ASTM A123 for steel lintels. Hot dip galvanize after fabrication.
 - .1 Touch-up galvanized surfaces with zinc rich coating, to ASTM A780: DOD-P-21035 zinc rich paint, minimum DFT 8 mils.
- .3 Fasteners (exposed screws and anchors): stainless steel
- .4 Isolation Coating: Apply an isolation coating to contact surfaces in contact with cementitious materials, wood materials and dissimilar metals.

PART 3 EXECUTION

3.1 EXAMINATION

- .1 Verification of Conditions: verify that conditions are acceptable for product installation in accordance with manufacturer's written instructions.
 - .1 Check and verify that no irregularities exist that would affect quality of execution of work specified.
 - .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 Erect to NBC 2020 and amendments, CSA S16, and Code of Standard Practice for Structural Steel.
- .2 Install Work in accordance with manufacturer's or fabricator's (as applicable) written instructions, job-specific details, and Drawings.
- .3 Install all Work to true, straight lines, accurate to profile, all properly aligned.
- .4 Isolate dissimilar metals in a manner approved by the Consultant to prevent electrolytic action or corrosion.

3.3 CLEANING

- .1 Progress Cleaning: clean in accordance with Section 01 74 11 - Cleaning. 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. Perform cleaning after installation to remove construction and accumulated environmental dirt.
- .3 Manage and dispose of demolition and construction waste materials in accordance with Section 01 74 21 - Construction Waste Management.

3.4 PROTECTION

- .1 Protect installed products and components from damage during construction.
- .2 Repair damage to adjacent materials caused by Work of this Section.

3.5 SCHEDULE

- .1 The schedule given hereunder shall not be considered to represent a complete schedule of all metal fabrications required in the Work. Thorough scrutiny of the complete Contract Documents is required to obtain a complete schedule of metal fabrications required in the Work.
- .2 Provide the following metal fabrications:
 - .1 Lintels: at all window and door openings in brick veneer.
 - .2 Base flashing: at base of metal cladding walls.
 - .3 Base plate: at base of brick veneer walls.
 - .4 Sill pan: at Gym door thresholds.
 - .5 Security screen: ground floor windows (as indicated on exterior elevations).

END OF SECTION

Part 1 General

1.1 RELATED SECTIONS

- .1 Section 07 92 00 – Joint Sealing.

1.2 REFERENCES

- .1 American National Standards Institute (ANSI)
 - .1 ANSI/ASME 18.6.1 (R2012) Wood Screws (Inch Series).
- .1 American Society for Testing and Materials International (ASTM)
 - .1 ASTM E1333-14, Standard Test Method for Determining Formaldehyde Concentrations in Air and Emissions Rates from Wood Products Using a Large Chamber.
 - .2 ASTM F1667-17, Standard Specification for Driven Fasteners: Nails, Spikes, and Staples.
- .2 Architectural Woodwork Manufacturers Association of Canada (AWMAC)
 - .1 ARCHITECTURAL WOODWORK STANDARDS, EDITION TWO (2014) PLUS ALL ERRATA THROUGH APRIL 29, 2016.
- .3 National Hardwood Lumber Association (NHLA)
 - .1 Rules for the Measurement and Inspection of Hardwood and Cypress.
- .4 National Lumber Grades Authority (NLGA)
- .5 Standard Grading Rules for Canadian Lumber 2017.
- .6 Master Painters Institute (MPI)
 - .1 MPI Architectural Painting Specifications Manual, 2014.

1.3 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Submit in accordance with Division 01 General Requirements.
- .2 Samples.
 - .1 Submit 250 mm long sample of trim with specified coating.
 - .2 Reviewed samples shall become the standard for the work.
- .3 Closeout Submittals:
 - .1 Provide operations and maintenance data in accordance with Division 01 General Requirements.

1.4 QUALITY ASSURANCE

- .1 Perform Work of this Section by finish carpentry contractor with minimum 5 years of current experience and having completed minimum one project in the past 5 years.
- .2 Architectural Woodwork Standards (AWS) published by the Architectural Woodwork Manufacturers Association of Canada, together with authorized additions and amendments will be used as a reference standard and shall form part of this project specification. Where differences occur between the drawings and specifications requirements and the AWS, the more restrictive requirement shall prevail.

- .3 Any reference to Custom or Premium grade in this specification shall be as defined in the AWS.
- .4 Any item not given a specific quality grade shall be Premium grade as defined in the AWS.
- .5 A copy of the AWS shall be made readily available for reference purposes on the job site.
- .6 References in this specification to part and item numbers mean those parts and items contained within the AWS.
- .7 Materials and installation shall be in Metric measurements as specified.

1.5 DELIVERY, STORAGE AND HANDLING

- .1 The Architectural Woodwork Manufacturer and the Contractor shall be jointly responsible to make certain that architectural woodwork is not delivered until the building and storage areas are sufficiently dry so that the architectural woodwork will not be damaged by excessive changes in moisture content.
- .2 Architectural woodwork delivery, storage and handling shall be in accordance with Section 2 Care and Storage of the AWS.
- .3 Delivered materials which are damaged in any way or do not comply with these specifications will be rejected by the Consultant and shall be removed from the job site and replaced with acceptable materials.

1.6 PROJECT CONDITIONS

- .1 Environmental Conditions: Comply with the AWS Section 2 – Care & Storage for optimum temperature and humidity conditions for woodwork during its storage and installation. Do not install woodwork until these conditions have been attained and stabilized.

1.7 COORDINATION

- .1 Coordinate provision of concealed blocking or supports.
- .2 Ensure that back-priming of finish carpentry surfaces concealed after installation, has been performed.

Part 2 Products

2.1 MATERIALS

- .1 Hardwood trim: white maple species, S4S, average moisture content of 6% and maximum of 9% for interior work in accordance with following standards:
 - .1 AWS premium grade, moisture content as specified.
 - .2 Dimension: as indicated.
 - .3 For use at interior window trims/aprons, sills, as indicated.
- .2 Conform to latest MPI requirements for all interior painting work including preparation and priming.

2.2 FINISH

- .1 Clear polyurethane varnish (single component) finish (transparent finish).
 - .1 MPI Reference: INT 6.4J; RIN 6.4L for refinishing work.
 - .1 1st Coat: Wood Filler.
 - .2 2nd Coat: Polyurethane (reduced)
 - .3 3rd Coat: Polyurethane.
 - .4 4th Coat: Polyurethane.
 - .5 Gloss: Satin.

2.3 ACCESSORIES

- .1 Fasteners: to suit size and nature of components being fastened.
- .2 Nails and staples: to ASTM F1667; galvanized to ASTM A123/A123M for exterior work; plain finish elsewhere.
- .3 Wood screws: to ANSI/ASME 18.6.1, countersunk flush type unless indicated otherwise, in sizes to suit application, electroplated steel for other locations.
- .4 Splines: wood.
- .5 Adhesive: recommended by manufacturer.
- .6 Caulking: per Section 07 92 00 – Joint Sealing.

2.4 SITE FABRICATION

- .1 Fabricate items rigid, plumb and square, as detailed, with tight, bevelled, hairline joints. Sand work smooth, set all nails and screws.
- .2 Countersink bolts and washers, fill holes with matching wood plugs.

Part 3 Execution

3.1 EXAMINATION

- .1 Verification of Conditions: verify conditions of substrates previously installed under other Sections or Contracts are acceptable for wood products installation in accordance with AWS tolerances and requirements of Contract Documents.

3.2 PREPARATION

- .1 Back prime woodwork before installation, to AWS.

3.3 INSTALLATION

- .1 Do finish carpentry to Premium Quality Standards of the AWS, except where specified otherwise.
- .2 Install items of finish carpentry at locations shown on drawings.
 - .1 Position accurately, level, plumb straight.
 - .2 Fasten and anchor securely.
- .3 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.

- .4 Form joints to conceal shrinkage.
- .5 Conform to latest MPI requirements for all interior painting work including preparation and priming.

3.4 CONSTRUCTION

- .1 Fastening:
 - .1 Position items of finished carpentry work accurately, level, plumb, true and fasten or anchor securely.
 - .2 Design and select fasteners to suit size and nature of components being joined. Use proprietary devices as recommended by manufacturer.
 - .3 Set finishing nails to receive filler. Where screws are used to secure members, countersink screw in round smooth cut hole and plug with wood plug to match material being secured.
 - .4 Replace items of finish carpentry with damage to wood surfaces including hammer and other bruises.

3.5 CLEANING

- .1 Progress Cleaning: clean in accordance with Division 01 General Requirements. Leave Work area clean at end of each day.
- .2 Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment in accordance with Division 01 General Requirements. Perform cleaning after installation to remove construction and accumulated environmental dirt.
- .3 Manage and dispose of demolition and construction waste materials in accordance with Division 01 General Requirements.

3.6 PROTECTION

- .1 Protect installed products and components from damage during construction.
- .2 Repair damage to adjacent materials caused by Work of this Section.

3.7 SCHEDULE

- .1 Refer to Contract Drawings for construction and locations.

END OF SECTION

Part 1 General

1.1 RELATED REQUIREMENTS

- .1 Section 05 50 00 - Metal Fabrications.
- .2 Section 07 27 14 - Air and Vapour Barriers.
- .3 Section 07 46 19 - Steel Siding.

1.2 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Submittals shall meet the requirements of Section 01 33 00 – Submittal Procedures.
- .2 Product Data:
 - .1 Submit manufacturer's published product literature, specifications and datasheets for specified products.
- .3 Submit Engineered Shop Drawings:
 - .1 Coordinate with cladding trades as required to ensure full cooperation and coordination, and integration of the Work of this specification Section 07 05 43 with the work of related cladding requirements.
 - .2 Shop drawings shall be designed and bear the professional seal and signature of a professional structural engineer (P.Eng.) licenced to practice in Nova Scotia
 - .3 Indicate layout, profiles and assembly components, including connections to structure and cladding systems, accessories, flashing details, and other relevant details of construction.
 - .4 Include details showing thickness and dimensions of the various system parts, fastening and anchoring methods, locations of joints and location, and configuration of movement joints.
- .4 Quality assurance submittals:
 - .1 Manufacturer's Instructions: Submit manufacturer's installation instructions and installation sequence.
- .5 Field Review Reports: provided by Contractor's delegated design professional engineer.
- .6 Submit warranties.

1.3 QUALITY ASSURANCE

- .1 Retain a Professional Engineer, registered in Province of Nova Scotia to design fabrication and erection of the pre-formed steel cladding assembly.
- .2 Comply with Division 01 requirements.

1.4 DELIVERY, STORAGE AND HANDLING

- .1 Deliver, store and handle materials in accordance with Division 01 requirements.
- .2 Deliver, store and protect material in accordance with manufacturer's published instructions.

1.5 SITE CONDITIONS

- .1 Site Measurements: Verify dimensions by field measurements before fabrication and indicate measurements on Shop Drawings.

- .2 Establish dimensions and proceed with fabricating thermal break clips where field measurements cannot be made without delaying the work; allow for site trimming and fitting.
- .3 Ambient Conditions: Install materials outlined in this Section after completion of work by other Sections is complete, and all penetrations are airtight and watertight; to provide adequate dry, clean, level, and plumb surfaces for installation and adhesion.

1.6 COORDINATION

- .1 Coordinate work with exterior wall erection, installation of sheathing and water-resistive air and vapour control membrane, installation of insulation, installation of claddings, and installation of windows, doors, and adjacent assemblies and materials.

Part 2 Products

2.1 THERMAL-BREAK SUB-FRAMING COMPONENTS

- .1 Single Source: use one sub-framing thermal spacer system from a single manufacturer for the entire project.
- .2 Sub-framing Thermal Spacer Systems:
 - .1 General: select sub-framing thermal spacer system best suited to the cladding system being supported and site conditions.
 - .2 Sub-framing Thermal Spacer: Steel clip with integral glass fibre reinforced thermal isolator pad and adjustable depth
 - .1 Depth: as required to suit site conditions and insulation thickness x 50 mm wide, or as indicated on Drawings.
 - .2 Thickness: 1.6 mm (16 ga) Z-275 galvalume steel grade 33 to ASTM A792.
 - .3 Spacing: as required by delegated design.
 - .4 Fasteners: hot dipped galvanized type as recommended by manufacturer in length to suit wall construction.
 - .5 Shims: as required to remove imperfections in sheathing/stud wall.
 - .6 Standard of Acceptance:
 - .1 ISO Clip, Northern Facades.
- .3 Spacer Fasteners: High hex head washer head with sharp twin threaded design of heat-treated corrosion-resistant coated steel.
 - .1 Fastener for steel framing: ¼"-14, with hex head. Fasteners to be supplied by clip manufacturer, minimum 38mm longer than the clip depth to allow for penetration of the steel substrate.
 - .1 Standard of Acceptance: Leland Industries Inc., Master Driller™ No. 2 Mini Drill Point with DT2000 or NZF3000 coating or approved equivalent.
 - .2 Fastener for cast-in-place concrete and concrete masonry units: ¼"-14 concrete screw with hex head.
 - .1 Standard of Acceptance: Leland Industries Inc., Concrete Screw with DT2000 or NZF3000 coating or approved equivalent.
 - .2 Embedment depth: 38 mm.

- .3 Cladding support sub-framing:
 - .1 Minimum 18-gauge, 33 ksi, factory-punched sheet steel with fastener holes to match thermal spacers.
 - .2 Corrosion resistant coating on sub-framing: Galvalume AZM 150 (AZ 50)
 - .3 Sub-framing profiles: Z-girts and/or hat channels as shown on design drawings. Typically, Z-profile for vertically oriented sub-framing and hat profile for horizontally oriented sub-framing, and additionally as required by cladding manufacturer or Contractor's delegated design structural engineer.
- .4 Dielectric Separator / Isolation Coating: CRL Black Bituminous Paint – aerosol or paint, by C.R. Laurence of Canada, or equivalent.

2.2 FABRICATION

- .1 Use tools and equipment recommended by cladding manufacturer. Comply with manufacturer's recommended fabrication methods and processes.
- .2 Fabricated cladding and components shall comply with details indicated on drawings and comply with submitted engineered shop drawings.
- .3 Cladding shall be factory-fabricated to greatest extent practicable, ready for field installation.

Part 3 Execution

3.1 COMPLIANCE

- .1 Compliance: comply with manufacturer's published installation instructions and illustrations, preparation instructions, technical datasheets, and specifications.
- .2 Meet or exceed the requirements of the National Building Code of Canada.

3.2 EXAMINATION

- .1 Verification of Conditions: verify conditions of substrates previously installed under other Sections or Contracts are acceptable for installation in accordance with manufacturer's written instructions.
- .2 Visually inspect substrate in presence of Consultant.
- .3 Inform Consultant of unacceptable conditions immediately upon discovery.
- .4 Proceed with installation only after unacceptable conditions have been remedied. Commencing with Work means acceptance of conditions.

3.3 COORDINATION

- .1 Coordinate and cooperate with the work of other trades as required.
- .2 Ensure water-resistive air and vapour control membrane has been installed over wall substrates. Ensure that any failed installations are corrected before proceeding with the work of this specification Section.

3.4 ISOLATION COATING

- .1 Apply isolation coating to contact surfaces in contact with cementitious materials, wood materials, and dissimilar metals.
- .2 Apply isolation coating into all drilled holes, onto all fasteners (e.g., bolts, screws, rivets) and between all flat surfaces.
- .3 Generally, 2 – 3 mil thickness is required per application. Each application needs enough product applied so that excess isolation coating “oozes out” during assembly (this will ensure you have created a proper seal).
- .4 Assemble and wipe away any excess product.

3.5 INSTALLATION – THERMALLY-BROKEN SUBSTRUCTURE

- .1 Sub-framing: Ensure thermal spacer type is selected to accommodate orientation of vertical and horizontal sub-framing.
- .2 Sub-framing Thermal Spacer Installation: Install thermal spacers in accordance with spacer manufacturer’s written recommendations.
 - .1 Thermal Spacer Installation: Clip thermal spacer to Z-girt/Hat Channel and fasten girt/channel directly to substrate at centres to be recommended by thermal clip manufacturer and as directed by Contractor’s delegated design structural engineer (P.Eng.).
- .3 Installation sequence for spacers, sub-framing, and insulation – option 1:
 - .1 Pre-punch holes or pre-drill holes in Z-girts/Hat Channels to accommodate fasteners.
 - .2 Position Z-girts/Hat Channels directly over thermal spacer before installation of fasteners.
 - .3 Completely install thermal spacers and screws for first Z-girt/Hat Channels. For any subsequent girts/channels:
 - .1 Fasten top spacer with single screw through Z-girt/Hat Channel and spacer into substrate ensuring spacer can pivot for accurate alignment.
 - .2 Friction fit insulation in place before completing installation of remaining screws to secure Z-girt/Hat Channel and thermal spacers.
 - .3 Ensure insulation is tightly fitted with sides of insulation slightly compressed at each insulation spacer.
 - .4 Ensure insulation pieces are in contact with no linear gaps between spacers.
- .4 Installation sequence for spacers, sub-framing, and insulation – option 2:
 - .1 Pre-punch or pre-drill holes in Z-girts/Hat Channels to accommodate fasteners.
 - .2 Position Z-girts/Hat Channels directly over thermal spacer before installation of fasteners.
 - .3 Completely install spacers, screws and sub-framing, prior to installing insulation.
 - .4 Friction fit insulation in place as follows:
 - .1 For semi-rigid insulation batts or boards, notch the batts at the location of the clip to match the top and bottom of the clip.

- .2 Push insulation into place, compressing it at the clip location, and ensuring no linear gaps in the adjacent insulation boards on either side of the clip.
- .3 Flatten board against substrate, if necessary, with corrosion-resistant stick pins or other mechanical insulation retention devices 400 mm maximum on centre along centreline of insulation batts or boards and in accordance with insulation manufacturer's written recommendations.
- .5 After placement and installation of the thermal clips, fill all voids around clips with foam insulation, to re-establish continuity of thermal performance. Shave off any excess to leave a flush, continuous surface at the insulating form exposed face.
- .1 Install semi-rigid insulation and Z-girts/hat channels after completing this procedure at thermal clip locations.

3.6 CLEANING

- .1 Progress Cleaning: clean in accordance with Section 01 74 11 - Cleaning. 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. Perform cleaning after installation to remove construction and accumulated environmental dirt.
- .3 Manage and dispose of demolition and construction waste materials in accordance with Section 01 74 19 – Waste Management and Disposal.

3.7 PROTECTION

- .1 Protect installed products and components from damage during construction.
- .2 Repair damage to adjacent materials caused by Work of this Section.

3.8 SCHEDULE

- .1 Supply and install at cladding locations; coordinate locations with Drawings.

END OF SECTION

Part 1 General

1.1 RELATED REQUIREMENTS

- .1 Section 04 22 00 – Unit masonry.
- .2 Section 07 46 19 – Steel Siding.
- .3 Section 08 44 13 – Glazed Aluminum Framed Assemblies.

1.2 REFERENCES

- .1 Underwriters Laboratories of Canada (ULC).
 - .1 CAN/ULC S770: Standard Test Method for Determination of Long-Term Thermal Resistance of Closed-Cell Thermal Insulating Foams
 - .2 CAN/ULC-S704.1:2017: Standard for Thermal Insulation, Polyurethane and Polyisocyanurate, Boards, Faced
 - .3 CAN/ULC-S102.2:2018: Standard test method of test for surface burning characteristics of flooring, floor coverings, and miscellaneous materials and assemblies.
 - .4 CAN/ULC S102-18, Standard Method of Test for Surface Burning Characteristics of Building Materials and Assemblies.
 - .5 ULC 701.1-17, Standard for Thermal Insulation, Polystyrene, Boards.
 - .6 CAN/ULC S702.1:2014-AMD1, Standard for Mineral Fibre Thermal Insulation for Buildings, Part 1: Material Specification.
 - .7 CAN/ULC S702.2-15, Mineral Fibre Thermal Insulation for Buildings, Part 2: Application Guidelines.
 - .8 CAN/ULC S770: Standard Test Method for Determination of Long-Term Thermal Resistance of Closed-Cell Thermal Insulating Foams
 - .9 CAN/ULC-S704.1:2017: Standard for Thermal Insulation, Polyurethane and Polyisocyanurate, Boards, Faced
 - .10 CAN/ULC S114, Standard Method of Test for Determination of Non-combustibility in Building Materials

1.3 PRE-INSTALLATION MEETINGS

- .1 Pre-Installation Meetings: convene pre-installation meeting one week prior to beginning work of this Section and on-site installation, with contractor's representative and Consultant in accordance with Division 01 General Requirements to:
 - .1 Verify project requirements.
 - .2 Review installation and substrate conditions.
 - .3 Coordination with other building trades.
 - .4 Review manufacturer's installation instructions.

1.4 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Submit in accordance with Division 01 General Requirements.
- .2 Product Data:
 - .1 Submit manufacturer's printed product literature, specifications and technical datasheet.

- .3 Manufacturer's Instructions:
 - .1 Submit manufacturer's installation instructions.
- .4 Submit warranties.

1.5 QUALITY ASSURANCE

- .1 Test Reports: certified test reports showing compliance with specified performance characteristics and physical properties.
- .2 Certificates: product certificates signed by manufacturer certifying materials comply with specified performance characteristics, criteria, and physical requirements.
- .3 Mock-ups:
 - .1 Mock-up #1: Mineral wool cavity insulation: show staggered/offset joints of board layers, tightness of joints, tightness around thermal clips and girts, and mechanically fastened securement.
 - .2 Mock-up #2: Polyisocyanurate cavity insulation: show securement (tightness to wall substrate), tightness around fixtures and perimeter joints, etc.
 - .3 Mock-up #3: Mineral wool cant: show positioning, alignment, and securement of cant.

1.6 DELIVERY, STORAGE, AND HANDLING

- .1 Storage and Handling Requirements:
 - .1 Protect insulation materials from physical damage and from deterioration by moisture, soiling, and other sources. Store inside and in a dry location. Comply with manufacturer's written instructions for handling, storing, and protecting during installation.
 - .2 Protect insulation as follows:
 - .1 Do not expose to sunlight, except to extent necessary for period of installation and concealment.
 - .2 Protect against ignition at all times. Do not deliver insulating materials to Project site before installation time.
 - .3 Complete installation and concealment of materials as rapidly as possible in each area of construction.

1.7 WARRANTIES

- .1 Contractor agrees to correct any deficiencies of labour or material found in the work performed for a period of 2-years from date of Substantial Performance.

Part 2 Products

2.1 POLYISOCYANURATE WALL CAVITY INSULATION

- .1 Rigid polyisocyanurate insulation board designed for cavity wall rain screen applications; to CAN/ULC S704.1, Type 2, Class 2, with the following characteristics:
 - .1 Thickness: 100mm, as indicated.
 - .2 Size: 1220 mm x 2440 mm.

- .3 Thermal resistance (LTTR): r-value 5.7, for 25mm thickness.
- .4 Flame Spread: >25, <500, to CAN/ULC S102.
- .5 Water Absorption: 1.1% by volume.
- .6 For use at brick veneer assembly.
- .7 Standard of Acceptance:
 - .1 Sopra-ISO V Plus, by Soprema.
 - .2 Acceptable alternate: products meeting or exceeding the standard of acceptance.
- .8 Accessory: spray foam; used to fill joints in boards.

2.2 MINERAL WOOL WALL CAVITY INSULATION

- .1 Semi-rigid mineral wool insulation board designed for cavity wall rain screen applications; Type IVB, to ASTM C612, with the following characteristics:
 - .1 Thickness: install in two layers.
 - .1 Inner layer: 50mm.
 - .2 Outer layer: 100mm.
 - .2 Non-combustible, to CAN/ULC S114.
 - .3 Density: minimum 5.3 lbs/ft³
 - .4 For use at metal cladding assembly.
 - .5 Acceptable Material:
 - .1 CavityRock, by Rockwool
 - .2 Rainbarrier, by Thermafiber
 - .3 Approved alternate.

2.3 MINERAL WOOL CANT

- .1 High-density mineral wool insulation board with a bitumen coated top surface; to ASTM C726, with the following characteristics:
 - .1 Thickness: 100mm.
 - .2 Non-combustible, to CAN/ULC S114.
 - .3 Density: dual density:
 - .1 Top layer: 13.75 lbs/ft³
 - .2 Bottom layer: 9.35 lbs/ft³
 - .4 For use at through-wall membrane flashing locations.
 - .5 Standard of Acceptance:
 - .1 Toprock DD Plus, by Rockwool

2.4 BASE OF WALL INSULATION

- .1 Polyisocyanurate insulation, per 2.1 POLYISOCYANURATE WALL CAVITY INSULATION.
 - .1 Thickness: 75mm. Installed in 2 layers.
 - .2 For use with cement board cladding at base of metal cladding wall.

2.5 CURTAINWALL FRAMES

- .1 Extruded polystyrene (XPS) to CAN/ULC S701.
 - .1 Thickness: 75 mm.
 - .2 For use at glazing pocket of curtainwall frames (pocket filler).

2.6 ACCESSORIES

- .1 Fastener assembly for board insulation at wall cavity areas:
 - .1 Purpose made fastener and washer assembly designed to mechanically secure cavity wall board insulation in rain screen applications. Fasteners to be intended for concrete block substrates, hot dipped galvanized minimum corrosion resistance. Washers to be high density polyethylene, nominal 75mm diameter.
 - .2 Acceptable material:
 - .1 Thermal-Grip, by Trufast
 - .2 Approved equal.
 - .3 Wedge-Lok insulation support/retainer, per Section 04 22 00, Unit Masonry; for use at brick veneer assemblies.

Part 3 Execution

3.1 MANUFACTURER'S INSTRUCTIONS

- .1 Compliance: comply with manufacturer's printed installation instructions, data sheets, standard details, and specifications.

3.2 EXAMINATION

- .1 Examine substrates and immediately inform Consultant in writing of defects.
- .2 Prior to commencement of work, ensure:
 - .1 Substrates are firm, straight, smooth, dry, free of snow, ice or frost, and clean of dust and debris.

3.3 SEQUENCING

- .1 Do not perform the Work of this Section until the installation of air barriers and waterproofing membranes have been reviewed and accepted by the Consultant. Refer to Section 07 27 14 - Air and Vapour Barriers.

3.4 GENERAL

- .1 Install insulation in accordance with insulation manufacturer's installation instructions, illustrations and technical datasheets.
- .2 Fit courses of insulation between confining obstructions in cavity; butt edges tightly in vertical and horizontal directions and as follows:
- .3 Install insulation after building substrate materials are dry.
- .4 Use only insulation boards that are dry and unsoiled.
- .5 Install insulation to maintain continuity of thermal protection to building elements and spaces.

- .6 Use largest possible dimensions to reduce number of joints.
- .7 Install insulation to maintain continuous thermal insulation for building spaces and elements.
- .8 Cut and trim insulation neatly to fit spaces. Butt edges and ends tight. Fit insulation tight against mechanical, electrical, and other items protruding plane of insulation. Fill voids with foamed-in-place insulation compatible with installed insulation.
- .9 Install insulation horizontally.
 - .1 Offset vertical joints minimum 300 mm.
- .10 Do not enclose or cover insulation until it has been reviewed by Consultant.

3.5 BASE OF WALL INSULATION

- .1 Install rigid board insulation at foundations with a combination of mechanical fasteners and compatible adhesive in accordance with manufacturer's published instructions, and as follows:
 - .1 Install rigid insulation boards in two layers at base of metal cladding walls, as indicated.
 - .2 Height varies (relative to steps in foundation and existing grade). Verify dimensions and cut boards to suit, to achieve snug fit.
 - .3 Apply adhesive to the substrate by the "dab" method not less than 10 mm x 20 mm size at 150 mm centres; bed the insulation in the adhesive before the adhesive loses its tack or skins over.
 - .4 Mechanical fastening: as required to ensure insulation is secured tightly to substrate.

3.6 POLYISOCYANURATE WALL CAVITY INSULATION

- .1 Install boards in one layer with tight joints.
- .2 Spray foam: Install foam at areas where board joints are not tight, such as around perimeter (where board ends abut substrates), at fixtures, at masonry ties, etc.
- .3 Secure insulation using 'Wedge-Lok' retainer clips at each masonry tie, per Section 04 22 00, Unit Masonry.
- .4 Install specified retainer clips in accordance with insulation manufacturer's recommendations.

3.7 MINERAL WOOL WALL CAVITY INSULATION

- .1 Install insulation in two layers, as indicated.
- .2 Stagger end joints and offset joints between layers.
- .3 Secure insulation tight to substrate with specified fastener assembly.
- .4 Install 6 fasteners per 1220 mm x 2440 mm board, minimum.
- .5 Install specified fastener assembly in accordance with insulation manufacturer's recommendations.

3.8 MINERAL WOOL CANT

- .1 Cut mineral wool boards into cant shapes indicated, to provide a 45 degree slope to the exterior.
- .2 Adhere or mechanically fasten cants to substrate.

3.9 FIELD QUALITY CONTROL

- .1 Field Inspection: Periodic reviews by the Consultant.
- .2 Manufacturer's Services:
 - .1 Have manufacturer review work involved in handling, installation, protection, and cleaning of insulation and accessories. Report any inconsistencies from manufacturer's recommendations immediately to Consultant.

3.10 CLEANING

- .1 Progress Cleaning: clean in accordance with Division 01 General Requirements. Leave Work area clean at end of each day.
- .2 Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment in accordance with Division 01 General Requirements. Perform cleaning after installation to remove construction and accumulated environmental dirt.
- .3 Manage and dispose of demolition and construction waste materials in accordance with Division 01 General Requirements.

3.11 PROTECTION

- .1 Protect installed products and components from damage during construction.
- .2 Repair damage to adjacent materials caused by Work of this Section.

END OF SECTION

Part 1 General

1.1 SUMMARY

- .1 Work of this Section includes the following:
 - .1 Wall air/vapour barrier membrane.
 - .2 Membrane flashing at wood window bucks.
 - .3 Through-wall flashing at lintels and head of windows.
 - .4 Tie-in to roofing.
 - .5 Accessories including metal flashings, and sealants.

1.2 RELATED SECTIONS

- .1 Section 04 22 00, Unit Masonry.
- .2 Section 07 46 19, Steel Siding.
- .3 Section 07 62 00, Sheet Metal Flashing and Trim.
- .4 Section 08 11 14, Metal Doors and Frames.
- .5 Section 08 44 13, Glazed Aluminum Framed Assemblies.

1.3 REFERENCES

- .1 ASTM International (ASTM)
 - .1 ASTM D1970/D1970M-11, Standard Specification for Self-Adhering Polymer Modified Bituminous Sheet Materials Used as Steep Roofing Underlayment for Ice Dam Protection.
- .2 ICC-ES AC-38, Water resistive Barriers.
- .3 Underwriters Laboratories' of Canada (ULC).
 - .1 CAN/ULC-S741-08(R2020), Standard for Air Barrier Materials – Specification.
 - .2 CAN/ULC-S742-11(R2020), Standard for Air Barrier Materials – Specification.

1.4 DEFINITIONS

- .1 Air / Vapour Barrier: Systems of materials exhibiting both low air leakage (airtight) and low Vapour Permeance (vapour impermeable) levels, and functioning as a combined Air Barrier and Vapour Retarder.
- .2 Vapour Permeance: The moisture transmission rate of a material is referred to as its 'permeability'. This number is not dependent on the material's thickness. Its 'permeance', however, is dependent on thickness much like the R-value in heat transmission. Dividing the 'permeability' of a material by its thickness gives the material's 'permeance'.

1.5 ADMINISTRATIVE REQUIREMENTS

- .1 Coordination:
 - .1 Select products to be compatible with adjoining membranes previously installed under related Sections
 - .2 Select products from a single manufacturer, or products that are compatible from different manufacturers.

- .3 Coordination between all installers of each component of vapour and air retarder system is essential to ensure continuity of system and that junctions between the various components are effectively sealed.
- .4 Verify with manufacturers and all tradesmen involved with installation procedures of building products incorporated into air/vapour barrier elements including, but not limited to, various membranes, coating and sealants as well as continuity with roofing membrane.
- .2 Pre-installation Meeting:
 - .1 Convene one week before commencing Work of this Section.
- .3 Sequencing:
 - .1 Sequence work in accordance with Construction Progress Schedule.
 - .2 Sequence work to permit installation of materials in conjunction with related materials and seals.
 - .3 Overlap (shingle) materials to direct water down and away from the structure.

1.6 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Submit in accordance with Division 01 General Requirements.
- .2 Submit Product Data:
 - .1 Submit manufacturer's printed product literature, specifications, and datasheets, and include product characteristics, performance criteria, physical size, finish, and limitations.
 - .2 Submit statement from manufacturer(s), indicating products supplied under this Section are compatible with one another and with products previously installed under the work of related Sections.
- .3 Quality Assurance Submittals:
 - .1 Certificates: submit certificates signed by manufacturer certifying that materials comply with specified performance characteristics and physical properties.
 - .2 Manufacturer's Instructions: submit manufacturer's installation instructions and special handling criteria, installation sequence, cleaning procedures.

1.7 QUALITY ASSURANCE

- .1 Applicator: company specializing in performing work of this section with minimum 3 years documented experience with installation of air/vapour barrier systems.
 - .1 Completed installation must be approved by the material manufacturer.
- .2 Existing Substrate Condition: report deviations, as described in PART 3 - EXAMINATION in writing to Consultant.

1.8 MOCK-UP

- .1 Construct mock-up in accordance with Division 01 General Requirements.
- .2 Construct typical exterior membrane flashing at window perimeter; illustrating materials interface and seals.
- .3 Locate where directed by consultant.
- .4 Mock-up may remain as part of finished work.

- .5 Allow review of mock-up by Consultant before proceeding with installation Work. Accepted mock-up will demonstrate minimum standard of quality required for this project.

1.9 DELIVERY, STORAGE AND HANDLING

- .1 Deliver, store and handle materials in accordance with Section 01 61 00 – Material and Equipment Requirements.
- .2 Deliver, store and handle materials in accordance with manufacturer's written instructions.

1.10 AMBIENT CONDITIONS

- .1 Install solvent curing sealants and vapour release adhesive materials in open spaces with ventilation.
- .2 Ventilate enclosed spaces in accordance with Division 01 General Requirements.
- .3 Maintain temperature and humidity recommended by materials manufacturer before, during and after installation.

1.11 WARRANTIES

- .1 Contractor agrees to correct any deficiencies of labour or material found in the work performed for a period of 2 years from date of Substantial Performance.

Part 2 Products

2.1 SELF-ADHESIVE AIR/VAPOUR BARRIER

- .1 Primer: SBS synthetic rubbers, adhesive resins and solvents used to prime porous substrates to enhance adhesion of self-adhesive membranes at temperatures above -10°C.
 - .1 Acceptable Materials: as recommended by membrane manufacturer for substrate and site conditions.
- .2 Winter Grade: Air and Vapour Barrier Membrane: to CAN/CGSB 37.56 or ASTM D1970; SBS-modified bitumen, self-adhering sheet membrane with polyethylene facer, for application temperatures between -10°C and 10°C, and as follows:
 - .1 Thickness: 1 mm to 1.5 mm
 - .2 Tensile strength: 11.3 kN/m to 15.4 kN/m to ASTM D5147.
 - .3 Ultimate elongation: 25% to 40%
 - .4 Flexibility at cold temperature: minimum -30°C
 - .5 Air permeability: <0.0003 L/sec. m²
 - .6 Water vapour permeability: <0.05 perm
 - .7 Static puncture: minimum 178 N
 - .8 Tear resistance: 375 to 400 N
 - .9 Lap adhesion: 800 N/m

- .10 Standard of Acceptance:
 - .1 Blueskin SALT, Bakor.
 - .2 CCW-705LT, Carlisle
 - .3 Bituthene 3000 Low Temperature Membrane, Grace Construction Products.
 - .4 Exoair 110 LT, Tremco Inc.
 - .5 Sopraseal Stick 1100 T, Soprema.
 - .6 Air Shield LT, W.R. Meadows.
 - .7 Aquabarrier AVB LT, IKO.
- .11 Acceptable alternative: 3015NP, by 3M.
- .3 Summer Grade: Air/Vapour Barrier Membrane: to CAN/CGSB 37.56 or ASTM D1970; SBS modified bitumen, self-adhering sheet membrane with polyethylene facer, for application temperature above 5°C, and as follows:
 - .1 Thickness: 1 mm to 1.5 mm
 - .2 Tensile strength: minimum 6 kN/m
 - .3 Ultimate elongation: 25% to 40%
 - .4 Flexibility at cold temperature: minimum -17°C
 - .5 Air permeability: <0.0003 L/sec. m²
 - .6 Water vapour permeability: <0.05 perm
 - .7 Static puncture: 400 N
 - .8 Tear resistance: 375 to 400 N
 - .9 Lap adhesion: minimum 1750 N/m
 - .10 Standard of Acceptance:
 - .1 Blueskin SA, Bakor.
 - .2 CCW 705, Carlisle.
 - .3 AquaBarrier AVB, IKO.
 - .4 Exoair 110, Tremco Inc.
 - .5 Sopraseal Stick 1100, Soprema.
 - .6 Air Shield, W.R. Meadows.
 - .7 Aquabarrier AVB, IKO.
 - .11 Acceptable alternative: 3015NP, by 3M.
- .4 Waterproofing Mastic: solvent-based mastic containing SBS modified bitumen, fibres and mineral fillers, used to seal around penetrations and extrusions.
 - .1 Compatibility: With air/vapour barrier membrane, substrate, and insulation.
 - .2 Specific gravity at 20°C: 1.0 kg/l to 1.12 kg/l
 - .3 Application Temperature: -10°C to +35°C
 - .4 Solids by Weight: 70% to 83 %
 - .5 Standard of Acceptance:
 - .1 Air-Bloc 21 or Air-Bloc 230-21 Adhesive, Henry Bakor.
 - .2 570-05 Polybitume, Henry Bakor
 - .3 925 BES Sealant, Henry Bakor
 - .4 Exoair Termination Mastic, Tremco Inc.

- .5 Roofcraft AquaBarrier Mastic, IKO.
- .6 Sopreamastic, Soprema.
- .7 Pointing Mastic, W.R. Meadows.
- .8 Aquabarrier Mastic, IKO.

2.2 THROUGH-WALL FLASHING MEMBRANE

- .1 Same as specified in 2.1, SELF-ADHESIVE AIR/VAPOUR BARRIER.

2.3 TRANSITION MEMBRANE

- .1 Same as specified in 2.1, SELF-ADHESIVE AIR/VAPOUR BARRIER.

2.4 ACCESSORIES

- .1 Thinners and cleaners: as recommended by sheet material manufacturer.
- .2 Termination bar: aluminum flat bar, 3mm thick x 25mm wide, pre-punched at 152mm on center.
- .3 Primers and Adhesives: all primers and adhesives shall be manufactured by the air barrier system manufacturer and compatible with systems installed:
 - .1 Adhesive Primer for primary self-adhering membrane at all temperatures; synthetic rubber-based adhesive, quick setting.
 - .2 Adhesive with low-VOC content for self-adhering membranes at all temperatures; synthetic rubber-based adhesive, quick setting.
 - .3 Primer for self-adhering membranes at temperatures above -4°C; polymer emulsion-based adhesive, quick setting.
- .4 Penetration and Termination Sealants: all penetration and termination sealants shall be manufactured by the air/vapour barrier system manufacturer and compatible with systems installed.
 - .1 Termination Sealant shall be moisture cure, medium modulus polymer modified sealing compound.
 - .2 Termination sealant shall be a non-sag, non-staining, one component, high performance thermoplastic sealant.
- .5 Fasteners: supply stainless steel screws, plastic clips and other fasteners as recommended by manufacturer required for complete installation of work.

Part 3 Execution

3.1 MANUFACTURER'S INSTRUCTIONS

- .1 Compliance: prepare surfaces and Work and install products in accordance with manufacturers' printed preparation and installation instructions, typical details, and datasheets.

3.2 ENVIRONMENTAL REQUIREMENTS

- .1 All membrane shall be installed at surface and ambient temperature of 5°C or above, in dry weather conditions.
- .2 For applications below 5°C consult membrane manufacturer's technical representative for instructions and, obtain Consultant's approval before proceeding with Work.

3.3 COORDINATION

- .1 Coordinate with other trades as required to ensure continuity of air barrier and vapour retarder performance at entire enclosure perimeter. Tie-in to adjacent systems as required, and seal transitions.

3.4 EXAMINATION AND PREPARATION

- .1 Verify that surfaces and conditions are ready to accept work of this section.
- .2 Ensure surfaces are clean, dry, sound, smooth, and continuous, and comply with air barrier manufacturer's requirements.
- .3 Remove loose or foreign matter, which might impair adhesion of materials.
- .4 Ensure substrates are clean of oil or excess dust; masonry joints struck flush, and open joints filled; and concrete surfaces free of large voids, spalled areas or sharp protrusions.
 - .1 Refer to Section 04 05 13, Masonry Mortar and Grouting.
- .5 Do not install materials during rain or snowfall.
- .6 Report unsatisfactory conditions to Consultant in writing.
- .7 Ensure mineral wool cants at through-wall flashing locations are installed and secured.
- .8 Do not start work until deficiencies have been corrected. Beginning of Work implies acceptance of conditions.
- .9 Gaps greater than 12 mm shall have sheet metal backing installed, to Section 07 62 00 – Metal Flashing and Trim.

3.5 INSTALLATION

- .1 Ensure substrates are ready to receive membranes and preparation work for masonry substrates, per Section 04 05 13, has been completed prior to proceeding with priming and membrane installation work.
- .2 Use winter or summer grade air/vapour barrier membrane materials as required to suit conditions.
- .3 Application of Substrate Adhesive Primer for air/vapour barrier:
 - .1 Required Adhesive Primer for SBS Modified Self-Adhered Membranes:
 - .1 For the application of SBS modified self-adhered window sill flashings, through-wall flashings and other applications of SBS modified self adhered transition membranes, the substrate shall be conditioned with applicable primer.
 - .2 Apply primer at rate recommended by manufacturer to all areas to receive SBS modified self-adhering sheet membrane by roller and allow to dry.

ISSUED FOR TENDER

- .3 Primed surfaces not covered by self-adhering membrane or self-adhering through-wall flashing membrane during the same working day shall be re primed.
- .4 To the extent practicable, pre-cut membrane to manageable lengths each day.
- .5 Install multiple courses in shingle fashion at overlaps to properly shed water and avoid reverse laps. Use a non-metallic roller to apply membrane firmly and evenly to substrate; blind nail within lap to be covered to hold in place during cold weather applications.
- .6 Apply through-wall flashing membrane at base of walls, and head of windows, as detailed.
 - .1 Apply adhesive primer to surfaces and allow to dry, press membrane firmly into place, over lap minimum 50 mm at all side and end laps. Promptly roll all laps and membrane to ensure the seal.
 - .2 Applications shall form a continuous flashing membrane and shall extend up a minimum of 200 mm up the back-up wall.
 - .3 Seal the top edge of the membrane with termination bar and sealant, where indicated. Trowel-apply a feathered edge to seal termination to shed water.
 - .4 Provide "end dam" flashing at lintels.
- .7 Seal membrane terminations, heads of mechanical fasteners, masonry tie fasteners, around penetrations, duct work, electrical and other apparatus extending through the primary air/vapour barrier and weather barrier membranes and around the perimeter edge of membrane terminations at windows and door frames with specified termination sealant.

3.6 FIELD QUALITY CONTROL

- .1 Manufacturer's Field Services:
 - .1 Provide manufacturer's field services consisting of product use recommendations and periodic site visits for inspection of product installation in accordance with manufacturer's instructions.
 - .2 Schedule site visits to review Work as required.
- .2 The Consultant shall inspect installed membrane for continuity of air/vapour barrier prior to placement of insulation.
- .3 Replace defective materials and materials damaged due to faulty installation, careless handling or other causes resulting from work of this section.

3.7 CLEANING

- .1 Progress Cleaning: clean in accordance with Division 01 General Requirements. Leave Work area clean at end of each day.
- .2 Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment in accordance with Division 01 General Requirements. Perform cleaning after installation to remove construction and accumulated environmental dirt.
- .3 Manage and dispose of demolition and construction waste materials in accordance with Division 01 General Requirements.

3.8 PROTECTION

- .1 Protect installed products and components from damage during construction.
- .2 Repair damage to adjacent materials caused by Work of this Section.

END OF SECTION

Part 1 General

1.1 RELATED REQUIREMENTS

- .1 Section 05 50 00 – Metal Fabrications.
- .2 Section 07 05 43 - Cladding Support Systems.
- .3 Section 07 21 13 – Board Insulation.
- .4 Section 07 27 14 - Air and Vapour Barriers.
- .5 Section 07 62 00 - Sheet Metal Flashing and Trim.
- .6 Section 07 92 00 - Joint Sealants.

1.2 REFERENCES

- .1 ASTM International (ASTM)
 - .1 ASTM A653/5653M-18, Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
 - .2 ASTM D2369-10(2015)e1, Test Method for Volatile Content of Coatings.
 - .3 ASTM D2832-92(2016), Standard Guide for Determining Volatile and Nonvolatile Content of Paint and Related Coatings.
 - .4 ASTM D5116-17, Standard Guide For Small-Scale Environmental Chamber Determinations of Organic Emissions From Indoor Materials/Products.
 - .5 ASTM D5206-13, Standard Test Method for Windload Resistance of Rigid Plastic Siding.
 - .6 ASTM F1667-18a, Standard Specification for Driven Fasteners: Nails, Spikes, and Staples.
- .2 CSA Group (CSA)
 - .1 CSA G40.20-13/G40.21-13(R2018), General Requirements for Rolled or Welded Structural Quality Steel/Structural Quality Steel.
 - .2 CSA W59-18, Welded Steel Construction (Metal Arc Welding).
 - .3 CSA W55.3-08(R2018), Certification of companies for resistance welding of steel and aluminum.

1.3 PRE-INSTALLATION MEETING

- .1 Convene pre-installation meeting one week prior to beginning work of this Section and on-site installation, with Contractor, Consultant, installer, manufacturer's representative to:
 - .1 Verify project requirements.
 - .2 Review installation and substrate conditions.
 - .3 Coordination with other building subtrades.
 - .4 Timing and sequencing of spray applied foam insulation.
 - .5 Review manufacturer's installation instructions and warranty requirements.
- .2 Manufacturer's representative shall also provide frequent inspection visits during the course of work of this Section to assure quality and competence of membrane installation and panel alignment.

1.4 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Submit in accordance with Section 01 33 00 – Submittal Procedures:
- .2 Product Data:
 - .1 Submit manufacturer's printed product literature, specifications and datasheet.
- .3 Shop Drawings:
 - .1 Shop drawings shall be engineered, and bear the stamp and signature of Contractor's designated design engineer. Include calculations used to establish structural designs.
 - .2 Indicate layout, profiles and product components including anchorage, accessories, finish colours and textures.
 - .3 Include details showing thickness and dimensions of the various system parts, fastening and anchoring methods, locations of joints and gaskets and location and configuration of movement joints.
- .4 Samples:
 - .1 Submit duplicate 300 x 300 mm samples of wall system, representative of materials, finishes and colours.
 - .2 Prior to ordering materials, provide to consultant the following for verification purposes: three samples of colour of finish specified.
- .5 Manufacturer's Instructions:
 - .1 Submit manufacturer's installation instructions.
- .6 Manufacturers' Field Reports: Submit copies of manufacturers field reports.

1.5 QUALITY ASSURANCE

- .1 Test Reports: certified test reports showing compliance with specified performance characteristics and physical properties.
- .2 Certificates: product certificates signed by manufacturer certifying materials comply with specified performance characteristics and criteria and physical requirements.
- .3 Installer Qualifications: Engage experienced installer, with a minimum of 5 years experience, who has completed systems similar in material, design, and extent to that indicated for Project and with record of successful performance.
- .4 Delegated design: retain a professional engineer, registered in the province of the Work, to design fabrication and erection of the Work of this specification section in accordance with NBC and Amendments, and Contract Document requirements including, but not limited to, the following:
 - .1 Seal and signature to shop drawings and design submittals requiring structural engineering.
 - .2 Field review of installed components.
 - .3 Completion of Letters or Commitment and Supervision.

1.6 MOCK-UPS

- .1 Construct mock-up in accordance with Section 01 45 00 – Quality Control.
- .2 Construct a portion of one exterior wall in location agreed upon by Consultant to establish a standard of construction, workmanship, and appearance.

- .3 Construct mock-up indicating relationship between wall panels, air spaces, air/vapour retarder membrane, windows, and doors.
- .4 Do not continue with work of this Section until Consultant has approved mock-up.
- .5 Accepted mock-up may remain part of Work

1.7 DELIVERY, STORAGE, AND HANDLING

- .1 Deliver and store materials in accordance with manufacturer's instructions.
- .2 Protect panels during transportation, unloading, storing, and erecting to prevent bending, warping, twisting, and surface damage.

1.8 WARRANTY

- .1 Submit manufacturer's 40-year limited warranty.
- .2 Contractor agrees to correct any deficiencies found in the work performed for a period of 2-years from date of Substantial Performance.

Part 2 Products

2.1 PERFORMANCE AND DESIGN CRITERIA

- .1 Design metal panel wall system in accordance with NBC.
- .2 Design metal panel wall system in accordance with CSA S136.
- .3 Design metal panel wall to provide for thermal movement of component materials caused by ambient temperature range of 60 degrees C without causing buckling, failure of joint seals, undue stress on fasteners or other detrimental effects.
- .4 Include expansion joints to accommodate movement in wall system and between wall system and building structure, caused by structural movements, without permanent distortion, damage to infills, racking of joints, breakage of seals, or water penetration.
- .5 Design members to withstand dead load and wind loads calculated in accordance with NBC and applicable local regulations, to maximum allowable deflection of 1/180th of span.
- .6 Provide for positive drainage of condensation occurring within wall construction and water entering at joints, to exterior face of wall in accordance with NRC "Rain Screen Principles".
- .7 Design wall system to accommodate specified erection tolerances of structure.
- .8 Design wall system to allow for movement of air between exterior and interior side of metal cladding.
- .9 Provide an effective air barrier, to prevent infiltration and/or exfiltration of air through wall assembly.

2.2 STEEL CLADDING

- .1 Factory Roll Formed Galvanized Sheet Steel Cladding: Z275 hot dip galvanized sheet steel applied to both sides, commercial steel (CS), type A, structural quality Grade 230 to ASTM A653/A653M and as follows:
 - .1 Nominal Core Steel Thickness (prior to galvanizing): 22 gauge.

ISSUED FOR TENDER

- .2 Standard of Acceptance System and Profile:
 - .1 Vicwest 7/8" Corrugated Cladding
- .3 Direction of Installation / Orientation: as shown.
- .2 Prefinished steel with factory-applied silicone modified polyester.
 - .1 Specular gloss: 30 units +/-5 to ASTM D523.
 - .2 Coating thickness: not less than 25 micrometres.
 - .3 Resistance to accelerated weathering for chalk rating of 8, colour fade 5 units or less and erosion rate less than 20% to ASTM D822 as follows:
 - .1 Outdoor exposure period 1000 hours.
 - .2 Humidity resistance exposure period 1000 hours.
 - .4 Standard of Acceptance:
 - .1 Valspar WeatherXL™ Coil Coating System.
 - .5 Colours:
 - .1 Selected by Consultant from manufacturer's complete colour lines.

2.3 ACCESSORIES

- .1 Steel Coating Requirements - General: Zinc coated steel to meet specified requirements of CSA G164, hot dip galvanized after fabrication, coating designation Z275.
- .2 Thermally-Broken Sub-Girt/Furring System: to Section 07 05 43 - Cladding Support Systems.
- .3 Base flashing: welded aluminum, per Section 05 50 00, Metal Fabrications.
- .4 Exposed joint (perpendicular to profile): ends of cladding sheet shop cut clean and square, backed with tight fitting filler lapping back of joint, exposed components colour matched to cladding.
- .5 Accessories: cap flashings, drip flashings, exterior/internal corner flashings, copings and closures for head, jamb, sill and corners, of same material, thickness and finish as exterior cladding, brake formed to shape.
- .6 Expansion joints: as recommended by Manufacturers Instructions.
- .1 Fasteners:
 - 1. Screws to ANSI B18.6.4, purpose-made to suit application and field conditions.
 - 2. Hot dipped galvanized self-drilling screws suitable to penetrate structural metal stud framing.
 - 3. Head finish:
 - .1 Hot dipped galvanized in concealed locations.
 - .2 Pre-painted hot dipped galvanized metal, colour to match prefinished metal panels in exposed locations.
- .7 Joint Sealants: as indicated in Section 07 92 00 and as recommended by manufacturer. Colour of exposed sealant to match adjacent panel.
- .8 Dielectric Separator / Isolation Coating: CRL Black Bituminous Paint – aerosol or paint, by C.R. Laurence of Canada, or equivalent.

Part 3 Execution

3.1 COMPLIANCE

- .1 Comply with manufacturer's published installation guide, installation details and illustrations, and technical datasheets.
- .2 Meet or exceed requirements of NBC and amendments.

3.2 EXAMINATION

- .1 Verification of Conditions:
 - .1 Examine substrates to receive work and surrounding adjacent surfaces for conditions affecting installation. Coordinate with related sections to ensure proper dimensions are maintained.
 - .2 Verify site dimensions by accurate field measurements so that work will be accurately designed, fabricated and fitted to the structure.
 - .3 All penetrations through the façade for the work of other trades shall be fitted with a watertight sleeve. Verify flashings are in place, sealed with waterproof membrane and covered with building membranes.
 - .4 Maintain sheathing membrane integrity.
- .2 Notify Consultant in writing of any conditions that are not acceptable.
- .3 Proceed with installation after verification and correction of surface conditions acceptable to manufacturer. Commencement of work means acceptance of conditions.

3.3 SEQUENCING AND COORDINATION

- .1 Air barrier and insulation shall be installed, reviewed and in compliance with specifications and drawing details prior to installation of preformed metal siding assembly.
- .2 Coordinate with other trades as required.

3.4 ISOLATION COATING

- .1 Apply isolation coating to contact surfaces in contact with cementitious materials, wood materials, and dissimilar metals.
- .2 Apply coating into all drilled holes, onto all fasteners (e.g., bolts, screws, rivets) and between all flat surfaces.
- .3 Generally, 2 – 3 mil thickness is required per application. Each application needs enough product applied so that excess material “oozes out” during assembly (this will ensure you have created a proper seal).
- .4 Assemble and wipe away any excess product.

3.5 GENERAL FASTENER REQUIREMENTS

- .1 Use metal self-drilling screws provided by the siding manufacturer and designed to penetrate substrate material. Set the screws with moderate contact on the clip part of the panel to avoid impeding the expansion of the metal. The screws must not exert any upward or downward pressure to avoid deforming the siding or opening the panels at the joints. A systematic check of the work must be done for every three or four panels placed in height in order to detect possible anomalies. Remove the protective film from the siding prior to installation to facilitate a good visual inspection of the quality of the installation and in order to make appropriate corrections as installation progresses.

3.6 PREPARATION

- .1 Clean surfaces thoroughly prior to installation.
- .2 Repair substrate flaws or defects before applying siding or soffits.
- .3 Coordinate with other trades as required.

3.7 ERECTION

- .1 Install cladding and trim in accordance with manufacturer's published installation instructions and standard details. Erect in sequence recommended by manufacturer. Use hidden fastening system method of attachment.
- .2 Sheet steel cladding shall be adjusted to final position before being permanently fastened to structural supports. If such supports are improperly aligned, levelled or plumbed, the problem shall be reported to the general contractor in order that the necessary corrections be made before proceeding with the work.
- .3 End laps shall be located over supports. Minimum end laps shall be: 100 mm.
- .4 Side laps shall be connected at intervals not exceeding 600 mm.
- .5 Install continuous starter strips, inside and outside corners, edgings, soffits, drip, cap, sill and window/door opening flashings as required for a complete installation.
- .6 Install outside corners, fillers and closure strips with carefully formed and profiled work.
- .7 Maintain joints in exterior cladding, true to line, tight fitting, hairline joints.
- .8 Attach components in manner not restricting thermal movement.
- .9 Caulk junctions with adjoining work with sealant. Do work in accordance with Section 07 92 00 - Joint Sealants.

3.8 CONTROL/EXPANSION JOINTS

- .1 Construct control and expansion joints as indicated.
- .2 Use cover sheets, of brake formed profile, of same material and finish as adjacent material.
- .3 Use mechanical fasteners to secure sheet materials.
- .4 Assemble and secure wall system to structural frame so stresses on sealants are within manufacturers' recommended limits.

3.9 CONSTRUCTION

- .1 Erection Tolerances: Shim and align panels and cladding system within installed tolerance of 6 mm (1/4") in 6100 mm (20'-0") on level, plumb, and location lines as indicated, and within 3 mm (1/8") offset of adjoining faces and of alignment of matching profiles.

3.10 FIELD QUALITY CONTROL

- .1 Manufacturer's field services: Provide manufacturer's field services consisting of product use recommendations and periodic site visits for inspection of product installation in accordance with manufacturer's instructions.
- .2 Submit reports to Consultant within three days of review and submit.

3.11 ADJUSTMENT AND CLEANING

- .1 After erection, touch up coatings removed or damaged during erection.
- .2 Remove damaged, dented, defaced, defectively finished, or tool marked components and replace with new.
- .3 Wash down exposed surfaces using solution of mild domestic detergent in warm water, applied with soft clean wiping cloths. Wipe interior surfaces clean as part of final clean-up.
- .4 Remove excess sealant with recommended solvent.
- .5 Progress Cleaning: clean in accordance with Section 01 74 11 - Cleaning. Leave Work area clean at end of each day.
- .6 Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment in accordance with Section 01 74 11 - Cleaning. Perform cleaning after installation to remove construction and accumulated environmental dirt.
- .1 Manage and dispose of demolition and construction waste materials in accordance with Section 01 74 19 - Waste Management and Disposal.

3.12 PROTECTION

- .1 Protect installed products and components from damage during construction.
- .2 Repair damage to adjacent materials caused by Work of this Section.

END OF SECTION

Part 1 General

1.1 REFERENCES

- .1 ASTM International (ASTM)
 - .1 ASTM A653/A653M-15e1, Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
 - .2 ASTM F1667-17, Standard Specification for Driven Fasteners: Nails, Spikes, and Staples.
- .2 Canadian Roofing Contractors Association (CRCA)
 - .1 Roofing Specifications Manual (2012).
- .3 Sheet Metal and Air Conditioning Contractors' National Association (SMACNA)
 - .1 SMACNA Architectural Sheet Metal Manual, 7th Edition.

1.2 ADMINISTRATIVE REQUIREMENTS

- .1 Coordination:
 - .1 Coordinate work of this Section with interfacing and adjoining Work for proper sequencing of each installation and to provide positive weather resistance, durability of the work, and protection of materials and finishes.

1.3 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Submittals shall conform to the requirements of Division 01 General Requirements:
- .2 Submit manufacturer's printed product literature, specifications and datasheets, and include product characteristics, performance criteria, physical size(s), finish(es) and constraints.
- .3 Submit shop drawings showing proposed method of shaping, forming, jointing, fastening, and application of flashing and sheet metalwork.
- .4 Submit warranty.

1.4 QUALITY CONTROL

- .1 General: Fabricate and install sheet metal flashing and trim in accordance with SMACNA Architectural Sheet Metal Manual, and to the CRCA Roofing Specifications Manual.
- .2 Sheet Metal Flashing: Comply with the applicable recommendations and guidelines of the CRCA Canadian Roofing Reference Manual, CRCA Specification Manual, and applicable CRCA technical bulletins.

1.5 DELIVERY, STORAGE AND HANDLING

- .1 Stack pre-formed and pre-finished material in manner to prevent twisting bending and rubbing.
- .2 Provide protection for finished surfaces.
- .3 Prevent contact of dissimilar metals during storage and protect from acids, flux, and other corrosive materials and elements
- .4 Protect prefinished surfaces from scratches and from rust staining.

1.6 WARRANTY

- .1 Contractor agrees to correct any deficiencies of labour or material found in the work performed for a period of 5 years from the date of Substantial Performance.
- .2 Provide Warranty for sheet metal flashing and trim to include in maintenance manuals.

Part 2 Products

2.1 PREFINISHED STEEL SHEET

- .1 Hot dip galvanized steel sheet (pre-finished): Type A commercial quality to ASTM A653/A653M, with Z275 designation zinc coating.
 - .1 Class: F1S-Finished one side (manufacturer's standard prime finish on unexposed face).
 - .2 Thickness: minimum 0.70 mm (24 gauge) base galvanized metal thickness.
 - .3 Manufacturer's Coil Coating System: silicone modified polyester (SMP) system, applied over a zinc phosphate pre-treatment, and high-performance, flexible primer.
 - .1 Standard of Acceptance:
 - .1 Vicwest WeatherXL.
 - .4 Colours: to match metal cladding.
 - .5 Locations:
 - .1 Base of profiled metal claddings.
 - .2 Flashing/trim around window perimeters.
 - .3 Closures at metal cladding.
 - .4 Parapet fascias.
 - .5 Through-wall flashing at lintels.

2.2 DOWNSPOUTS

- .1 Form downspouts from specified PRE-FINISHED STEEL SHEET.
- .2 Sizes and profiles: to match existing.

2.3 ACCESSORIES

- .1 Isolation coating: alkali resistant bituminous paint.
- .2 Cleats and hook strips: of same material as sheet metal being secured.
 - .1 Prefinished steel: 0.85 mm (22 gauge) thickness, continuous.
- .3 Self-adhesive underlayment: to ASTM D1970, per Section 07 27 14, Air and Vapour barriers.
- .4 Mastic Sealant: polyisobutylene; non-hardening, non-skinning, non-drying, non-migrating sealant.
- .5 Elastomeric Sealant: Generic type recommended by sheet metal manufacturer and fabricator of components being sealed and complying with requirements for joint sealants.

ISSUED FOR TENDER

- .6 Fasteners: of same material as sheet metal, to ASTM F1667, as recommended by sheet metal manufacturer; non-corrosive. Finish of exposed parts to match material being fastened.
- .7 Screws: #12, unless indicated otherwise, self-drilling with flat or pancake head, to FM Approvals 4470.
 - .1 Length: to achieve 38mm minimum embedment into underlying wood member.
 - .2 Acceptable Manufacturer: Trufast, or approved alternative.
- .8 Nylon Head Fasteners: #12 stainless steel self-drilling screws with integral nylon heads colour matched to pre-finished sheet metal; 38mm length.
 - .1 Standard of acceptance: Master Drillers, by Leland Industries.
- .9 Washers: of same material as sheet metal, 1 mm thick with rubber packings.
- .10 Adhesives: Type recommended by flashing sheet metal manufacturer for waterproof and weather resistant seaming and adhesive application of flashing sheet metal.
- .11 Prefinished Steel Accessories: Provide non-corrosive sheet metal clips, straps, anchoring devices, and similar accessory units as required for installation of Work. Accessories shall match or be compatible with material being installed; size and thickness as required.
- .12 Touch-up paint: as recommended by prefinished material manufacturer.

2.4 FABRICATION

- .1 Fabricate sheet steel flashings and other sheet steel work in accordance with applicable CRCA 'FL' series details and SMACNA architectural details, as indicated.
- .2 Form sections square, true, and accurate to size, free from distortion and other defects detrimental to appearance or performance.
- .3 Form pieces in 2400 mm maximum lengths.
 - .1 Make allowance for expansion at joints.
- .4 Hem exposed edges on underside 12 mm.
 - .1 Mitre and seal corners with sealant.
- .5 Form sections square, true and accurate to size, free from distortion and other defects detrimental to appearance or performance.
- .6 Apply isolation coating to metal surfaces to be embedded in concrete or mortar.

2.5 METAL FLASHINGS

- .1 Form flashings, copings, trims, downspouts, and closures to profiles indicated of prefinished steel.

Part 3 Execution

3.1 MANUFACTURER'S INSTRUCTIONS

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

3.2 EXAMINATION

- .1 Verify that substrates are in good condition and adequately secured.
- .2 Verify that solid wood blocking or sheathing provided to back-up all flashings and that all nails, screws are set and wood provides a smooth flat plane.
- .3 Commencement of Work means acceptance of existing conditions.

3.3 INSTALLATION

- .1 Install sheet metal flashing and trim in accordance with applicable CRCA 'FL' series details, SMACNA's Architectural Sheet Metal Manual, and as indicated.
- .2 Verify shapes and dimensions of surfaces being covered before fabricating sheet metal.
- .3 Ensure underlayment or separation sheets are installed.
- .4 Secure flashings to supporting building elements with concealed continuous cleats or hook strips.
- .5 Anchor units of work securely in place, providing for thermal expansion. Conceal fasteners where possible and set units true to line and level.
- .6 Install work with laps, joints, and seams that are watertight and weatherproof.
- .7 Install exposed sheet metal work that is without oil canning, buckling and tool marks and that is true to line and levels indicated, with exposed edges folded back to form hems. Install sheet metal flashing and trim to fit substrates and to result in waterproof and weatherproof performance.
- .8 Expansion Provisions:
 - .1 Provide for the thermal expansion of exposed sheet metal Work.
 - .2 Space movement joints at maximum of 3050 mm, with no joints allowed within 610 mm of a corner or intersection, or as otherwise indicated per Drawings.
 - .3 Provide slip joints to allow for movement.

3.4 CLEANING

- .1 Progress Cleaning: clean in accordance with HRCE's Requirements. Leave Work area clean at end of each day.
- .2 Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment in accordance with HRCE's Requirements. Perform cleaning after installation to remove construction and accumulated environmental dirt.
- .3 Manage and dispose of demolition and construction waste materials in accordance with Division 01 General Requirements.

3.5 PROTECTION

- .1 Protect installed products and components from damage during construction.
- .2 Repair damage to adjacent materials caused by Work of this Section.

END OF SECTION

Part 1 General

1.1 SECTION INCLUDES

- .1 This Section specifies caulking and sealants not specified in other Sections.
- .2 Refer to other sections for other caulking and sealants.

1.2 RELATED SECTIONS

- .1 Section 04 22 00 – Unit Masonry.
- .2 Section 06 20 00 – Finish Carpentry.
- .3 Section 07 46 19 – Steel Siding
- .4 Section 08 11 14 – Metal Doors and Frames
- .5 Section 08 44 13 – Glazed Aluminum Framed Assemblies

1.3 REFERENCES

- .1 American Society for Testing and Materials International, (ASTM)
 - .1 ASTM C920-11, Standard Specification for Elastomeric Joint Sealants.
- .1 Canadian General Standards Board (CGSB)
 - .1 CAN/CGSB 19.13-M87, Sealing Compound, One-component, Elastomeric, Chemical Curing.
 - .2 CAN/CGSB 19.17-M90, One-Component Acrylic Emulsion Base Sealing Compound.
- .2 Department of Justice Canada (Jus)
 - .1 Canadian Environmental Protection Act, 1999 (CEPA).
- .3 Health Canada/Workplace Hazardous Materials Information System (WHMIS)
 - .1 Material Safety Data Sheets (MSDS).
- .4 Transport Canada (TC)
 - .1 Transportation of Dangerous Goods Act, 1992 (TDGA).

1.4 ACTION AND INFORMATIONAL SUBMITTALS.

- .1 Submit product data in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Manufacturer's product to describe.
 - .1 Caulking compound.
 - .2 Primers.
 - .3 Sealing compound, each type, including compatibility when different sealants are in contact with each other.
- .3 Submit samples in accordance with Section 01 33 00 - Submittal Procedures.
- .4 Submit duplicate samples of each type of material and colour.

- .5 Cured samples of exposed sealants for each color where required to match adjacent material.
- .6 Submit manufacturer's instructions in accordance with Section 01 33 00 - Submittal Procedures.
 - .1 Instructions to include installation instructions for each product used.

1.5 QUALITY ASSURANCE

- .1 Retain purchase orders, invoices and other documents to prove that all materials utilized in this contract meet requirements of the specifications. Produce documents when requested by Consultant.
- .2 Manufacturer's obligations:
 - .1 The manufacturer shall play an active role in the application and inspection of their product during the period of this contract.
 - .2 The manufacturer shall be represented at all relevant meetings by a qualified technical representative, with a minimum of 5 years' experience.

1.6 STORAGE, AND HANDLING

- .1 Deliver, handle, store and protect materials.
- .2 Deliver and store materials in original wrappings and containers with manufacturer's seals and labels, intact. Protect from freezing, moisture, water and contact with ground or floor.

1.7 WASTE MANAGEMENT AND DISPOSAL

- .1 Separate waste materials for reuse and recycling in accordance with Section 01 74 21 - Construction/Demolition Waste Management and Disposal.
- .2 Place materials defined as hazardous or toxic in designated containers.
- .3 Handle and dispose of hazardous materials in accordance with the CEPA, TDGA, Regional and Municipal regulations.
- .4 Unused material must not be disposed of into sewer system, into streams, lakes, onto ground or in other location where it will pose health or environmental hazard.
- .5 Divert unused joint sealing material from landfill to official hazardous material collections site approved by Consultant.
- .6 Empty plastic joint sealer containers are not recyclable. Do not dispose of empty containers with plastic materials destined for recycling.
- .7 Fold up metal banding, flatten, and place in designated area for recycling.

1.8 PROJECT CONDITIONS

- .1 Environmental Limitations:

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- .1 Do not proceed with installation of joint sealants under following conditions:
 - .1 When ambient and substrate temperature conditions are outside limits permitted by joint sealant manufacturer or are below 4.4 degrees C.
 - .2 When joint substrates are wet.
- .2 Joint-Width Conditions:
 - .1 Do not proceed with installation of joint sealants where joint widths are less than those allowed by joint sealant manufacturer for applications indicated.
- .3 Joint-Substrate Conditions:
 - .1 Do not proceed with installation of joint sealants until contaminants capable of interfering with adhesion are removed from joint substrates.

1.9 ENVIRONMENTAL REQUIREMENTS

- .1 Comply with requirements of Workplace Hazardous Materials Information System (WHMIS) regarding use, handling, storage, and disposal of hazardous materials; and regarding labeling and provision of material safety data sheets acceptable to Labour 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.
- .3 Ventilate area of work by use of approved portable supply and exhaust fans.

1.10 EXTENDED WARRANTIES

- .1 For respective trade sections where sealants are used, provide a warranty of five years, for material and workmanship beyond date of Substantial Performance.

Part 2 Products

2.1 SEALANT MATERIALS

- .1 Do not use caulking that emits strong odours, contains toxic chemicals or is not certified as mould resistant in air handling units.
- .2 When low toxicity caulks are not possible, confine usage to areas which off-gas to exterior, are contained behind air barriers, or are applied several months before occupancy to maximize off-gas time.
- .3 Where sealants are qualified with primers use only these primers.

2.2 LOW EMITTING MATERIALS

- .1 Although this project is not seeking LEED certification, all site-applied interior paints, coatings, adhesives, sealants, sealant primers, etc., must conform to VOC content requirements of LEED Canada-NC.

- .2 Submit Material Safety Data Sheets (MSDS) for all products and materials of these types incorporated into the construction of the project as per Section 01 33 00.

2.3 SEALANT MATERIAL DESIGNATIONS

- .1 Type 1: One-component polyurethane sealant; non-sag, for general constructions.
 - .1 To ASTM C920: type S; grade NS; class 25; use NT, M, A, O.
 - .2 Acceptable materials:
 - .1 Polyurethane Sealant 540, 3M Company
 - .2 Dymonic or Dymonic FC, Tremco Inc
 - .3 Multiflex, Chemtron.
 - .4 Sonolastic NP 1, BASF Sonneborn.
 - .5 Sikaflex 1a, Sika.
 - .6 DynaTrol I-XL, Pecora.
- .2 Type 2: Acrylic Latex One Part.
 - .1 To CAN/CGSB-19.17.
 - .2 Acceptable material:
 - .1 Tremco 100 latex.
 - .2 Sonneborn Sonolac.
 - .3 Pecora AC-20 + Silicone.

2.4 ACCESSORIES

- .1 Preformed compressible and non-compressible back-up materials that are non-staining, compatible with joint substrate, sealants, primers, and other joint fillers, and are approved for applications indicated by sealant manufacturer based on site experience and laboratory testing.
 - .1 Rod Type Sealant Backings:
 - .1 ASTM C1330, Type C (closed cell material with a surface skin), Type O (open cell material) or Type B (bi-cellular material with a surface skin).
 - .2 Use any of the preceding types, as approved in writing by joint sealant manufacturer for joint application indicated.
 - .3 Size and density to control sealant depth and otherwise contribute to producing optimum sealant performance.
 - .4 Non-adhering to sealant, to maintain two sided adhesion across joint.
 - .2 Bond Breaker Tape.
 - .1 Polyethylene bond breaker tape which will not bond to sealant.
- .2 Primer: Non-staining type as recommended by sealant manufacturer.
- .3 Joint Cleaner: Non-corrosive solvent type recommended by sealant manufacturer for applicable substrate materials.

2.1 SEALANT SELECTION

- .1 Exterior perimeter of windows at brick veneer: Sealant Type: 1.

- .2 Exterior perimeter of louvers: Sealant Type: 1.
- .3 Exterior perimeter of doors at brick veneer: Sealant Type: 1.
- .4 Cement board panel joints: Sealant Type: 1.
- .5 Interior trims: Type 2.

Part 3 Execution

3.1 PROTECTION

- .1 Protect installed work of other trades from staining or contamination.

3.2 PREPARATION OF JOINT SURFACES

- .1 Examine joint sizes and conditions to establish correct depth to width relationship for installation of backup materials and sealants.
- .2 Clean bonding joint surfaces of harmful matter substances including dust, rust, oil grease, and other matter which may impair work.
- .3 Do not apply sealants to joint surfaces treated with sealer, curing compound, water repellent, or other coatings unless tests have been performed to ensure compatibility of materials. Remove coatings as required.
- .4 Ensure joint surfaces are dry and frost free.
- .5 Prepare surfaces in accordance with manufacturer's directions.

3.3 PRIMING

- .1 Where necessary to prevent staining, mask adjacent surfaces prior to priming and caulking.
- .2 Prime sides of joints in accordance with sealant manufacturer's instructions immediately prior to caulking.

3.4 BACKUP MATERIAL

- .1 Apply bond breaker tape where required to manufacturer's instructions.
- .2 Install joint filler/backer rod 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 APPLICATION

- .1 Sealant:
 - .1 Apply sealant in accordance with manufacturer's written instructions.

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- .2 Mask edges of joint where irregular surface or sensitive joint border exists to provide neat joint.
- .3 Apply sealant in continuous beads.
- .4 Apply sealant using gun with proper size nozzle.
- .5 Use sufficient pressure to fill voids and joints solid.
- .6 Form surface of sealant with full bead, smooth, free from ridges, wrinkles, sags, air pockets, embedded impurities.
- .7 Tool exposed surfaces before skinning begins to give slightly concave shape.
- .8 Remove excess compound promptly as work progresses and upon completion.

- .2 Curing:
 - .1 Cure sealants in accordance with sealant manufacturer's instructions.
 - .2 Do not cover up sealants until proper curing has taken place.

- .3 Cleanup:
 - .1 Clean adjacent surfaces immediately and leave work neat and clean.
 - .2 Remove excess and droppings, using recommended cleaners as work progresses.
 - .3 Remove masking tape after initial set of sealant.

- .4 Defective work:
 - .1 Shall include, but not be restricted to, joint leakage, cracking, crumbling, melting, runny, loss of adhesion, loss of cohesion, or staining of adjoining or adjacent work or surfaces. Contractor to make good any defective sealant work.

END OF SECTION

Part 1 General

1.1 SUMMARY

- .1 This section includes metal products, for doors and frames, as indicated.

1.2 RELATED REQUIREMENTS

- .1 Door Schedule (Sheet A-201).

1.3 REFERENCES

- .1 American National Standards Organization (ANSI) / Steel Door Institute (SDI)
 - .1 ANSI/SDI A250.8-2003 (R2008), Recommended Specifications for Standard Steel Doors and Frames.
- .2 ASTM International (ASTM)
 - .1 ASTM A653/A653M-17, Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
 - .2 ASTM A924 / A924M-17a, Standard Specification for General Requirements for Steel Sheet, Metallic-Coated by the Hot-Dip Process.
- .3 Builders Hardware Manufacturers Association (BHMA)
 - .1 BHMA A156.16-2013, Auxiliary Hardware.
- .4 CSA International (CSA)
 - .1 CSA W47.1-09(R2014), Certification of companies for fusion welding of steel, Includes Update No. 3 (2011), Update No. 5 (2012).
 - .2 CSA W59-18, Welded Steel Construction (Metal Arc Welding).
 - .3 AAMA/WDMA/CSA 101/I.S.2/A440-11, NAFS - North American Fenestration Standard for Windows, Doors, and Skylights.
- .5 Canadian Steel Door Manufacturers' Association (CSDMA)
 - .1 CSDMA Guide Specification for Installation and Storage of Hollow Metal Doors and Frames, 2012.
 - .2 CSDMA Recommended Specifications for Commercial Steel Doors and Frames, 2006.
 - .3 CSDMA, Selection and Usage Guide for Commercial Steel Doors, 2009.
- .6 The Society for Protective Coatings (SSPC)
 - .1 SSPC-PS 12.01, One Coat Zinc-Rich Painting System (Includes 2004 Revisions).
 - .2 SSPC-PS Guide 12.00, Guide to Zinc-Rich Coating Systems , 03/01/2007.
- .7 Underwriters' Laboratories of Canada (ULC)
 - .1 CAN/ULC-S704-03, Standard for Thermal Insulation, Polyurethane and Polyisocyanurate Boards, Faced.

1.4 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Submit in accordance with Division 01 General Requirements.
- .2 Submit Product Data:

- .1 Submit manufacturer's printed product literature, specifications and data sheets for each type of door and frame specified.
- .3 Submit Shop Drawings:
 - .1 Indicate general construction of each type of frame, configurations, material, material thickness, jointing methods, mortises, reinforcements, anchors, arrangement of hardware, fire ratings, finish and special features.
 - .2 Reference frame types to Door Schedule. Indicate door numbers where applicable.

1.5 QUALITY ASSURANCE

- .1 Manufacturer/Fabricator: member in good standing of the Canadian Steel Door and Frame Manufacturer's Association.
- .2 Installer: Use installers who are experienced with the installation of hollow metal doors and frames of similar complexity and extent to that required for the Project.
- .3 Manufacture door and frame assemblies to ANSI/SDI A250.8.

1.6 DELIVERY, STORAGE, AND HANDLING

- .1 Deliver, store and handle materials in accordance with Division 01 General Requirements, and as follows:
 - .1 Receive and store materials as recommended by materials manufacturer.
 - .2 Adequately protect surfaces from damage during moving, handling and storage.

Part 2 Products

2.1 PERFORMANCE/DESIGN CRITERIA

- .1 Perform work in accordance with CSDMA, Recommended Specifications for Commercial Steel Doors and Frames, except as otherwise specified herein.

2.2 SYSTEM DESCRIPTION

- .1 Design Requirements:
 - .1 Design exterior frame assembly to accommodate to expansion and contraction when subjected to minimum and maximum surface temperature of -35 degrees C to 35 degrees C.
 - .2 Maximum deflection for exterior steel entrance screens under wind load of 1.2 kPa not to exceed 1/175th of span.

2.3 MATERIALS

- .1 Steel sheet: coated steel sheets to ASTM A924/M924; coating designation to ASTM A653/A653M: Commercial Steel (CS), Type B, ZF180 galvanized; stretcher levelled.
- .2 Reinforcement: to CSA G40.20/G40.21, Type 44W, coating designation to ASTM A653M, ZF75.

2.4 DOOR CORE MATERIALS

- .1 Stiffened: face sheets welded, insulated core.

- .1 Insulation: Polyurethane: to CAN/ULC-S704 rigid, modified polyisocyanurate, closed cell board. Density 32 kg/m³.

2.5 HARDWARE

- .1 Heavy duty commercial grade hardware to achieve the same function as existing.

2.6 ACCESSORIES

- .1 Metallic paste filler: to manufacturer's standard.
- .2 Adhesive: Polystyrene and polyurethane cores: heat resistant, epoxy resin based, low viscosity, contact cement.
- .3 Exterior top and bottom caps: rigid polyvinylchloride extrusion conforming to CGSB 41-GP-19Ma.
- .4 Door bottom seal, weatherstripping, and hardware: heavy duty commercial grade.
- .5 Fasteners: type 304 stainless steel screws with countersunk flat head.
- .6 Sealant: Section 07 92 00 – Joint Sealants.

2.7 FABRICATION - GENERAL

- .1 Welded construction: assemble units by welding in accordance with CSA W59 to produce a finished unit square, true, and free of distortion. Welding shall be continuous unless specified otherwise. Welding shall be undertaken only by a fabricator fully approved by the Canadian Welding Bureau to the requirements of CSA W47.1.
- .2 Permit access by an approved inspection and testing company for the purpose of inspecting at random, doors being fabricated for this project.
- .3 Fabricate galvanized steel channels to reinforce frames as required for size, and for fire protection rating requirements. Extend reinforcements from floor to structure above. Design top connection to accommodate structural deflection. Conceal reinforcements in frames.

2.8 FABRICATION - FRAMES

- .1 Fabricate frames in accordance with CSDMA specifications.
- .2 Supply frames to suit construction conditions and indicated dimensions.
- .3 Fabricate frames of ZF120 wipe zinc coat steel unless otherwise indicated.
- .4 Provide welded type pressed steel door frame and screens components in minimum thickness of 1.6 mm (16 gauge), thermally broken type construction.
- .5 Assemble components with accurately cut joints. Mitre outside corner joints of frames. Continuously weld joints on inside of profile and grind welds, flush and sand to smooth uniform surface; tabbed and spot-welded connections are not acceptable.
- .6 On factory-assembled frame product, provide two removable steel jamb spreaders welded to the base of the jambs or mullions to maintain alignment during shipping and handling. Remove spreaders prior to anchoring frames to floor.
- .7 Brace frame units to prevent distortion and protect finish during shipment.
- .8 Provide factory-applied touch up primer at areas where zinc coating has been removed during fabrication.

- .9 Insulate frame components with polyurethane insulation.
- .10 Conceal fastenings unless otherwise indicated.
- .11 Form Door stops integrally with frame and not added as a separate profile.
- .12 Anchor frames to floor by 1.6 mm (0.063") thick adjustable base clips, welded to frame and Provide with 2 holes for floor anchorage.
- .13 Hardware reinforcements shall be minimum thicknesses as specified herein, not including frame thickness. Provide reinforcement at hardware fastening points. Provide high frequency (angle type) reinforcement at hinges. Provide full height reinforcement of thicknesses at hinge side of frames with continuous hinges.

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 sand 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.

2.10 FRAME ANCHORAGE

- .1 Provide appropriate anchorage to floor and wall construction.
- .2 Where frames terminate at finished floor, supply floor plates for anchorage to slab. Check depth of extension of finished floor to structural slab and provide jamb extension anchorage as required. Provide 50 mm minimum adjustment
- .3 Locate wall anchors immediately above or below each hinge reinforcement on the hinge jamb, and directly opposite on the strike jamb. Provide three anchors per jamb for frames up to 2300 mm. Add one anchor per jamb for each additional 760 mm or fraction thereof in frame height.

2.11 DOOR FABRICATION GENERAL

- .1 Doors: swing type, flush, with provision for glass and/or louvre openings as indicated.
- .2 Exterior doors: hollow steel construction, insulated.

- .3 Fabricate doors with longitudinal edges welded. Seams: grind welded joints to a flat plane, fill with metallic paste filler and sand to a uniform smooth finish.
- .4 Blank, reinforce, drill doors and tap for mortised, templated hardware and electronic hardware.
- .5 Factory prepare holes 12.7 mm diameter and larger to except mounting and through-bolt holes, on site, at time of hardware installation.
- .6 Reinforce doors where required, for surface mounted hardware. Provide flush PVC top caps to exterior doors.
- .7 Provide factory-applied touch-up primer at areas where zinc coating has been removed during fabrication.
- .8 Manufacturer's nameplates on doors are not permitted.

2.12 HOLLOW STEEL CONSTRUCTION

- .1 Form face sheets for exterior doors from 1.6 mm sheet steel.
- .2 Reinforce doors with vertical stiffeners, securely welded to face sheets at 150 mm 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 from interior parts with continuous interlocking thermal break.
- .4 Apply insulation.

2.14 PRIMER

- .1 Touch-up primer: Commercial rust inhibitive primer, shop prime coat doors and frames before delivery; grey or red coloured primer; in accordance with Section 09 91 00 – Painting. Clear primer not acceptable; provide primer for field touch-up.

2.15 PAINT

- .1 Paint for exterior galvanized steel door and frame, apply:
 - .1 One coat Pitt-Guard DTR Epoxy Mastic (PPG Code 97-145 Series; 128 g/L VOC) @ 5 to 7 mils DFT. Two coats of Pitthane Ultra Gloss Acrylic Aliphatic Urethane (PPG Code 95-812 Series; 241 g/L VOC) @ 2.0 to 3.0 mils DFT per coat.
 - .2 One coat Amerlock 2 VOC (Code AK2-3; <100 g/L VOC) @ 7 mils DFT.
 - .3 One coat PSX 700 (Code PX7003; 84 g/L VOC) @ 7 mils DFT per coat.
- .2 Protect weatherstrips from paint. Provide final finish free of scratches or other blemishes.

Part 3 Execution

3.1 MANUFACTURER'S INSTRUCTIONS

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

3.2 EXAMINATION

- .1 Verify condition and dimensions of previously installed work upon which this Section depends. Report defects to Consultant. Commencement of work means acceptance of existing conditions

3.3 INSTALLATION GENERAL

- .1 Install frames to CSDMA Guide Specification for Installation and Storage of Hollow Metal Doors and Frames.

3.4 FRAME INSTALLATION

- .1 Set frames plumb, square, level and at correct elevation.
- .2 Secure anchorages and connections to adjacent construction.
- .3 Brace frames rigidly in position while building-in. Install temporary horizontal wood spreader at third points of door opening to maintain frame width. Provide vertical support at centre of head for openings over 1200 mm 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.

3.5 DOOR INSTALLATION

- .2 Install doors and hardware in accordance with hardware templates and manufacturer's instructions.
- .3 Provide even margins between doors and jambs and doors and finished floor and thresholds as follows.
 - .1 Hinge side: 1.0 mm.
 - .2 Latchside and head: 1.5 mm.
 - .3 Finished floor, and thresholds: 13 mm.
- .4 Adjust operable parts for correct function.
- .5 Install louvres and glazing.

3.6 FINISH REPAIRS

- .1 Touch-up areas where galvanized coating has been removed or damaged with primer.
- .2 Fill exposed frame anchors and surfaces with imperfections with metallic paste filler and sand to a uniform smooth finish.

3.7 CLEANING

- .1 Progress Cleaning: clean in accordance with Division 01 General Requirements. Leave Work area clean at end of each day.
- .2 Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment in accordance with Division 01 General Requirements. Perform cleaning after installation to remove construction and accumulated environmental dirt.
- .3 Manage and dispose of demolition and construction waste materials in accordance with Division 01 General Requirements.

3.8 PROTECTION

- .1 Protect installed products and components from damage during construction.
- .2 Repair damage to adjacent materials caused by Work of this Section.

END OF SECTION

Part 1 General

1.1 GENERAL REQUIREMENTS

- .1 Architectural Drawings covering the Work of this Section show design intent and profiles that are diagrammatic in nature. Drawings also show some general building standards for tying into adjacent building trades, which are to be completed and coordinated by this Section. In addition to Specification requirements, final design and performance of glazed aluminum framed systems and approval by authorities having jurisdiction is the responsibility of this Section.

1.2 SUMMARY

- .1 Capped glazed aluminum curtain wall framed windows with tubular aluminum sections with continuous thermal break material integral with nose of mullion complete with self-supporting and supplementary support framing, shop fabricated, and factory prefinished.
- .2 Provide labour, materials, products, equipment and services to design, supply and all install glazed aluminium framed assemblies in accordance with all project drawings and details.
- .3 Submit shop drawings, data and sample materials, fabricate, erect and warrant the glazed aluminum framed systems. This Trade Contractor shall be fully responsible for the structural integrity, weather tightness (air and watertight to the standards specified) of the glazed aluminum framed systems and envelope continuity to the surrounding elements.
- .4 The assembled system is to permit re-glazing of individual glass units without requiring removal of structural mullion sections.
- .5 The exterior glazed aluminum framed systems assemblies are to be designed to span the dimensions indicated, with differential movement at junctions to be accommodated with coupling horizontal mullions (stack joints).
- .6 The work of this Section shall include but not be limited to:
- .7 Prefinished exterior aluminum framed glazing assemblies incorporating insulating glass units, as indicated;
 - .1 Steel sheet air and vapour barriers and metal closures;
 - .2 Air and vapour barrier seals between work of this Section and adjacent construction;
 - .3 Insulation and air and vapour barriers associated with work of this Section, including areas behind glass spandrel panels;
 - .4 Sealants and caulking for work of this Section and between work of this Section and adjacent construction;
 - .5 All glass and glazing of wall assemblies including glass, gaskets, splines, setting blocks, weather stripping, sealants, and protective aluminum cover angle at exposed outside corners of glazing units;
 - .6 All reinforcing members, bracing, brackets, screws, bolts, etc. necessary for installation and to ensure glazed aluminum framed assemblies are in compliance with specified performance criteria; supply and installation of supplementary steel supports and anchors as required;

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- .7 Verification of building lines and levels as required for the proper layout and installation of all work included in this Section, including initial checking that embeds are in correct position prior to commencing work on site;
- .8 Shop applied anti-corrosive coating of all steel shapes and ferrous metal used in attachment or reinforcing of curtain wall and field painting after steel shapes are installed, except that galvanized steel need not be painted; touch-up galvanized steel shapes after installation;
- .9 This Section includes all work including air and vapour barrier connections, expanded foam at perimeter of frames, sealants and fasteners;
- .10 Coordinate work of this Section with installation of fire stopping, spray foam insulation, aluminum composite panel cladding, roofing and other related components or materials;

1.3 RELATED REQUIREMENTS

- .1 Section 07 27 13, Air and Vapour Barriers.
- .2 Section 07 92 00, Joint Sealing.
- .3 Section 08 80 50, Glazing.

1.4 REFERENCE STANDARDS

- .1 Building Regulations:
 - .1 Design of glazed aluminum framed systems shall comply with latest editions of all Government Codes and Regulations, Fire Regulations, National Building Code of Canada, Safety Regulations and any other regulations applicable to the installation, as a minimum standard.
- .2 Aluminum Association (AA):
 - .1 AA DAF45:2003 (R2009), Designation System for Aluminum Finishes.
- .3 American Architectural Manufacturers Association (AAMA):
 - .1 AAMA CW-DG1-96(2005), Aluminum Curtain Wall Design Guide Manual.
 - .2 AAMA CW-10-15, Care and Handling of Architectural Aluminum from Shop to Site.
 - .3 AAMA CW-11-85, Design Wind Loads for Buildings and Boundary Layer Wind Tunnel Testing.
 - .4 AAMA 501.1-17. Standard Test Method for Water Penetration using Dynamic pressure
 - .5 AAMA 501.2-15. Quality Assurance and Diagnostic Water Leakage Field Check of Installed Storefronts, Curtain Walls, and Sloped Glazing Systems.
 - .6 AAMA 501.5-07. Test Method for Thermal Cycling of Exterior Walls.
 - .7 AAMA 501-15, Methods of Test for Exterior Walls.
 - .8 AAMA 1503-09. Voluntary Test Method for Thermal Transmittance and Condensation Resistance of Windows, Doors and Glazed Wall Sections
 - .9 AAMA CW-13-85. Structural Sealant Glazing Systems.
- .4 American Society for Testing and Materials International, (ASTM):
 - .1 ASTM A36/A36M-14, Specification for Carbon Structural Steel.

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- .2 ASTM A123/A123M-15, Specification for Zinc (Hot Dip Galvanized) Coatings on Iron and Steel Products.
 - .3 ASTM A153/A153M-16a. Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware.
 - .4 ASTM A167-99(2009), Specification for Stainless and Heat Resisting Chromium Nickel Steel Plate, Sheet, and Strip.
 - .5 ASTM A653/A653M-15e1, Standard Specification for Steel Sheet, Zinc Coated (Galvanized) or Zinc-Iron Alloy Coated (Galvannealed) by the Hot Dip Process.
 - .6 ASTM A1008/A1008M-16, Standard Specification for Steel, Sheet, Cold-Rolled, Carbon, Structural, High-Strength Low-Alloy, High-Strength Low-Alloy with Improved Formability, Solution Hardened, and Bake Hardenable.
 - .7 ASTM A1011/A1011M-17a, Standard Specification for Steel, Sheet and Strip, Hot-Rolled, Carbon, Structural, High-Strength Low-Alloy, High-Strength Low-Alloy with Improved Formability, and Ultra-High Strength.
 - .8 ASTM B209-14, Specification for Aluminum and Aluminum-Alloy Sheet and Plate.
 - .9 ASTM B221-14, Specification for Aluminum Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes.
 - .10 ASTM C509-06(2015), Standard Specification for Elastomeric Cellular Preformed Gasket and Sealing Material.
 - .11 ASTM C661-15. - Standard Test Method for Indentation Hardness of Elastomeric Type Sealant by Means of a Durometer
 - .12 ASTM C1184-14, Standard Specification for Structural Silicone Sealants.
 - .13 ASTM D2240-15e, Standard Test Method for Rubber Property-Durometer Hardness.
 - .14 ASTM E283-19, Test Method for Determining the Rate of Air Leakage Through Exterior Windows, Curtain Walls, and Doors Under Specified Pressure Differences Across the Specimen.
 - .15 ASTM E330/E220M-14, Standard Test Method for Structural Performance of Exterior Windows, Doors, Skylights, and Curtain Walls, by Uniform Static Air Pressure Difference.
 - .16 ASTM E331-00(2016), Standard Test Method for Water Penetration of Exterior Windows, Skylights, Doors, and Curtain Walls, by Uniform Static Air Pressure Difference.
 - .17 ASTM E547, Standard Test Method for Water Penetration of Exterior Windows, Skylights, Doors, and Curtain Walls by Cyclic Static Air Pressure Difference
 - .18 ASTM E576-14, Standard Test Method for Frost/Dew Point of Sealed Insulating Glass Units in the Vertical Position.
 - .19 ASTM E783-02(2018) Standard Test Method for Field Measurement of Air Leakage Through Installed Exterior Windows and Doors
 - .20 ASTM E1300-16. Standard Practice for Determining Load Resistance of Glass in Buildings.
 - .5 Canadian General Standards Board (CGSB):
 - .1 CAN/CGSB 1.108-M89, Bituminous Solvent Type Paint
 - .2 CAN/CGSB 19.13-M87, Sealing Compound, One-Component, Elastomeric, Chemical Curing.

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- .3 CAN/CGSB-79.1-M91, Insect Screens.
- .6 Canadian Standards Association (CSA International):
 - .1 AAMA/WDMA/CSA 101/I.S.2/A440: North American Fenestration Standard / Specification for windows, doors, and skylights including the Canadian Supplement
 - .2 CSA-A440S1, Canadian Supplement to NAFS
 - .3 CSA-A440-00/A440.1-00, A440-00(R2005), Windows/Special Publication A440.1-00, User Selection Guide to CSA Standard A440-00, Windows
 - .4 CSA-A440.2/A440.3, Fenestration Energy Performance / User Guide to CSA A440.2
 - .5 CSA-G40.20/G40.21-13(R2018), General Requirements for Rolled or Welded Structural Quality Steel/Structural Quality Steels
 - .6 CAN/CSA-G164-18, Hot Dip Galvanizing of Irregularly Shaped Articles.
 - .7 CSA S16-16, Design of Steel Structures, Includes Update No. 1 (2016).
 - .8 CSA-S136-12, North American Specification for the Design of Cold-Formed Steel Structural Members.
 - .9 CSA-S157-05/S157.1-05 (R2015), Strength Design in Aluminum.
 - .10 CSA W47.1-09 (R2014), Certification of Companies for Fusion Welding of Steel.
 - .11 CSA W47.2-11 (R2015), Certification of Companies for Fusion Welding of Aluminum, Includes Update No. 1 (2011), Update No. 2 (2012).
 - .12 CSA-W59-13, Welded Aluminum Construction.
- .7 Environmental Choice Program (ECP):
 - .1 CCD-45-95, Sealants and Caulking Compounds.
 - .2 CCD-47-1998, Surface Coatings.
- .8 National Building Code of Canada (NBCC) 2020.
- .9 National Energy Code of Canada for Buildings (NECCB) 2020.
- .10 National Fenestration Rating Council (NFRC).
 - .1 NFRC Document 100, Procedure for Determining Fenestration Product U-factors
 - .2 NFRC Document 200, Procedure for Determining Fenestration Product Solar Heat Gain Coefficient and Visible Transmittance at Normal Incidence
 - .3 NFRC Document 400, Procedure for Determining Fenestration Product Air Leakage
 - .4 NFRC Document 500, Procedure for Determining Fenestration Product Condensation Resistance Values
- .11 Society for Protective Coatings (SSPC):
 - .1 SSPC - Paint 20 Zinc Rich Coating.
 - .2 SSPC - Paint 25 Alkyd, Zinc Oxide Linseed Oil and Primer for Use Over Hand Cleaned Steel Type 1 and Type 2.

1.5 DESIGN RESPONSIBILITY

- .1 The details shown on the drawings are included for the purpose of indicating the preferred profiles and dimensions necessary to achieve the design intent. Minor

dimensional adjustments to those shown may be made in the proposed design in the interest of fabrication or erection methods or techniques, provided that the design intent and the intent of the specifications are maintained. The design, engineering, procurement, fabrication and erection of the glazed aluminum framed assemblies, including the loads related to the direct attachment of the panel systems to the curtain wall assemblies as required to meet these performance specifications, shall be the complete responsibility of the Trade Contractor. The final reviewed shop drawings shall form part of the Contract Documents.

1.6 PERFORMANCE REQUIREMENTS

- .1 Design and size components to withstand dead and live loads caused by pressure and suction of wind, acting normal to the plane of the system.
- .2 Design and size components to withstand seismic loads and sway displacement as calculated in accordance with NBCC and other applicable codes. Coordinate and accommodate anticipated movements per structural design conditions.
- .3 Design glass per Section 08 80 50, Glazing.
- .4 Structural Test Performance: to ASTM E330, as follows:
 - .1 When tested at a positive and negative wind load design pressures, assemblies do not evidence deflection exceeding $L/175$ of clear span.
 - .2 A static design load of 40 psf (1916 Pa) shall be applied in the positive and negative direction.
 - .3 When tested at 150% of positive and negative wind-load design pressures, assemblies, including anchorage, do not evidence material failures, structural distress, and permanent deformation of main framing members exceeding 0.2% of clear span.
 - .4 Minimum test duration according to ASTM E330 is 10 seconds.
- .5 Design frames so that edges of inner pane of insulating glass units do not fall more than 8°C below the temperature of the center of the inner pane.
- .6 The design of the glazed aluminum framing, shall incorporate a thermal-break system so that no condensation shall form on any interior surfaces of the aluminum members before any of the exposed glass area of the sealed units reaches the dew point temperature when subjected to the specified environmental conditions. Thermally, the grid members shall have a resistance to heat transfer equal to or better than that of the area along the bottom of the sealed glass units with the selected spacer edge construction.
- .7 Anchorage shall be designed to accommodate all thermal, seismic and building movements. All anchorage and fastenings for curtain wall shall be concealed. Anchor shall be designed to accommodate construction tolerance of +/- 25 mm in all directions.
- .8 Elastic deflection limits for mullions: $L/175$ of the span vertically, under design loading for spans less than or equal to 4115mm; $L/240 + 6\text{mm}$ for spans greater than 4115mm.
- .9 Provide system to accommodate, without damage to components or deterioration of seals:
 - .1 Movement within system.
 - .2 Movement between system and perimeter framing components.
 - .3 Dynamic loading and release of loads.
 - .4 Deflection of structural support framing.
- .10 Design and provide aluminum elements in accordance with CAN3-S157.
- .11 Limit air infiltration to the following:

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- .1 Air infiltration and exfiltration for fixed vision and spandrel assemblies: 0.15 L/s·m² (0.00015 m³/s/m²) of wall area, measured at a reference differential pressure across assembly of 300 Pa as measured in accordance with AAMA 501 and ASTM E 283.
- .2 Air infiltration and exfiltration for operable glazed assemblies: 0.5 L/s·m² (0.0005 m³/s/m²) at 300Pa pressure differential when tested in accordance with ASTM E283.
- .12 Vapour seal with interior atmospheric pressure of 25 mm sp, 22C, 40% RH: No failure.
- .13 Water leakage: none, when measured in accordance with AAMA 501, ASTM E 331 and ASTM E 1105, with a reference differential pressure of 720 Pa and specified wind speed.
- .14 Thermal Transmittance (U-factor): Fixed glass and framing areas shall have U-factor of no greater than 0.35 with 1" (25.4) High Performance (HP) Glass as determined according to NFRC 100-2010.
- .15 The specified U-factor does not apply to operators.
- .16 Systems to provide for expansion and contraction within all system components caused by a cycling temperature range of 110 degrees C over a 12 hour period without causing detrimental effect to system components including buckling, glass breakage, failure of joint seals, undue stress on fasteners, noise or other detrimental effects.
- .17 Design glazed aluminum framed assemblies on the Rain Screen Principle. Drain water entering joints, condensation occurring in glazing channels, or migrating moisture occurring within system, to the exterior by a weep drainage network. Rain Screen Principle is to include provisions for pressure equalization and compartmentalization for all glazed aluminum framed elements and assemblies.
- .18 Maintain continuous air barrier and vapour retarder throughout assembly, primarily in line with inside pane of glass and heel bead of glazing compound. Position thermal insulation on exterior surface of air/vapour barrier (back pans).
- .19 Locate sealants, air/vapour seals, thermal breaks, thermal separations, drainage slots as show on the drawings and specified in this Section. All glazed aluminum framed assembly joinery is to be sealed with silicone adhesives/sealants
- .20 Movements of glazed aluminum framed assemblies due to design wind load, thermal and building movements shall be noiseless. Ensure no vibration harmonics, wind whistles, noises caused by thermal movement, thermal movement transmitted to other building elements, loosening, weakening, or fracturing of attachments or components of system occur.
- .21 All dissimilar metals shall be separated by an inert material to prevent any possibility of galvanic action.
- .22 Performance Designation: in accordance with AAMA/WDMA/CSA 101/I.S.2/A440-11 – NAFS:
 - .1 **AW-PG40-FW/AP**
 - .2 Designation Legend:
 - .1 AW – Performance Class
 - .2 PG – Performance Grade
 - .3 40 – Design Pressure
 - .4 FW – Fixed Window / AP – Awning Window

1.7 ADMINISTRATIVE REQUIREMENTS

- .1 Coordination:
 - .1 Coordinate and cooperate with cladding trades and air and vapour barrier and transition membrane trades by installing panel system closures and trims supplied by such trades.
 - .2 It is the responsibility of the Trade Contractor to verify on site and coordinate all dimensions and modules related to the work in a timely fashion to allow for any remedial work without affecting program.
- .2 Pre-Installation Meeting/Conference:
 - .1 Arrange pre-installation meeting/conference 2 weeks prior to commencing work of this Section with parties associated with this trade as designated in Contract Documents or as requested by Consultant. Presided over by General Contractor, include Consultant, Owner's Representative, Subcontractor performing work of this trade, testing company's representative and consultants of applicable discipline. Review Contract Documents for work included under this trade and determine complete understanding of requirements and responsibilities relative to work included, storage and handling of materials, materials to be used, installation of materials, testing, inspection and certification procedures, coordination with other work, sequence and quality control, project staffing, restrictions on areas of work and other matters affecting construction, to permit compliance with intent of work of this Section.
 - .2 Review installation methods, procedures, time schedule and conditions under which work shall proceed including manufacturers' written instructions and coordination required with related work.
 - .3 Review and finalize construction schedule, verify availability of materials, experienced installers, equipment and facilities needed to make progress and avoid delays.

1.8 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Product Data:
 - .1 Submit product data in accordance with Division 01 General Requirements.
 - .2 Submit manufacturer's instructions, printed product literature and data sheets for all curtain wall and window components, anchorage and fasteners, glass and infill, and internal drainage details and include product characteristics, performance criteria, physical size, finishes and limitations and water flow diagrams.
 - .3 Submit product data on structural silicone sealants to be used complete with preparation and installation recommendations.
 - .4 Submit test reports for insulating glass units as prescribed in CAN/CGSB 12.8 confirming performance criteria. Tests shall be conducted and reports prepared by an approved independent testing laboratory.
- .2 Shop Drawings:
 - .1 Submit shop drawings in accordance with Division 01 General Requirements.
 - .2 Shop drawings shall show all plans, elevations, sections and details. Show fabrication, assembly, installation and fixing anchorage, for all curtain wall,

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window types, and conditions. Indicate type, thickness and finish of materials, methods of anchorage, size of anchors, system dimensions, framed opening requirements and tolerances, adjacent construction, air/vapour barrier tie-ins, finishes, anticipated deflection under load, affected related work, weep drainage network, expansion and contraction joint location and details, separation of dissimilar materials and field welding required.

- .3 Glazing details applicable to replacement glass, with outline of procedure for glass replacement.
- .4 Include a complete layout of modular and referenced dimensions for all glazed aluminum assemblies, including identification of any deviations from the architectural layouts and drawings.
- .5 The Consultant's consideration of shop drawings shall not relieve the Contractor from their responsibility for errors or for supplying components and materials to the full satisfaction of the Consultant.
- .6 Sealants: Provide to sealant manufacturer, showing size of lites, design loads and sealant dimensions for evaluation and statement on stress.
- .7 Provide framing member structural and physical characteristics, calculations, dimensional limitations, special installation requirements.
- .3 Laboratory Test Reports:
 - .1 Submit certified test reports of the curtain wall and window framed assemblies confirming compliance with the PERFORMANCE REQUIREMENTS of the Specifications. Test reports shall be for the size and configuration of components to be supplied. Tests shall be conducted by an approved independent testing laboratory.
- .4 Design Data:
 - .1 Submit design data in accordance with Division 01 General Requirements.
 - .2 Provide framing member structural and physical characteristics, calculations, dimensional limitations, special installation requirements.
- .5 Samples:
 - .1 Submit samples in accordance with Division 01 General Requirements.
 - .2 Submit one (1) sample illustrating prefinished aluminum surfaces, specified glass units, and insulated spandrel units. Glazing materials to illustrate edges and corners. Alternative colours for spandrel glass may be requested.
- .6 Maintenance Data:
 - .1 Provide operation and maintenance data for glazed aluminum framed assemblies.

1.9 SOURCE QUALITY CONTROL

- .1 Manufacturer qualifications: company specializing in manufacturing the Products specified in this section with minimum five years documented experience.
- .2 Installer qualifications: company specializing in performing the work of this section with minimum five years documented experience and approved by manufacturer.
- .3 Perform welding Work in accordance with CSA W59.2.

1.10 DELIVERY, STORAGE, AND HANDLING

- .1 Deliver, store and handle materials in accordance with manufacturer's written instructions.
- .2 Delivery and acceptance requirements: deliver materials to site in original factory packaging, labelled with manufacturer's name and address.
- .3 Storage and handling requirements:
 - .1 Handle work of this section in accordance with AAMA CW-10.
 - .2 Store materials indoors, in dry location and in accordance with manufacturer's recommendations in clean, dry, well-ventilated area.
 - .3 Store and protect aluminum surfaces with wrapping. Do not use adhesive papers or sprayed coatings which bond when exposed to sunlight or weather.
 - .4 Protect prefinished aluminum surfaces with wrapping. Do not use adhesive papers or sprayed coatings which bond when exposed to sunlight or weather.
 - .5 Replace defective or damaged materials with new.

1.11 ENVIRONMENTAL REQUIREMENTS

- .1 Do not install sealants when ambient and surface temperature is less than 5 degrees C.
- .2 Maintain this minimum temperature during and after installation of sealants.

1.12 MOCK-UPS

- .1 Construct mock-ups in accordance with Division 01 General Requirements.
- .2 Provide one full window unit for inclusion in the brick masonry wall. Assemble to illustrate component assembly including glazing materials, weep drainage system, attachments, anchors, and perimeter sealant.
- .3 Locate where directed.
- .4 Allow 48 hours for inspection of mock-up by Consultant before proceeding with work.
- .5 When accepted, mock-up will demonstrate minimum standard for this work. Mock-up may remain as part of finished work if approved by Consultant.

1.13 FIELD QUALITY CONTROL

- .1 Have manufacturer of products supplied under this Section review work involved in handling, installation/application, protection and cleaning of its products, to verify compliance of Work with Contract.
- .2 Schedule site visits to review Work at stages listed:
 - .1 After delivery and storage of products, and when preparatory Work on which Work of this Section depends is complete, but before installation begins.
 - .2 Twice during progress of Work at 25% and 60% complete.
 - .3 Upon completion of Work, after cleaning is carried out.
 - .4 Obtain reports within three days of review and submit.

1.14 WASTE MANAGEMENT AND DISPOSAL

- .1 Remove from site and dispose of packaging materials at appropriate recycling facilities.

- .2 Collect and separate for disposal paper, plastic, polystyrene and corrugated cardboard packaging material for recycling.
- .3 Separate for reuse and recycling all steel, metal, glass and plastic waste.
- .4 Handle and dispose of hazardous materials in accordance with Regional and Municipal regulations.

1.15 EXTENDED WARRANTY

- .1 Provide a written warranty, signed and issued in the name of the Owner, stating that the total glazed aluminum framed assemblies are warranted against leakage, defects and malfunction under normal usage for a period of five (5) years from date of Certificate of Substantial Performance. Total system includes related caulking. Defective materials and workmanship include, but are not limited to: abnormal deterioration, aging and weathering of the work; leakage of water and air exceeding specified limits; structural failure of components resulting from forces and movements up to specified limits; condensation; deterioration, peeling and discoloration of finishes in excess of normal usage.
- .2 Glazing: per Section 08 80 50, Glazing.
- .3 Warranties shall include the prompt remedy of defects upon written notification from the Owner that defects exist. Remedy shall include labour, materials, equipment and services required to make good defective areas of the work and in the case of factory-fabricated components, to supply and install new components, all at no cost to the Owner and at times convenient to the Owner. Warranties shall also include making good other building parts and finishes and other Owner's property damaged or disturbed in the course of remedying defects.
- .4 Warrant all structural silicone sealant work against defects for a period of twenty (20) years. Warrant that the sealant shall remain free from cohesive or adhesive failure, surface crazing or discoloration.

Part 2 Products

2.1 ALUMINUM FRAMING AND COMPONENTS

- .1 Aluminum Components:
 - .1 Conform to requirements published in AA "Aluminum Standards and Data", referenced ASTM Standards and the following.
 - .2 Aluminum extrusions manufactured to dimensional tolerances to eliminate any edge projection or misalignment at joints. Unless otherwise specified, provide alloy and temper as required to suit performance requirements and finishes indicated. Provide concealed extruded bars, rods, shapes and tubes in alloys as recommended by fabricator to join or reinforce assembly of exposed aluminum components. Aluminum Association Design alloy AA6063T6, anodizing quality, free from perceptible distortions, waves, twists, buckling or other deficiencies of appearance or performance.
- .2 Alloys:
 - .1 Aluminum Extrusions and Sheet Aluminum: Shall be in accordance with most stringent of CAN3-S157 or ASTM B221 and ASTM B209, minimum 1/8" (3mm).

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- .2 Extruded Bars, Rods, Shapes and Tubes: Alloy 6063 and ASTM B221, 'Anodizing Quality'.
 - .3 Bars, Rods and Wire: ASTM B211
 - .4 Sand Castings: ASTM B26/B26M
 - .5 Permanent Mold Castings: ASTM B108/B108M.
 - .3 Aluminum sheet and plate: ASTM B 209M, suitable for purpose and finish required.
 - .4 Apply one coat of bituminous paint to concealed aluminum surfaces in contact with cementitious or dissimilar materials.
 - .5 Curtain Wall Framing:
 - .1 Profile: 2" (51mm) wide with depths as noted on drawings, nominal dimensions for vertical and horizontal back members and as required to carry required loads. Internal reinforcement of shaped steel structural sections where required for vertical spans and connections and support of aluminum composite panel cladding assembly systems.
 - .2 Shapes and Thickness: Provide shapes as shown and as required to suit performance requirements but with wall thickness of not less than following:
 - .1 Minimum Wall Thickness for Structural Extrusions: 1/8" (3mm).
 - .2 Minimum Wall Thickness for Non-Structural Extrusions: 1/16" (1.5mm).
 - .3 All exterior framing to be thermally broken with interior tubular section insulated from exterior pressure plate.
 - .4 Drainage holes, deflector plates and internal flashings to accommodate internal weep drainage system. Ensure curtain wall is provided with a positive slope to encourage water drainage out of the system to the exterior.
 - .5 Internal mullion baffles to eliminate "stack effect" air movement within internal spaces.
 - .6 Acceptable Manufacturers:
 - .1 TW2200 Series, by Alumicor.
 - .2 5400HTP Series, by Windspec.
 - .3 5200 Series, by Commdoor.
 - .4 1620UT Series, by Kawneer.
 - .5 Or approved alternate.
 - .6 Exterior connectors:
 - .1 Extruded aluminum snap-on cap trims secured to pressure plate with concealed fastening method.
 - .2 50mm (2") deep as indicated x width of back members.
 - .3 All open ends to have matching end closures, flush with end of cap.
 - .7 Flashings and Sills:
 - .1 Per Section 07 62 00.
 - .8 Exposed Aluminum Finishes:
 - .1 Colour and sheen shall be uniform with no visible variations.
 - .2 All exposed aluminum surfaces including curtain wall frames, window frames, flashings, trims, and panels shall be dark bronze anodized. Comply with

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Aluminum Association designation AA-M12 C22 A44, 0.7 mils (0.018mm) minimum coating thickness (Class I).

- .9 Carbon Steel:
 - .1 Structural Steel: CSA G40.20/G40.21, grade 350W. Mullion reinforcement shall be aluminum or stainless steel unless totally interior to air seal and vapour barrier where reinforcement shall be as a minimum, coated structural steel with galvanized paint.
 - .1 Structural Shapes, Plates and Bars: ASTM A36/A36M.
 - .2 Cold-Rolled Sheet and Strip: ASTM A1008/A1008M.
 - .3 Hot-Rolled Sheet and Strip: ASTM A1011/A1011M.
 - .2 Galvanizing: Galvanize after fabrication. Follow standard precautions to avoid embrittlement of the base metal by overpickling, overheating during galvanizing.
- .10 Fasteners:
 - .1 Exterior and Thru Air Seal Line: Type 304 Stainless Steel.
 - .2 Interior to Air Seal Line: Cadmium/Zinc plated or 400 series stainless steel or hot dip galvanized.
- .11 Embeds and Inserts:
 - .1 Interior of vapour barrier: hot-dip galvanized, cadmium plated, cast-iron, malleable-iron, or painted steel inserts complying with ASTM A123/A123M or ASTM A153/A153M requirements.
 - .2 Exterior of Vapour Barrier: Type 304 Stainless Steel.
 - .3 Curtain Wall Support Clips: Aluminum with Alodine finish.

2.2 SEALED INSULATING GLASS UNITS

- .1 Per Section 08 80 50, Glazing.

2.3 OPERATORS

- .1 Performance: to AAMA/WDMA/CSA 101/I.S.2/A440-11 – NAFS, in accordance with the performance requirements outlined in this specification, and as follows:
 - .1 Designation: CW-PG40-AP.
 - .2 Air tightness: A2.
 - .3 Condensation resistance: I-58-60.
 - .4 Thermal resistance: 0.48.
- .2 Projected: top hung opening out (THOO) awning and bottom hung opening in (BHOI) with removable double glazed insulating glass.
- .3 Acceptable materials:
 - .1 Alumicor Univent 1350.
 - .2 Windspec 535 Series.
 - .3 Commdoor 225 Series.
 - .4 Kawneer 526.
 - .5 Or approved alternate.
- .4 Hardware and screens:

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1. Hinges: Equip each window with 1 pair of stainless steel friction arms.
2. Operators:
 1. Awning: Equip each awning window with a crank operator, single lever type roto-operator.
 2. Locking: Equip each window with two claw locking handles with painted finish to match anodized aluminum frame finish.
 3. Screens: to CAN/CGSB-79.1.
 1. Type: Insect screening mesh: count 18x14, fibreglass.
 2. Fasteners: Stainless steel, tamper proof
 3. Screen frames: Aluminum colour to match window frames.

2.4 INSULATION

- .1 Foamed-In-Place Insulation:
 - .1 Low expansion, one component foam polyurethane, solvent free to CAN/ULC-S705.1; for use at shim spaces and voids.
 - .2 Acceptable materials:
 - .1 Enerfoam by Dow Chemical.
 - .2 Handi-foam by Fomo Products.
 - .3 CF 128-DW by Hilti.
 - .4 Or approved alternate.

2.5 MISCELLANEOUS COMPONENTS

- .1 Shims, Spacers, Anti-walk Blocks and Setting Blocks: 50 and 80 (Setting Blocks) Durometer Shore 'A' Hardness +/-5 respectively, heat cured silicone rubber. Resistance to sunlight, weathering, oxidization and permanent deformation under load and compatibility with all materials in the glazing system, including heel beads and secondary seals shall be the prime essentials of shims, spacers and setting blocks. Submit data confirming resistance to above items.
- .2 Exterior Glazing Gaskets: heat cured silicone compression gasket, of sufficient thickness to CGSB 10.13, Type 1. Gaskets shall have a 13.8 MPa (2000 psi) tensile strength to be under 30% compression minimum when installed. Gaskets shall have hardness Durometer A of 60 +/- 5, resistance to permanent set, 300% minimum elongation at break and resistant to ozone showing no cracks. Setting Blocks shall not damage or restrict glazing rabbet.
- .3 Dielectric Separator: Approved quick-drying, non-staining, alkali-resistant bituminous paint or epoxy resin solution or membrane - for cold application tack free once dry and able to withstand high temperatures.
- .4 Zinc Rich Primer/Paint: Galvafrid Grade SB zinc-rich coating by W.R. Meadows or approved alternate.
- .5 Cleaning Material: Xylol, Methyl-ethyl-ketone, Toluol or recommended by sealant manufacturer.
- .6 Sheet membrane air and vapour barriers: as per Section 07 27 13.
- .7 Compressible Filler/Backing Rod for Sealant: non-staining, round, resilient and nonabsorbent, non-gassing, bi-cellular, polyethylene foam, such as SOF ROD by Nomaco or Soft Type Baker Rod by ITP. Diameter shall be 25% greater than joint width

before installation. Compatible with sealant, primer and substrate.

- .8 Stack Joint Flashing: 22 ga. Type 300 series stainless steel embedded in silicone sealant and mechanically fastened, allowing specified movement or Dow 123 silicone membrane 3 mm thick with pre-sealed panel to panel joints.
- .9 Reinforcing Angles: Galvanized steel or aluminum angles of size, thickness and finish suitable for application.
- .10 Curtain Wall Polyethylene Protection Film: Provide on all horizontal and vertical mullions to minimum ceiling height. "Nitto" or approved alternate.

Part 3 Execution

3.1 EXAMINATION

- .1 Verify dimensions, tolerances, and methods of attachment with work of other Sections.
- .2 Verify conditions of substrates, wall openings and adjoining air barrier and vapour barrier materials, etc., installed under other Sections or Contracts are ready to receive Work of this Section. After lines and grades have been established and before beginning of installation in any area, the Trade Contractor shall examine substrates, adjoining construction and conditions under which Work is to be installed. Should any conditions be found which, in their opinion, will prevent the proper execution of their work, they shall report such conditions in writing to the Consultant. Installation work shall not proceed in that area until an agreement is reached on how the work will be adjusted to the satisfaction of the Consultant. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 FABRICATION

- .1 Fabricate system components with minimum clearances and shim spacing around perimeter of assembly, yet enabling installation and dynamic movement of perimeter seal.
- .2 Accurately machine cut and match frame together all joints, corners and mitres. Match components carefully to produce perfect continuity of line and design. Make joints toward the exterior weathertight and joints toward the interior airtight in accordance with specified allowances. Metal in contact shall have hairline joints. Location of exposed joints shall be subject to the approval of the Consultant.
- .3 Cope, notch and drill so as to provide minimum tolerance throughout system and to fit with hairline joints.
- .4 Provide for vertical expansion and contraction joints as necessary and install air cut-off in continuous vertical members to prevent stack effect of enclosed air columns.
- .5 Provide pressure equalizing and weep holes for enclosed air spaces at glazed assemblies including spaces behind glazed spandrels. Location of all joints and pressure equalizing drain vents shall be subject to Consultant's acceptance. Provide flexible, continuous gasket air/vapor barrier seals within framing assemblies, to attach between work of this Section and adjacent work, and elsewhere at locations shown and required. Seal joints.
- .6 Prepare components to receive anchor devices. Install anchors.
- .7 Arrange fasteners and attachments to ensure concealment from view.
- .8 Prepare system components to receive hardware.

ISSUED FOR TENDER

- .9 Reinforce framing members for external imposed loads.
- .10 Visible manufacturer's identification labels not permitted on finished work except where identification of safety glass is required by Code.
- .11 All aluminum surfaces to receive structural silicone sealant are to be prepared in strict accordance with the sealant manufacturer's instructions.

3.3 GLAZING

- .1 Use shims, spacers and setting blocks of proper size to support and hold glass in position independent of the glazing tape and gaskets. Place two setting blocks under each unit at the quarter points. Arrange setting blocks to avoid blocking water transfer to the inside of frames.
- .2 Install glazing tapes/gaskets for structural silicone application. Do not stretch tape or gasket. If using gasket, lift end gasket off the recess and apply 50mm long bead of sealant into the recess before pressing gasket down. Wipe off any excess sealant. Make joints only at corners of frame and seal all joints. Fit tape accurately with tight joints, free from tension, without gaps and cracks.
- .3 Set glass properly centered with uniform bite and face and edge clearances, free from twist or warp. Ensure bite is minimum 12mm.
- .4 Handle and install glass in accordance with manufacturer's directions. Prevent nicks, abrasion and other damage likely to develop stress on edges.
- .5 Cover and protect exposed outside corners of sealed glazing units with continuous light gauge aluminum angle, black.

3.4 INSTALLATION, CURTAIN WALL FRAMES AND OPERATORS

- .1 Install glazed aluminum framed assemblies in accordance with manufacturer's instructions, engineering requirements and CSA-A440/A440.1.
- .2 Attach to structure to permit sufficient adjustment to accommodate construction tolerances and other irregularities.
- .3 Provide all steel anchors, alignment attachments and shims to permanently fasten system to building structure. Clean weld surfaces; apply protective primer to field welds and adjacent surfaces.
- .4 Windows are to have continuous angle supports at head, jambs, and sills.
- .5 Align assemblies plumb and level, free of warp or twist. Maintain assembly dimensional tolerances and align with adjacent work.
- .6 Clean rabbets, stops and glass edges of dust, dirt, moisture, oil and other foreign matter detrimental to glazing material adhesion. Ensure drainage holes are not blocked.
- .7 Prior to insertion of gasket into adaptor race, apply silicone sealant.
- .8 Seal hairline joints at junctions of frame members. Metal to metal sealing to consist of gun applied silicone sealant. Gun-inject sealant ensuring a continuous seal of the joint. Ensure that bead in the glazing space does not impair seating of glazing materials. Remove excess sealant which is forced onto face of frame assembly.
- .9 Install sills, flashings and closures for complete installation. Ensure that sills, flashings and closures are provided with a positive slope to ensure water drainage to the exterior.

ISSUED FOR TENDER

- .10 Accurately size glass to fit openings allowing clearances following trade practices. Cut glass cleanly and carefully. Nicks, damaged edge conditions will not be accepted. Replace glass which has nicked or otherwise damaged edges.
- .11 Provide thermal isolation where components penetrate or disrupt building insulation.
- .12 Install and seal perimeter sheet air and vapour barrier materials to building air and vapour barrier as indicated, complete with termination sealant/mastic at all membrane terminations.
- .13 Install perimeter sealant to achieve performance criteria, including backing materials, and installation criteria.
- .14 Install foamed-in-place insulation inside and around all exterior glazed aluminum framed assemblies to maintain continuity of air seal and thermal barrier.

3.5 SITE TOLLERANCES

- .1 Maximum variation from plumb: 1/16" (1.5mm) / meter noncumulative or 1/2" (12mm) / 30 meters, whichever is less.
- .2 Maximum misalignment of two adjoining members abutting in plane: 5/16" (0.8mm).
- .3 Maximum sealant space between glazed aluminum framed assemblies and adjacent construction: 3/4" (19mm).

3.6 CLEANING

- .1 Ensure all excess sealants are removed. Remove excess sealant by moderate use of mineral spirits or other solvent acceptable to sealant manufacturer
- .2 Clean Work of this Section as recommended by finish applicator.
- .3 Clean glass on exterior and interior and remove markings indicating presence of glass.

3.7 PROTECTION

- .1 Protect finished Work from damage during construction.
- .2 Repair damage to adjacent materials caused by Work of this Section.

END OF SECTION

Part 1 General

1.1 RELATED SECTIONS

- .1 Section 07 92 00 – Joint Sealing
- .2 Section 08 44 13 – Glazed Aluminum Framing Systems

1.2 REFERENCES

- .1 Codes and standards referenced in this section refer to the latest thereof.
- .2 American National Standards Institute (ANSI).
 - .1 ANSI/ASTM E330, Test Method for Structural Performance of Exterior Windows, Doors, Skylights and Curtain Walls by Uniform Static Air Pressure Difference.
- .3 American Society for Testing and Materials (ASTM)
 - .1 ASTM D2240, Test Method for Rubber Property – Durometer Hardness.
 - .2 ASTM C920-11, Standard Specification for Elastomeric Joint Sealants.
- .4 Canadian General Standards Board (CGSB).
 - .1 CAN/CGSB-12.3, Clear Float Glass
 - .2 CAN/CGSB-12.8, Insulating Glass Units.
- .5 Canadian Standards Association (CSA).
 - .1 CSA A440.2, Energy Performance Evaluation of Windows and Sliding Glass Doors.
 - .2 CSA Certification Program for Windows and Doors.
- .6 Glass Association of North American (GANA)
 - .1 GANA Glazing Manual.
- .7 National Fenestration Rating Council (NFRC).
 - .1 NFRC Document 100, Procedure for Determining Fenestration Product U-factors
 - .2 NFRC Document 200, Procedure for Determining Fenestration Product Solar Heat Gain Coefficient and Visible Transmittance at Normal Incidence
 - .3 NFRC Document 300, Test Method for Determining the Solar Optical Properties of Glazing Materials and Systems
 - .4 NFRC Document 400, Procedure for Determining Fenestration Product Air Leakage
 - .5 NFRC Document 500, Procedure for Determining Fenestration Product Condensation Resistance Values

1.3 SYSTEM DESCRIPTION

- .1 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 Size glass to withstand wind loads, dead loads and positive and negative live loads as measured in accordance with ANSI/ASTM E330 and NBC latest edition.
 - .3 Limit glass deflection to 1/200 with full recovery of glazing materials.
 - .2 Design glass to applicable requirements of CAN/CGSB12.20 except where more stringent

requirements are specified. Design glass not to exceed a statistical probability of failure of 8 units per 1000 units representing a safety factor of 2.5.

- .3 Glass units shall withstand thermal stresses. Base thermal stress calculations on the use of blinds mounted on the inside face of glass units. Glass units shall also withstand thermal stresses created by shadowing of exterior components or assembly and elevated interstitial space temperatures. Glass thermal stress analysis to be provided as a formal submittal.
- .4 Glazed assemblies shall be capable of sustaining a minimum interior lateral load when considered as a guard. Provide safety glass as required.

1.4 SUBMITTALS

- .1 Product Data:
 - .1 Submit manufacturer's printed product literature, specifications and data sheet.
 - .2 Samples: Submit one 300mm x 300mm sample specified glass unit. Glazing materials to illustrate edges and corners.

1.5 QUALITY ASSURANCE

- .1 Perform work in accordance with GANA Glazing Manual and Laminated Glazing Reference Manual for glazing installation methods. Provide shop inspection and testing for glass.

1.6 MOCK-UPS

- .1 Construct mock-up to including glass glazing, and perimeter air barrier seal.
- .2 Mock-up will be used to judge workmanship, substrate preparation, operation of equipment and material application.
- .3 Construct mock-up where directed.
- .4 When accepted, mock-up will demonstrate minimum standard for this work. Mock-up may remain as part of finished work.
- .5 Allow 48 hours for inspection of mock-up by Architect before proceeding with work.

1.7 WARRANTY

- .1 Provide a separate written warranty stating that factory sealed double glazed insulating units, both vision and spandrel units, are warranted against leakage, malfunction and other defects, under normal usage for a period of ten (10) years from date of Certificate of Substantial Performance. Without restricting the generality of the warranty, defects to the insulating units shall include: warping of spacer bars by greater than 3mm; dust or film formation on internal glass surfaces; glass breakage except that caused by impact of solid objects; deterioration of glass coatings, including thermal properties.
- .2 Warranty shall include for replacement of any IGU's with internal dew point above -30 degrees Celsius when tested in accordance with ASTM E 576.

1.8 ENVIRONMENTAL REQUIREMENTS

- .1 Install glazing when ambient temperature is 10°C minimum. Maintain ventilated environment for 24 hours after application.
- .2 Maintain minimum ambient temperature before, during and 24 hours after installation of glazing compounds.

Part 2 Products

2.1 FLAT GLASS

1. Annealed glass, to CAN/CGSB-12.3, glazing quality, transparent, 6mm thickness.
2. Lo-E Coating:
 1. Low-emissivity (Low-e) coating, having the following properties based on an insulating glass unit with low-e coating on 2nd surface, argon gas fill, and transparent inner glass.
 - .1 Metallic coating: soft, sputtered.
 - .2 Light transmittance:
 - .1 Ultra-violet: 14%.
 - .2 Visible: 70%.
 - .3 Exterior reflectance:
 - .1 Visible light: 11%.
 - .4 U-Value (Imperial):
 - .1 Winter Night-time: ≤ 0.24 .
 - .2 Summer Day-time: ≤ 0.29 .
 - .5 Shading co-efficient: 0.43.
 - .6 Solar Heat Gain Coefficient: 0.39.
 - .7 Light to Solar Gain: 1.79.
 - .8 Basis-of-Design:
 - .1 PPG Solarban 60 (2) Clear + Clear, or similar with same or better physical properties and performance characteristics.
 - .2 Acceptable alternate manufacturers include: Cardinal, Guardian, Viracon, and Prelco.

2.2 SEALED INSULATING GLASS UNITS

1. VG1: Vision Glass:
 - .1 Double glazed insulating units to CAN/CGSB-12.8; sizes as noted on drawings, 25mm (1") overall thickness:
 - .2 6mm clear outer lite, annealed.
 - .3 Low "E" coating on #2 surface.
 - .4 Edge deletion of Low-E coating as required at thermal spacer.
 - .5 13mm high performance non-metallic thermal spacer.
 - .6 Inert gas filled cavity: Argon.
 - .7 6mm clear inner lite, annealed.

2.3 ACCESSORIES

1. Setting blocks: Neoprene, 80-90 Shore A durometer hardness to ASTM D2240, minimum 100 mm x width of glazing rabbet space minus 1.5 mm x height.
2. Spacer shims: Neoprene, 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.
3. 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 Glazing splines: resilient polyvinyl chloride, extruded shape to suit glazing channel retaining slot, colour as selected.
- .3 Glazing clips: manufacturer's standard type.
- .4 Sealant: Silicone Sealant; to ASTM C920: type S; grade NS; class 25; use NT, A, G, O, per Section 07 92 00, Joint Sealants.

2.4 FABRICATION

- 1. Verify glazing dimensions on Site.
- 2. Clearly label each glass light with maker's name, weight, quality, type and certification number. Do not remove labels until after work has been reviewed by Consultant.
- 3. Accurately size glass to fit openings allowing the clearances recommended by manufacturer.

Part 3 Execution

3.1 MANUFACTURER'S INSTRUCTIONS

- .1 Compliance: Comply with manufacturer's written data, including product technical bulletins, product catalogue installation instructions, product carton installation instructions, and data sheets.

3.2 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.

3.3 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.

3.4 INSTALLATION: EXTERIOR

- .1 Perform work in accordance with GANA Glazing Manual for glazing installation methods.
- .2 Cut glazing tape to length and set against permanent stops, 6 mm below sight line. Seal corners by butting tape and dabbing with sealant.
- .3 Apply heel bead of sealant along intersection of permanent stop with frame ensuring full perimeter seal between glass and frame to complete continuity of air and vapour seal.
- .4 Place setting blocks at 1/4 points, with edge block maximum 150 mm from corners.
- .5 Rest glazing on setting blocks and push against tape and heel of sealant with sufficient pressure to attain full contact at perimeter of light or glass unit.
- .6 Install removable stops with spacer strips inserted between glazing and applied stops 6 mm below sight line.

- .7 Fill gap between glazing and stop with sealant to depth equal to bite of frame on glazing, maximum 9 mm below sight line.
- .8 Apply cap head of sealant along void between stop and glazing, to uniform line, flush with sight line. Tool or wipe sealant surface smooth.

3.5 CLEANING

- .1 Perform cleaning after installation to remove construction and accumulated environmental dirt.
- .2 Remove traces of primer, caulking.
- .3 Remove glazing materials from finish surfaces.
- .4 Remove labels after work is complete.
- .5 Clean glass using approved non-abrasive cleaner in accordance with manufacturer's instructions.
- .6 Upon completion of installation, remove surplus materials, rubbish, tools and equipment barriers.

3.6 PROTECTION OF FINISHED WORK

- .1 After installation, mark light with an "X" by using removable plastic tape or paste.
- .2 Repair damage to adjacent materials caused by glazing installation.

END OF SECTION

Part 1 General

1.1 REFERENCES

- .1 American Architectural Manufacturer's Association (AAMA)
 - .1 AAMA 611-12, Voluntary Specification for Architectural Anodized Aluminum.
- .2 ASTM International (ASTM)
 - .1 ASTM D1784-11, Specification for Rigid Poly(Vinyl Chloride) (PVC) Compounds and Chlorinated Poly(Vinyl Chloride) (CPVC) Compounds.
 - .2 ASTM G21-09, Standard Practice for Determining Resistance of Synthetic Polymeric Materials to Fungi.
- .3 National Fire Protection Agency (NFPA)
 - .1 NFPA 70, National Electrical Code 2011 Edition.
 - .2 NFPA 701 (2010 Edition), Fire Tests for Flame-Resistant Textiles and Films.
- .4 Underwriters Laboratories Canada (ULC):
 - .1 CAN/ULC S109-03 Flame Tests of Flame Resistant Fabrics and Films

1.2 DESIGN CRITERIA

- .1 Meet DTIR – DC350 requirements:
 - .1 Provide crank operated roller blinds.
 - .2 Roller blinds are required at interior of all exterior windows.
 - .3 Low VOC emittance from fabric less than 5ppm.
 - .4 The following roller blinds manufacturers and products may be used.
 - .1 Silent Gliss.
 - .2 Sun Project Canada Inc. Shadecloth 3000 series.
 - .5 Wall mounted roller blinds are to be supported by wall structure. Drywall support is not acceptable.

1.3 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Submit product data in accordance with Section 01 33 00 – Submittal Procedures.
 - .1 Submit information for each type of product indicated including, but not limited to, the following:
 - .1 Styles, material descriptions, construction details, dimensions of individual components and profiles, features, and finishes.
 - .2 Operating instructions.
- .2 Submit shop drawings in accordance with Section 01 33 00 – Submittal Procedures.
 - .1 Indicate dimensions in relation to window jambs, operator details, head and sill anchorage details, hardware and accessories details.
 - .2 Wiring diagrams indicating power, system, and control wiring.

- .3 Submit samples in accordance with Section 01 33 00 – Submittal Procedures.
 - .1 Submit one representative working sample of each type of shading device.
 - .2 After approval, samples will be returned for incorporation into the Work.
- .4 Submit closeout data to Section 01 70 00 - Contract Closeout as follows:
 - .1 Methods for maintaining roller shades and finishes.
 - .2 Precautions about cleaning materials and methods that could be detrimental to fabrics, finishes, and performance.
 - .3 Operating hardware.

1.4 QUALITY ASSURANCE

- .1 Manufacturer Qualifications: Obtain roller shades through one source from a single manufacturer with a minimum of twenty years' experience in manufacturing products comparable to those specified in this section.
- .2 Installer Qualifications: Installer trained and certified by the manufacturer with a minimum of ten years' experience in installing products comparable to those specified in this section.
- .3 Regulatory Requirements:
 - .1 Flame Spread Rating: Provide panel materials with flame spread and smoke developed characteristics required by Authorities Having Jurisdiction as determined by testing identical products in accordance with CAN/ULC S109.
 - .2 Anti-Microbial Characteristics: 'No Growth' per ASTM G21 results for fungi ATCC9642, ATCC 9644, ATCC9645.

1.5 DELIVERY, STORAGE AND HANDLING

- .1 Deliver material to site in manufacturer standard packaging. Store and handle as recommended by manufacturer.

1.6 WARRANTY

- .1 Manufacturer Warranty: Provide manufacturer's warranty from commencing from date of Substantial Performance covering the following minimum requirements for materials:
 - .1 Shade Hardware: ten (10) years.
 - .2 Shade Fabric/Shade Cloth: ten (10) years.
 - .3 Metal Coatings: ten (10) years.

Part 2 Products

2.1 MANUFACTURERS

- .1 Acceptable Materials:
 - .1 Silent Gliss.
 - .2 Sun Project Canada Inc. Shadecloth 3000 series.

2.2 ROLLER SHADE COMPONENTS

- .1 Roller Tube: One piece extruded 6061-T6 or 6063-T6 aluminum roller tube(s) meeting the requirements of ASTM B429, having clear anodized finish as follows:
 - .1 Protective Finish: AA-M12 Mechanical Finish; C22 Non-Specular; A21 Chemical Finish, etched, medium matte anodic coating; clear coating 0.025 mm or thicker to AMA 611; roller tube assemblies having mill finish will not be acceptable.
 - .2 Tube Diameter and Thickness: Manufacturers recommended engineered diameter, wall thickness, and aluminum grade as required for maximum allowable deflection of L/700.
 - .3 Tube Configuration: Extrude tube with provision made for mechanical engagement with the operator and drive assembly; and having channels to accept fabric attachment spline.
- .2 Fabric Spline: Extruded vinyl profile, welded to fabric band or panel, allowing removal and re-installation of fabric bands or panels without removing the roller tube and hardware and having the following characteristics:
 - .1 Fabric bands or panels must be replaceable on site.
 - .2 Attachment of the fabric to the tube with double-sided adhesive tapes, adhesives, staples or rivets will not be acceptable.
- .3 Hem Bars and Hem Bar Pockets:
 - .1 Custom shaped oval, ergonomic aluminum profile; nominal 35 mm wide x 10 mm thick and having 1.8 mm wall thickness having matching end caps, pre-weighted to maintain bottom of shade fabric straight and flat; colour as selected by Consultant; with manufacturer's standard light seal applied to underside of hem bar; attached to fabric panel using welded fabric spline.
- .4 Fasteners: Non-corrosive fasteners as recommended by manufacturer.
- .5 Valance: As indicated by manufacturer's designation for style and colour.
- .6 Mounting: Inside mounting (confirm mounting with Consultant prior to ordering or fabrication), permitting easy removal and replacement without damaging roller shade or adjacent surfaces and finishes.
- .7 Hold-Down Brackets and Hooks or Pins and Side Channels: Manufacturer's standard for fixing shade in place, keeping shade panel material taut, and reducing light gaps when shades are closed.

2.3 SHADE MATERIALS

- .1 Roller fabric shall have the following characteristics:
 - .1 Low VOC emittance, less than 5 ppm;
 - .2 PVC coated fibreglass;
 - .3 Minimum weight 11.5 oz/yd;
 - .4 Minimum thickness 24 mil;

ISSUED FOR TENDER

- .5 Optimal Side "A" and Side "B" colouring (exterior facing to be lighter shade as selected by Consultant);
- .6 Flame retardant to NFPA-701;
- .7 Fabric shall have 5% openness.
- .8 Mermet T-Screen or Phifer, interior colour to match Sun Control SC 3608 as closely as possible.
- .2 Direction of Roll: Regular, from back of roller, and reverse, from front of roller, for double roller shades (confirm Direction with Consultant prior to ordering or fabrication).
- .3 Mounting Brackets: Fascia end caps, fabricated from steel finished to match fascia.
- .4 Fascia: L-shaped, formed-steel sheet or extruded aluminum; long edges returned or rolled; continuous panel concealing front and bottom of shade roller, brackets, and operating hardware and operators; length required; removable design for access.
- .5 Bottom Bar: Steel or extruded aluminum, with plastic or metal capped ends. Provide concealed, by pocket of shade material, internal-type bottom bar with concealed weight bar as required for smooth, properly balanced shade operation.
- .6 Shade Operation: Manual; with continuous loop bead chain, clutch, and cord tensioner and bracket lift operator.
 - .1 Position of Clutch Operator: Right side of roller, as determined by hand of user facing shade from inside, unless otherwise indicated on Drawings.
 - .2 Clutch: Capacity to lift size and weight of shade; sized to fit roller or provide adaptor.
 - .3 Lift Assist Mechanism: Manufacturer's standard spring assist for balancing roller shade weight and lifting heavy roller shades.
 - .4 Loop Length: Length required to make operation convenient from floor level.
 - .5 Bead Chain: Stainless steel.
 - .6 Cord Tensioner Mounting: Sill, or as otherwise directed by Consultant.
 - .7 Operating Function: Stop and hold shade at any position in ascending or descending travel.

2.4 OPERATORS

- .1 Manual Chain Operator:
 - .1 Mounting Brackets: Angle shaped brackets size and thickness to manufacturer's standard; unitized pre-moulded assembly; allowing for continuous front or back roll fascia across multiple shades without exposed fasteners.
 - .2 Chain Drive System: Continuous loop of #10 stainless steel bead chain having a rated strength of 40 kg to prevent chain breakage under normal operating conditions; and as limited by ANSI/WCMA A100.1 safety requirements, and as follows:
 - .1 Gear reduction chain operator with inertia braking mechanism capable of locking shade panel at any point of travel. Set travel length of chain operator assembly on-site without disassembly of hardware to suit travel length of shade panel.

ISSUED FOR TENDER

- .2 Chain drive operator shall positively engage drive mechanism through internal profile configuration; friction fitted engagement of the roller tube to drive mechanism will not be acceptable.
- .3 Chain operator shall prohibit operation by pulling on hem bar.
- .4 Shade roller tube shall be removable from brackets without hardware removal; non-metal components shall be self-lubricating.

2.5 ROLLER SHADE FABRICATION

- .1 Product Description: Roller shade consisting of a roller, a means of supporting the roller, a flexible sheet or band of material carried by the roller, a means of attaching the material to the roller, a bottom bar, and an operating mechanism that lifts and lowers the shade.
- .2 Concealed Components: Non-corrodible or corrosion-resistant-coated materials.
 - .1 Lifting Mechanism: With permanently lubricated moving parts.
- .3 Unit Sizes: Obtain units fabricated in sizes to fill window and other openings as follows, measured at 23° C:
 - .1 Shade Units Installed between Inside Jambs: Edge of shade not more than 6 mm from face of jamb. Length equal to head to sill dimension of opening in which each shade is installed.
- .4 Installation Brackets: Designed for easy removal and reinstallation of shade, for supporting fascia, roller, and operating hardware and for hardware position and shade mounting method indicated.
- .5 Installation Fasteners: Not fewer than two fasteners per bracket, fabricated from metal noncorrosive to shade hardware and adjoining construction; type designed for securing to supporting substrate; and supporting shades and accessories under conditions of normal use.
- .6 Colour-Coated Finish: For metal components exposed to view, apply manufacturer's standard baked finish complying with manufacturer's written instructions for surface preparation including pre-treatment, application, baking, and minimum dry film thickness.
- .7 Colours of Metal and Plastic Components Exposed to View: as selected by Consultant from manufacturer's standard line.
- .8 Hembars and Hembar Pockets:
 - .1 Ergonomic designed exposed extruded aluminum alloy 6063-T5, custom oval shaped profile 35 mm x 10 mm x 1.78 mm thick, with matching end caps, pre-weighted, to maintain bottom of shade fabric straight and flat. Colour prefinished to match adjacent window framing or as selected by Consultant. Underside of hem bar available with schlegel light seal. Attached to fabric panel by welded fabric spline.
- .9 Fasteners:
 - .1 Non-corrosive as recommended by manufacturer.

2.6 ACCESSORIES

- .1 Aluminum Fascia:
 - .1 Back / Regular Roll Shade Fascia:
 - .1 Extruded aluminum alloy 6063-T5, prefinished, 105 mm x 45 mm x 1.6 mm wall thickness, custom designed profile to fit onto premoulded end mounting brackets without exposed fasteners. Colour prefinished to match adjacent window framing or as selected by Consultant.
 - .2 Fascia shall allow for continuous placement across multiple shades (to a maximum length of 6100 mm without exposed fasteners.
 - .3 Fascia shall conceal the mounting hardware, power and control cables, drive mechanism, roller tube, and all fabric rolled on the tube.
 - .4 Fascia shall not fit snug against side channels to prevent thermal shock to the glazing system.
- .2 Closures:
 - .1 Room darkening side and bottom channel:
 - .1 Continuous extruded aluminum alloy, 6063-T5, U-shaped 51 mm x 22 mm x 1.5 mm thick with interior channels for 6 mm wide continuous schlegel light seals. Colour shall be prefinished to match the adjacent window framing or as selected by the Consultant.
 - .2 Custom manufactured for easy snap-on installation, allowing channel to snap into place without exposed fasteners; and to be removable without damage to the substrate.

2.7 FINISHES

- .1 Aluminum: clear anodized finish.
- .2 Unexposed aluminum: mill finish.

Part 3 Execution

3.1 EXAMINATION

- .1 Do not begin installation until substrates have been properly prepared.
- .2 If substrate preparation is the responsibility of another installer, notify Owner's Representative of unsatisfactory preparation before proceeding.

3.2 PREPARATION

- .1 Clean surfaces thoroughly prior to installation.
- .2 Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.

3.3 INSTALLATION

- .1 Install shades level, plumb, square, and true, according to manufacturer's written instructions, and located so shade band is no closer than 50 mm to interior face of glass. Allow proper clearances for window operation hardware.
- .2 Adjust and balance roller shades to operate smoothly, easily, safely, and free from binding or malfunction throughout entire operational range.
- .3 Clean roller shade surfaces after installation, according to manufacturer's written instructions.
- .4 Engage Installer to train Owner's maintenance personnel to adjust, operate, and maintain roller shade systems.

3.4 CLEANING

- .1 Progress Cleaning: clean in accordance with Section 01 74 11 - Cleaning. 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. Perform cleaning after installation to remove construction and accumulated environmental dirt.
- .3 Manage and dispose of demolition and construction waste materials in accordance with Section 01 74 21 - Construction Waste Management.

3.5 PROTECTION

- .1 Protect installed products and components from damage during construction.
- .2 Repair damage to adjacent materials caused by Work of this Section.

3.6 SCHEDULE

- .1 Blinds are required at all windows.

END OF SECTION



Halifax

Regional Centre for Education

FINAL
Asbestos
Management Program
HRCE Facilities

Prepared for:

**Halifax Regional Centre for
Education**

33 Spectacle Lake Drive
Dartmouth, Nova Scotia B3B 1W8

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Approved Abatement Contractors

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1.0 INTRODUCTION

Halifax Regional Centre for Education (HRCE) is committed to protect the health and safety of workers and occupants. This Asbestos Management Program (AMP) has been developed to meet responsibilities as an employer, and as a building owner to manage operational issues respecting asbestos and to maintain compliance with applicable regulations for disturbance of asbestos-containing materials (ACM) during demolition, renovation, alteration, maintenance, repair or other activities.

2.0 SCOPE

The AMP provides information and procedures for Asbestos Management of all HRCE owned or occupied facilities in Nova Scotia.

The AMP applies to all HRCE staff as well as all service providers and contractors performing work in HRCE facilities.

The AMP outlines requirements for HRCE personnel involved in acquisition of property which may contain ACM. It applies to all categories of property with the exception of vacant lands. If HRCE decides to lease property in the future ACM should be considered when developing their lease agreement and this AMP should be amended to address leased properties occupied by the HRCE.

The AMP is a management system to control the disturbance of ACM during demolition, renovation, alteration, maintenance, repair or other activities.

The AMP incorporates the following elements:

- Asbestos Assessments and Reassessments.
- Regulatory Requirements and HRCE Policies.
- Roles and Responsibilities.
- Notifications.
- Training Requirements.
- Emergency Reaction and Procedures.
- Record Keeping.
- Contractor Requirements.

3.0 OBJECTIVE

The AMP is a management system primarily intended to identify ACM and control disturbance of ACM by using proper procedures during demolition, renovation, alteration, maintenance, repair or other activities. The objective in preparing and instituting this AMP is to ensure that known or suspected ACM is managed



so that maintenance staff, construction workers and occupants are safeguarded in accordance with applicable regulations.

4.0 BACKGROUND INFORMATION AND HEALTH EFFECTS

The following is a very brief summary of the hazards and health effects from asbestos exposure:

- Occupational exposure to asbestos can cause fatal lung disease.
- Asbestos must become airborne and be inhaled to be hazardous. A physical disturbance or direct contact with ACM is required to cause it to become airborne. The mere presence of asbestos is not hazardous.
- Asbestos may remain in buildings so long as it is in good condition and undisturbed. No Provincial or Federal Regulations require the removal of ACM as long as it is enclosed, encapsulated or managed appropriately and removed prior to building demolition.

5.0 REGULATORY REQUIREMENTS AND HRCE POLICIES

5.1 Regulatory Requirements

This AMP was implemented in response to the following legislation in effect as of August 28, 2023.

All building operations, whether performed by HRCE, or service providers, shall adhere to the requirements outlined in this document and all applicable regulations, guidance documents and acceptable professional standards.

The following regulations and guidelines were in place at the time this AMP was prepared:

1. Occupational Health and Safety Act, N.S. Reg. 52/2013.
2. A Guide to Removal of Friable Asbestos-Containing Material.
3. A Guide to Assessment and Management of Asbestos in the Workplace.
4. Asbestos Waste Management Regulations, N.S. Reg. 53/95

6.0 HRCE POLICIES RELATED TO ASBESTOS

HRCE has established the following policies related to asbestos independent of applicable regulations:

- HRCE may opt for removal of ACM with minor damage as opposed to repair or encapsulation when cost-effective unless removal is not practicable. ACM with major damage must be removed.
- At existing leased properties where HRCE is a tenant, when ACM is discovered during any improvement, addition, renovation, demolition, maintenance, repair of any kind, or at



any other time, the Owner (Landlord) shall promptly remove the ACM from the leased premises, if possible within the existing lease agreement.

- HRCE may perform Low Risk asbestos operations, where appropriately trained to perform the work.
- All Moderate and High asbestos operations must be undertaken by an Asbestos Abatement Contractor. Asbestos Abatement Contractors may also perform Low Risk asbestos operations.

7.0 ASBESTOS-CONTAINING MATERIALS AT HRCE FACILITIES

Refer to the individual Asbestos Assessment or subsequent Asbestos Reassessment Reports prepared for the Facility, provided in Appendix G. In some cases, Hazardous Materials Assessment or Designated Substance Survey Reports have been prepared and these reports include information regarding asbestos and other hazardous materials (e.g. lead, mercury, silica, and PCBs).

All assessment reports or subsequent Asbestos Reassessment Reports have been, or will be, prepared to comply with applicable asbestos regulations and this AMP.

Asbestos Assessment Reports are key components of this AMP, as the reports define the locations of ACM and Presumed ACM (PACM) present in the facility, the condition of ACM, the friability, the type of asbestos and the approximate quantity.

7.1 Asbestos Assessments

Refer to the Asbestos Assessment or Hazardous Building Materials Assessment Report in Appendix G for further information on the methodology of the assessment(s) completed for the Facility.

HRCE will engage a Consultant to perform asbestos assessments for all facilities. The report is to be completed following a methodology compliant with applicable regulations and acceptable professional standards. The report must comment on the condition of the ACM, include recommendations for remedial action, and is to include the risk classification for any abatement required.

In facilities which are leased, copies of the initial asbestos assessment, and any subsequent reassessments, shall be provided by the Owner to HRCE, and maintained on Site, or HRCE will have an asbestos assessment report prepared and complete subsequent reassessments, limited to the leased space.

7.2 Reassessment of ACM

All ACM and PACM identified in the Facilities will be inspected at reasonable intervals, and at minimum annually, a reassessment of all ACM and PACM will be completed with written documentation.



The reassessment of ACM and PACM will be completed by a Consultant (Qualified Person) or HRCE staff, using the form provided in Appendix E.

7.2.1 Reassessment in Unassessed Areas

Where assessments have been completed in only a portion of schools, all non-sampled materials (including but not limited to ceiling tiles, vinyl floor tiles, vinyl sheet floor, etc.) are to be presumed to contain asbestos, and reassessed during their yearly inspection of the suites.

When feasible, arrangements should be made to access previously unassessed areas during the annual reassessments. If during any annual or other inspections, materials not previously sampled are found to be damaged (spalling finishes, debris, etc.), samples are to be collected and the material is to be identified as asbestos or non-asbestos. Remedial action and removal procedures are to be decided accordingly if the materials are found to contain asbestos.

7.3 Distribution of Assessment and Reassessment Reports

HRCE will ensure that each assessment and reassessment report is distributed or accessible to the following:

- HRCE JOHSC and/or Occupational Health and Safety Representative (OHS Representative).
- A hard copy will be sent to each facility. Electronic copies will be made available.
- Building Operators, Maintenance Personnel, Janitorial Staff.
- Project Managers or Construction Managers planning or performing work in a HRCE Building.
- Outside contractors that could potentially disturb ACM through their work.

8.0 PRE-CONSTRUCTION HAZARDOUS BUILDING MATERIALS ASSESSMENT

Prior to the commencement of any work that requires renovation, construction or demolition, the Facility or specific areas of the Facility to be impacted by the work shall be assessed for ACM, as well as other hazardous building materials (e.g. lead, mercury, silica, and PCBs), (the “**Pre-Construction Hazardous Building Materials Assessment**”).

The Pre-Construction Hazardous Building Materials Assessment must be performed by a Consultant and include destructive or intrusive testing of enclosed areas.

Sampling may include the following:



- Prior to disturbance of materials presumed to contain asbestos listed in the assessment reports, collect samples of materials that were not previously sampled/identified (refer to Asbestos Assessment Report or Hazardous Materials Report).
- Unidentified suspect materials that were not sampled during the initial survey, but which may be present located within enclosed areas such as pipe/duct insulations in ceiling spaces, chases or shafts. If such areas will be affected by the work, entry to these areas and sampling of suspect materials shall be performed.
- Assessment of existing visible floor, wall and ceiling finishes to assess and sample concealed finishes (e.g., vinyl flooring under carpet or other vinyl flooring, drywall over plaster, etc.)
- Other hazardous building materials shall be sampled and analyzed or identified prior to disturbance as required by provincial regulatory requirements. Other hazardous building materials may include lead, mercury, silica, polychlorinated biphenyls, mould, etc.

Upon receiving the Pre-Construction Hazardous Building Materials Assessment report, if asbestos and/or other hazardous building materials are present in the area, specifications (large scale projects) or a scope of work (small scale projects) for removal shall be prepared, provided, and reviewed by the Constructor or contractor prior to any renovation, construction, or demolition work.

HRCE will employ an Abatement Contractor to perform abatement of other hazardous materials and/or ACM that may be disturbed by construction, renovation, or demolition work using appropriate regulated procedures.

9.0 REMEDIAL WORK – DAMAGED MATERIALS

Where damage is observed, HRCE will refer to the existing Asbestos or Hazardous Building Materials Assessment or subsequent Asbestos Reassessment Reports (as required) to determine if the damaged materials are ACM or PACM.

Where damaged suspected asbestos-containing materials are not included in the existing Asbestos or Hazardous Building Materials Assessment Report(s), an assessment and/or sampling of these damaged materials must be conducted prior to repair of damage, unless materials are treated as ACM, and appropriate asbestos operations are followed.

If damaged materials contain asbestos and the regulated abatement procedure to be used is not detailed in the recommendations section of the existing Asbestos or Hazardous Building Assessment Materials report, HRCE will contact a Consultant to determine applicable asbestos abatement procedures and to develop a scope of work and performance specifications, as required.



HRCE will employ an Abatement Contractor to perform the remedial work required (removal of damaged ACM) and a Consultant to perform inspection and air monitoring as soon as practicable upon receiving the report/notice of damage.

10.0 NOTIFICATION

10.1 Notification to Occupants

HRCE will inform the JOSHC of any planned sampling, assessment or abatement work that is to be conducted within the applicable HRCE building(s) to ensure that all aspects of committee involvement are complied with.

Tenants must be notified of ACM in their leased space and in common areas of the building that they have access to and may disturb the ACM.

HRCE will notify all new tenants of the presence of ACM in the space they are occupying. Notification is to be completed prior to occupancy via the tenant lease agreement.

Upon institution of this AMP, and upon completion of asbestos assessments in a recently assessed or recently purchased property, where tenants have not been notified via their lease agreement, HRCE will notify occupants of the presence of asbestos in the space they are occupying.

10.2 Notification of Contractors

Contractors that perform work which may disturb ACM within the Facility must be notified of the presence of asbestos (by providing the Asbestos or Hazardous Building Materials Assessment Report). Notification will be sent to these parties prior to project or maintenance work (e.g. janitorial, telephone, cable, etc.).

Contractors are to inform all sub-trades of the presence of all ACM or PACM identified in the work area and include this information in their respective contract agreement.

If suspect ACM not identified in the contract agreement is discovered during the course of the work, the Contractors are to stop all work which might disturb the suspect ACM and notify the appropriate HRCE personnel (i.e. Property Manager and/or Project Manager as applicable) or Constructor, as the case may be.

Prior to performing work, contractors must complete and return the Contractors Notification Package (Appendix B) and HRCE will maintain acknowledgement forms from these packages.

10.3 Notification of Maintenance Personnel

HRCE will inform their own staff that will perform janitorial work, maintenance work or project work of the presence of asbestos in the Facility in which they are working. This will be completed by providing access



to the AMP and the most recent Asbestos Assessment or Hazardous Building Materials Assessment Report and training.

10.4 Notification of Project Managers, Architects and Engineers

HRCE will inform their project managers, architects and engineers of the presence of asbestos in the facility in which they are arranging for or planning work. This will be completed by providing access to the AMP, and the most recent Asbestos Assessment or Hazardous Building Materials Assessment Report.

10.5 Notification of Authorities Having Jurisdiction

Regulations in place at the time of this AMP development do not require notifications regarding asbestos-containing materials, except for:

- A major release of a hazardous substance (per Section 63 of the Occupational Health and Safety Act).

11.0 TRAINING REQUIREMENTS

HRCE will employ a Consultant to ensure staff have received appropriate training.

HRCE employees which will not undertake asbestos abatement work or will not disturb asbestos may be provided training including the following:

- Health effects of asbestos exposure.
- Overview of the existence of applicable regulations and risk classification.
- Identification of common types of ACM (so as to not disturb them).
- Understanding a typical asbestos survey report.
- Their responsibilities under the policies in this AMP and Regulations.

HRCE employees will undertake asbestos abatement work shall receive training including the following:

- Health effects of asbestos exposure.
- Applicable regulations and risk classification.
- Identification of common types of ACM.
- Asbestos Work Procedures limited to Low Risk Operations.
- Understanding a typical asbestos survey report.
- Their responsibilities under the policies in this AMP and Regulations.

HRCE will maintain a record of training of their employees.



HRCE requires all service providers, contractors, etc. to provide appropriate training to all workers who perform work in HRCE Facilities which will, or potentially may, disturb ACM.

12.0 RESPONSE TO DISTURBANCE OF ASBESTOS, PROCEDURES AND CONTACTS

HRCE staff and contractors may encounter fallen material that is suspected confirmed to contain asbestos or uncover a material that was previously unidentified and is suspected to contain asbestos. HRCE staff and contractors shall follow the protocol "Response to Disturbance of Asbestos" in Appendix C.

13.0 CLASSIFICATION OF ABATEMENT WORK

Refer to Appendix F for the classification of asbestos work.

14.0 INSPECTION AND AIR MONITORING OF ASBESTOS WORK

14.1 Visual Inspection

The primary method of ensuring compliance when conducting asbestos removal or abatement work is visual inspection of the site and work practices by a Competent Worker or Asbestos Consultant.

14.2 Air Monitoring During Asbestos Work

Per the "Asbestos in the Workplace: A Guide to the Removal of Friable Asbestos Containing Material" dated November 21, 2013:

- During the removal of friable asbestos-containing materials, where a Glove Bag is not used, and the air from the enclosure is exhausted inside the building, daily air sampling is required outside the enclosure.
- At the completion of removal of friable asbestos-containing materials, clearance air sampling must be performed prior to dismantling of the site isolation and engineering controls.

Air sampling above the regulatory requirements may be performed, as identified in the following sections.

Air monitoring and analysis during asbestos removal or abatement will be performed using Phase Contrast Microscopy (PCM) following the NIOSH 7400 method. PCM air samples must be submitted for analysis to a laboratory participating in a recognized quality control program such as the AIHA Asbestos Analysts Testing (AAT) Program or the Quality Control Program of the IRSST (the Institut de recherche Robert-Sauvé en santé et en sécurité du travail).

The PCM method does not characterize the types of fibres present. In cases where elevated fibre concentrations are identified, or the actual asbestos concentration is required, Transmission Electron Microscopy following the NIOSH 7402 method may be used.

The acceptable limit for PCM samples is as follows:

- as low as reasonably achievable (ALARA) outside the work area, and/or 0.01 fibres/cubic centimetre (f/cc).
- 0.01 f/cc for clearance air sampling.

Where TEM analysis is performed, the acceptable limits would be 0.01 asbestos fibres/cubic centimeter.

14.3 Low Risk – Inspection and Air Monitoring

14.3.1 Inspection

The Project Manager, an assigned Competent Worker, or an Abatement Consultant, will inspect the work upon completion of work to ensure all ACM has been removed and the area adequately cleaned of dust and debris.

14.3.2 Air Monitoring

Air monitoring is not required; however, projects may be evaluated on a case by case basis, and air sampling performed where desired.

14.4 Moderate Risk and Glove Bag – Inspection and Air Monitoring

14.4.1 Inspection

An Abatement Consultant will perform daily inspections throughout the abatement, and inspect the work upon completion of work to ensure all ACM has been removed and the area adequately cleaned of visible dust and debris. Upon completion of inspection and air monitoring (if required) by the Abatement Consultant, the site isolation may be dismantled.

The Project Manager or an assigned Competent Worker may inspect for final cleanliness after the site isolation has been dismantled.

14.4.2 Air Monitoring

PCM air monitoring will be conducted daily and at completion of abatement. Air monitoring will be conducted in occupied areas adjacent to the Asbestos Work Area or Glove Bag Work Area during contaminated work.



PCM air monitoring will be used for air clearance within the Asbestos Work Areas prior to re-occupancy. Where enclosures have been constructed to define the Asbestos Work Area, aggressive clearance air sampling will be performed.

14.5 High Risk – Inspection and Air Monitoring

14.5.1 Inspection

An Abatement Consultant will perform daily inspections throughout the abatement, and inspect the work upon completion of work to ensure all ACM has been removed and the area adequately cleaned of visible dust and debris. Upon completion of inspection and air monitoring by the Consultant, the site isolation may be dismantled.

The Project Manager or an assigned Competent Worker may inspect for final cleanliness after the site isolation has been dismantled.

14.5.2 Air Monitoring

PCM air monitoring will be conducted on a daily basis.

Air monitoring will be conducted at the perimeter of the Asbestos Work Area (in occupied areas adjacent to the Work Area) to ensure no leakage from the enclosure.

Aggressive clearance air monitoring must be performed within the Asbestos Work Areas. Where PCM samples fail to meet the 0.01 f/cc criteria:

- Contractors may be requested to reclean the Asbestos Work Areas, or;
- Transmission Electron Microscopy (TEM) may be used.

Once the clearance air testing is satisfactory:

- a. The site isolation and engineered controls may be removed.
- b. A copy of the air sample report is to be:
 - a. provided and maintained on site by the Contractor, when abatement work is part of a project;
 - b. provided to the Owner, and a copy is kept on file;
 - c. provided to the JOHSC or the OHS representative, if any, for the workplace and for the building



15.0 RECORD KEEPING AND DOCUMENTATION RETENTION

HRCE will keep the following records:

- Asbestos and / or Hazardous Building Materials Assessment Reports.
- Reassessment Reports.
- Tenant Notification Letters and dates posted or transmitted.
- Contractor Notification Packages and Acknowledgement Forms.
- Asbestos Project Work Records.
- Consultant Asbestos Abatement Completion Reports (including Daily Inspection and Air Monitoring Reports).
- Bulk sample analytical results from any sampling.
- Emergency response project records.

16.0 CONSULTANT QUALIFICATIONS

Consultants employed by HRCE for asbestos work are to meet the following minimum requirements:

- Display competency in asbestos and hazardous materials consulting
- Maintain a health and safety management system that meets provincial standards.
- Maintain a Comprehensive General Liability Policy, with a minimum of \$5,000,000 in coverage.
- Maintain an Errors and Omissions Policy, with a minimum of \$5,000,000.
- Maintain an Automobile or Fleet Policy, and Non-Owned Automobile Policy with a minimum of \$2,000,000 in coverage.
- Maintain valid provincial worker's compensation coverage
- Accredited to analyze PCM air samples or use an accredited laboratory.

17.0 ASBESTOS ABATEMENT CONTRACTOR QUALIFICATIONS

Contractors employed by HRCE are to meet the following minimum requirements:

- Maintain a Comprehensive General Liability Policy, provided on an "occurrence" basis, for a minimum of \$5,000,000 in coverage.
- Maintain an Asbestos Liability or Contractors Pollution Liability Policy, provided on an "occurrence" basis, with a minimum of \$5,000,000 in coverage.



- Maintain an Automobile or Fleet Policy, and Non-owned Automobile Policy with a minimum of \$2,000,000 in coverage.
- Maintain valid provincial worker's compensation coverage.
- All supervisors and workers performing abatement work are to be trained in the procedures being used, health effects of asbestos, applicable personal hygiene procedures, personal protection equipment used and respirator care.
- All workers are to be fit tested for respirators.
- Maintain a health and safety management system that meets provincial standards.

18.0 MAINTENANCE AND JANITORIAL WORK

HRCE personnel and contracted janitorial staff will not:

- Sweep/vacuum in areas of damaged ACM.
- Sweep/vacuum/remove ACM debris.
- Disturb ACM.
- Remove ACM.

HRCE will employ an Abatement Contractor to perform these tasks, where required.

Alternately, HRCE will employ the appropriately trained trade contractor if there is other work to be completed that will disturb ACM (e.g. installing electrical equipment through an asbestos-containing plaster wall).

19.0 MAINTENANCE OF THE AMP

This AMP is to be re-evaluated, and possibly revised, each time there is a substantial change to the any provincial regulation, or policy change. This AMP must be reviewed at least annually and updated as necessary.

20.0 ROLES AND RESPONSIBILITIES

This section defines the roles and responsibilities of HRCE personnel instituting this AMP and provide effective management of ACM at their facilities.

The AMP Facilitator has the primary responsibility to administer the AMP and ensure it is instituted and effective.

The following table summarizes the responsibilities of HRCE personnel:



Reference No.	Responsibility/Task	AMP Section Reference	AMP Facilitator	Facility Manager	Project Team	Client Staff	Consultant
1	Maintenance of the AMP	19.0	X				
2	Employ a Consultant to prepare Asbestos Assessment Reports for any facility where one is not available/prepared	7.1	X	X			
3	Employ a Consultant to prepare Asbestos Assessment Reports in newly purchased facilities	7.1	X	X			
4	Employ a Consultant to reassess facilities where ACM has been confirmed	7.2	X	X			
5	Distribute Asbestos Assessment and Reassessment Reports	7.3	X				
6	Upon receiving assessment and reassessment reports, employ a contractor to perform remedial abatement work to remove damaged ACM. Use applicable provincial procedures	9.0	X	X			
7	As required, prior to performing asbestos work, engage a Consultant to perform inspection and air monitoring	14.0	X	X	X		
8	Ensure that an intrusive pre-construction assessment for ACM is performed prior to any renovation, alteration or demolition	8.0		X	X		X
9	Conduct bulk sampling of suspect materials that have not been sampled or presume the materials to be an ACM	8.0		X	X		X
10	Employ a Consultant (as applicable) to prepare a scope of work prior to large scale abatement as part of construction, renovation or demolition.	9.0		X	X		
11	Provide existing occupants at the outset of this AMP, or occupants in newly purchased facilities, a letter notifying the lessee of ACM within their space, and instruction not to disturb the ACM.	10.1	X	X			



Reference No.	Responsibility/Task	AMP Section Reference	AMP Facilitator	Facility Manager	Project Team	Client Staff	Consultant
12	Ensure all Project Managers, Architects, Engineers and others arranging for, or planning, work in the Facility are provided with the most current asbestos (re)assessment report.	10.4	X	X	X	X	
13	Provide contractors working in HRCE facilities the most current asbestos information and notification via the Contractor Information Package	10.2		X	X	X	
14	Employ a Consultant to train HRCE personnel	11.0	X				
15	Response to an uncontrolled spill or disturbance of asbestos following emergency procedures in Appendix C	12.0	X	X	X	X	
16	Keep all records as required by this program (excepting contractor package acknowledgement)	15.0	X				
17	Keep records of contractor package acknowledgement for each project (contractors to submit via email and keep record)	15.0	X	X	X		
18	Ensure Consultants meet the required qualifications	16.0	X	X	X		
19	Ensure contractors meet the required qualifications	17.0		X	X		X
20	Ensure maintenance and janitorial work is performed so that it does not disturb ACM and unnecessary disturbance of ACM is avoided	18.0				X	
21	Report any unplanned disturbance to ACM or damage to ACM	12.0	X	X	X	X	

GLOSSARY

Amended Water	Water with wetting agent added for purpose of reducing surface tension to allow thorough wetting of ACM.
Asbestos-Containing Material(s) (ACM)	Material identified by an appropriate laboratory analytical method (e.g. EPA 600/R-93/116, NIOSH 9000, or NIOSH 9002) to contain at least 0.5% of any type of asbestos, and vermiculite that is identified to contain any amount of asbestos using EPA method 600/R-04/004 if other analytical methods do not identify the presence of asbestos.
Asbestos	Any and all types of asbestos (generally considered as Actinolite; Amosite; Anthophyllite; Chrysotile; Crocidolite; Tremolite, and Libby Amphibole).
Asbestos Work Area	Area where work is being performed which will or may disturb ACM including overspray and fallen material or settled dust that may contain asbestos.
Competent Worker	In relation to specific work, means a worker who, • qualified because of that person's knowledge, training and experience to do the assigned work in a manner that will ensure the health and safety of every person in the workplace; and • knowledgeable about the provisions of the Occupational Health and Safety Act and regulations that apply to the assigned work, and the potential or actual danger to health or safety associated with the assigned work.
Encapsulation	The application of a liquid sealant to asbestos-containing materials; the sealant may penetrate and harden the material (penetrants) or cover the surface with a protective coating (bridging sealants). Also called encasement. This is generally not advisable.
Enclosure	Enclosure of ACM means the construction of solid enclosure (walls, ceiling, bulkhead etc.) around ACM, or An Enclosure means the site isolation including hoarding walls, polyethylene sheeting and seals that isolates an Asbestos Work Area.
Friable Material	Material that: when dry, can be crumbled, pulverized or powdered by hand pressure, or is crumbled, pulverized or powdered. Includes previously non-friable asbestos-containing material that has become damaged to the extent that it may be crumbled, pulverized, or reduced to powder by hand pressure.
Glove Bag Removal	A method of removing friable insulation from a piping system using a prefabricated bag which isolates the section of insulation being removed.
HEPA Filter	High Efficiency Particulate Aerosol filter that is at least 99.97 percent efficient in collecting a 0.3 micrometre aerosol.
HEPA Filtered Negative Pressure Unit:	Portable air handling unit which extracts air directly from the Asbestos Work Area and discharges the air to the exterior of the building after passing through a HEPA filter.

JOHSC	Joint Occupational Health and Safety Committee.
Phase Contrast Microscopy (PCM)	A method which uses an optical microscope to determine airborne fibres, normally in an occupational setting. Results are presented as a number of fibres per cubic centimetre (f/cc). The method of analysis is based on the US National Institute for Occupational Safety and Health (NIOSH) Manual of Analytical Methods, Method 7400, issue 2, Asbestos and Other Fibres by PCM (August 15, 1994).
Transmission Electron Microscopy (TEM)	A method which uses an electron microscope to determine airborne asbestos fibres. Results are presented in fibres per cubic centimetre of air (f/cc). The method of analysis is The U.S. National Institute of Occupational Safety and Health (NIOSH) Manual of Analytical Methods, Method 7402, Issue 2: Asbestos by TEM (Aug 15, 1994).
Low, Moderate and High Procedures	Work classifications and procedures defined under provincial health and safety regulations.
US EPA	United States Environmental Protection Agency.

APPENDIX A

Letter of Notification to Tenants Regarding Asbestos in Premises



LETTER OF NOTIFICATION TO TENANTS REGARDING ASBESTOS IN PREMISES

The following wording should be utilized in communicating the presence of asbestos to a tenant or lessee.

To Occupant

This letter is being provided as notification of the presence of asbestos within the building at [building name and/or address]. HRCE has recently had an asbestos assessment performed of the entire building and has established a program to manage all asbestos in a safe and prudent fashion.

Our Consultant inspected all areas of the building and made recommendations, where necessary, for removal or repair of asbestos. All such work [has been completed/will be completed shortly] with appropriate inspection and supervision. All asbestos remaining is subject to the Asbestos Management Program (AMP) as required by Provincial Regulations and our own due diligence. A copy of the assessment report and the AMP are available for review at the [Office].

The continuing presence of the remaining asbestos does not pose a risk of exposure to occupants as long as it remains under this management program. Staff have been given appropriate training and are aware of its presence.

If you have any concerns, please contact the AMP Facilitator at [phone number].

APPENDIX B
Contractor Notification and Acknowledgement Form



CONTRACTOR NOTIFICATION AND ACKNOWLEDGEMENT FORM

HRCE has identified the presence of various asbestos-containing materials (ACM) within [HRCE Facility name] located at [address]. An asbestos inventory report showing the locations and amounts of these materials is available for viewing from the AMP Facilitator.

The disturbance of ACM is to be undertaken by Asbestos Abatement Contractors that maintain the appropriate insurance coverage and meet the requirements set out in the Asbestos Management Program (AMP).

The following activities may disturb asbestos materials. The AMP Facilitator must be notified of the following:

- Any removal, repair or disturbance of any ACM.
- Ceiling entry which may disturb sprayed-fireproofing or pipe insulation, or debris on the ceiling.
- Any other operation which may generate airborne asbestos from friable asbestos.
- The disturbance of any material excluded from the Facility's asbestos assessment report.
- Discovery of any material excluded from the survey.

Declaration by Contractor

The Contractor and their sub-contractors shall follow the work procedures as specified by HRCE's AMP and shall not disturb ACM without using proper procedures in accordance the provincial regulations and guidelines, and this AMP, including prior notification to the AMP Facilitator. All asbestos waste will be packaged, transported and disposed of in accordance with applicable regulations.

Notification of Asbestos Abatement

All Contractors who perform work at facilities where ACM is present must be notified of the presence of the ACM if their work may bring them into contact, or close proximity to, the ACM. This notification may include janitorial, security, telephone, computer cabling suppliers, mechanical maintenance contractors, etc.

All contractors who perform work, including telephone, computer cabling suppliers, electrical and mechanical contractors, etc., at HRCE facilities, where asbestos-containing spray-applied insulation is present above ceilings are to be notified that Moderate Risk Procedures may be required for any entry to, or work within the ceiling space, determined by condition of material, scope of work, and potential for disturbance of the material.



Contractors are to:

- Notify municipal Landfill site as per provincial regulations.
- Inform all sub trades of the presence of ACM identified in the contract documents.
- If suspect ACM not identified in the contract documents are discovered during the course of the work, the Contractors are to stop all work which might disturb the suspect ACM.
The contractor is to notify the Constructor (if applicable), HRCE and the JOHSC or OHS Representative for the workplace.

By signing below, the Contractor acknowledges they have received, read and understand the requirements of HRCE's AMP.

Building (Address): _____

Project: _____

Contractor: _____

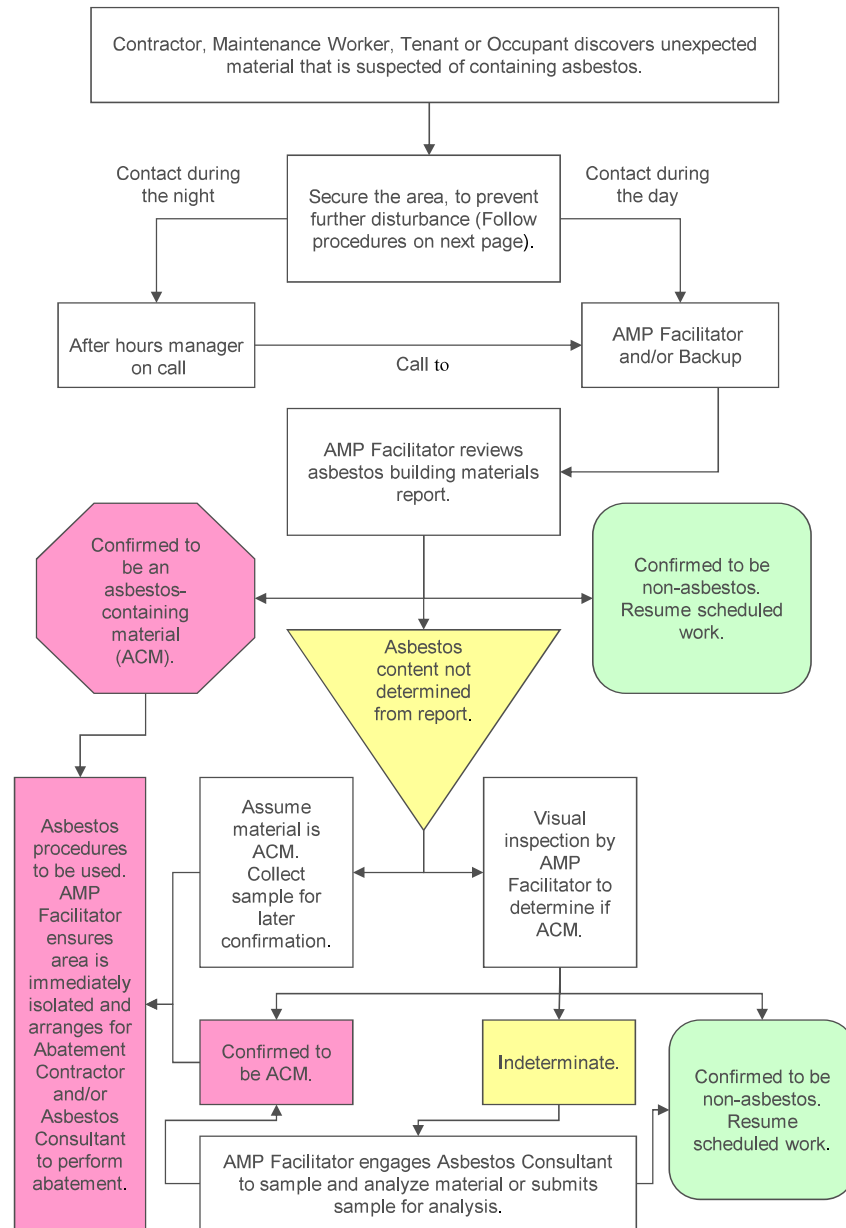
Name and Title: _____

Signature: _____

Date: _____

APPENDIX C
Response to Disturbance of Asbestos

EMERGENCY RESPONSES AND NOTIFICATION IN THE EVENT OF ASBESTOS-SUSPECT MATERIAL DISCOVERED DURING MAINTENANCE OR CONTRACTED WORK OR REPORTED BY OCCUPANT/TENANT



EMERGENCY REACTION IN THE EVENT OF SUSPECTED ASBESTOS SPILL

If asbestos-containing materials or suspect materials have been disturbed improperly, follow these directions:

- Do not clean up, cover, move or contact asbestos-containing or suspect material. Cease work in the area and do not resume work that risks disturbing the suspect material. Workers are to leave the area and the HRCE AMP Facilitator is to be notified immediately.
- Isolate the area by locking doors if this can be done without blocking emergency or fire routes.
- If it is not possible to safely isolate the area, the AMP Facilitator will notify appropriate persons not to enter the area. If possible, post security to prevent unnecessary access.
- The AMP Facilitator will arrange to shut down ventilation systems to the affected area including supply, return and exhaust.
- The AMP Facilitator will determine if asbestos is contained in the debris. If material cannot be confirmed asbestos-free by records or appearance, follow procedures below.
- The AMP Facilitator will contact an Asbestos Consultant to sample the material or identify the material visually.
- If the material is confirmed or assumed to contain asbestos, the AMP Facilitator is to contract an Asbestos Abatement Contractor to clean-up contaminated area.
- At their option, the AMP Facilitator may decide to employ an Asbestos Consultant to perform air monitoring and consulting, prior to, during, and/or after clean-up to determine airborne fibre concentrations prior to, and during, the work and to ensure airborne fibre levels are within acceptable limits to re-occupy the space. The AMP Facilitator must notify the Joint Occupational Health and Safety Committee of the results of air monitoring or testing.
- Enable ventilation systems after air monitoring or clean up of ACM.

APPENDIX D
Asbestos Project Work Record



ASBESTOS PROJECT WORK RECORD

Building: _____
(Building Address or Name)

Date: _____
(Today's Date)

Project Number: _____
(HRCE Project Number or Purchase Order Number)

Project Type:

- ☐ Emergency ☐ Planned Project
☐ Low Risk ☐ Moderate Risk ☐ Glove Bag ☐ High Risk

Area of Work: _____
(Room Name, Number, Floor etc.)

Description: _____
(Brief description of abatement, material, system, etc.)

Project Start Date: _____
(Mobilization date)

Project End Date: _____
(After dismantling/clean-up)

Contractor: _____
(Contracting firm or employee)

Telephone: _____
(Contractor or employee telephone)

Consultant: _____
(Name of consulting firm/contact if any)

Telephone: _____
(Consultant telephone)

Pre-Construction Assessment for asbestos-containing material (ACM) and other hazardous building materials (e.g. lead, mercury, silica, and PCBs) performed and report provided to Contractor?

☐ Yes ☐ No (Explain) _____

Air Sampling during abatement?

☐ Yes ☐ No



Clearance Air Monitoring performed after abatement?

☐ Yes ☐ No

Air Monitoring results to Joint Occupational Health and Safety Committee (if applicable)?

☐ Yes ☐ No

Asbestos Survey Updated to Reflect Changes in ACM Inventory?

☐ Yes ☐ No, no changes to ACM inventory resulted

☐ No, to forward copies to Consultant prior to next re-assessment

Asbestos waste removed from site and disposed of?

☐ Yes, ACM waste documentation attached ☐ No, ACM waste not generated

☐ No, ACM waste remains on site for later disposal

Append the following information relating to asbestos abatement to this work record, if applicable, and file Asbestos Work Record and attachments with Asbestos Management Program. Check where attached.

Submittals including Insurance ☐ Yes ☐ No

Waste Documentation ☐ Yes ☐ No

Specifications, Change Orders, Drawings ☐ Yes ☐ No

Consultant Inspection Reports ☐ Yes ☐ No

Air Monitoring Results ☐ Yes ☐ No

Analytical Certificates ☐ Yes ☐ No

Provincial Regulatory reports ☐ Yes ☐ No

Additional Correspondence ☐ Yes ☐ No

APPENDIX E
Reassessment of ACM



REASSESSMENT OF ACM

Upon completion of Reassessment, fill out the following form in its entirety and file with this facility's Asbestos Management Program and Assessment Report.

Use of this form is not necessary if an Asbestos Consultant has produced a detailed Reassessment Report which identified the damaged ACM identified in the building during the Reassessment (along with the associated locations, quantities, accessibility, and any required abatement recommendations).

Building: _____

Dates of Reassessment: _____

Name of person completing reassessment: _____

Signature of surveyor: _____

Others present: _____

Summary of Findings:

(If no deterioration was noted, indicate here): _____.

(Specifically indicate only areas requiring action in the table below).

(Attached photographs to this form as required).

Room or Location	Material	Comments Regarding Condition: Disturbed/Undisturbed (if other, explain)	Action Required

APPENDIX F
Classifications of Abatement Work

CLASSIFICATIONS OF ABATEMENT WORK

Nova Scotia regulations/guidelines do not specifically classify asbestos work procedures, and only prescribe removal of friable materials including the use of Glove Bags.

In the absence of defined work classifications, the following are the generally accepting work classifications:

Low Risk

- installation or removal of ACM ceiling tiles (less than 7.5 m²) without damage*.
- installation or removal of non-friable ACM, other than ceiling tiles, without damage*.
- damaging* non-friable ACM that is wetted and where the work is done using non-powered hand-held tools.

Moderate Risk

- removal of less than one square metre of drywall where ACM joint-filling compounds were used.
- enclosure of friable ACM.
- application of tape, a sealant or other covering to pipe or boiler insulation that is ACM.
- installing or removing ACM ceiling tiles that cover an area of 7.5 m² or more if the work is done without damaging the tiles.
- damaging non-friable ACM using non-powered hand-held tools if the material is not wetted.
- cleaning or removing filters used in air handling equipment in a building that has sprayed ACM insulation.
- glove bag removals of ACM insulation.
- Work that may expose a worker to asbestos and that is not classified as a Low Risk or High Risk operation, is also to be classified as a Moderate Risk operation.

High Risk

- removal or disturbance of friable ACM.
- the removal of all or part of a false ceiling to access a work area, if ACM is likely to be lying on the surface of the false ceiling.
- spray application of a sealant to friable ACM.



- cleaning or removal of air-handling equipment, including rigid ducting but not including filters, in a building that has sprayed ACM insulation.
- repair, alteration or demolition of a kiln or furnace made, in part, of refractory materials that are ACM.
- Use of power tools not attached to dust-collecting devices with HEPA filters on non-friable ACM.

* **damage** includes breakage, cutting, abrading, grinding, sanding, and vibration.

APPENDIX G
Site Specific Report(s)



Facility Specific Contacts				
Contact Name	Title	Address	Phone Number	Email Address

**ASBESTOS SURVEY,
Harrietsfield Elementary School
1150 Old Sambro Road
Harrietsfield, NS
B3V 1B1**

Prepared by:

Maritime Testing (1985) Limited
116-900 Windmill Rd
Dartmouth, N.S.

Prepared for:

Halifax Regional School Board
90 Alderney Dr., 3rd floor
Dartmouth, N.S.
B2Y 4S8

March 4, 1999

NEO-1256.65

INTRODUCTION

The Halifax Regional School Board has undertaken a mandate to conduct asbestos inventories in each of the schools in the School Board region. Maritime Testing (1985) Limited (MTL) was retained by the Board to conduct these inventories and prepare the asbestos survey reports. This report on Harrietsfield Elementary School represents one of the schools surveyed as part of this comprehensive inventory.

METHODS

Each school was inspected for building materials that might be composed of asbestos containing minerals (ACMs). Types of materials examined and sampled as needed could include but not necessarily be limited to:

mechanical systems:	insulation on pipes, fittings, boilers, air conveyance systems, structural materials
flooring:	sheet flooring, vinyl tiles
ceilings:	suspended ceilings, rigid ceilings, texture coats
walls:	texture coats, wallboards, plasters
building exterior:	wall panels, panels under entrances

Please note the following limitations regarding these surveys:

1. Sampling and inspection was not conducted if permanent visible damage would result from these activities. In such circumstances, inference is made to the potential for ACMs to be present based upon other observations made in the building (for example, holes are not cut into wall cavities to determine if insulated pipe work is present).
2. In each school, every room that was accessible was surveyed. In cases where access to a room was not possible, inference on that room is made based on what was observed throughout the rest of the school.
3. Plaster, unlike many other materials in schools such as floor tiles, ceiling tiles, etc., was originally fabricated on site. Each batch, which typically would be wheel barrow sized, could potentially be a bit different from the next. Asbestos, typically chrysotile, was used as well as other materials (hairs, wood) as a strengthening material and was applied "in shovelfuls" more or less at the discretion of the worker. Samples collected routinely in schools are based upon perceived differences in

texture, age of construction, etc., and may not reflect small differences from one batch to another, particularly since sample sizes are kept small to reduce damage. Accordingly, samples of plaster identified as not containing asbestos may well not be precisely indicative of the overall composition of the plaster in general. As a result, plaster should be assumed to contain asbestos unless a specific sample from the area in question has been analysed and shown to be asbestos free.

All inspections were scheduled such that sampling could be conducted after normal school hours. This school was surveyed on February 2, 1999.

Samples collected at the school were examined under both stereo and polarised light microscopy to determine fibre types and relative percentages of each asbestos mineral if it was present. As well, any ACMs were further categorised into one of three categories as noted below:

- Priority 1: materials representing a potential health risk with normal routine building use and which require immediate removal. Such materials may include damaged ceiling tiles, damaged pipe insulation, damaged friable boiler insulation.
- Priority 2: materials which do not pose a health risk under normal school usage but which pose a periodic risk to maintenance and custodial staff or which are currently undamaged but which might easily be damaged in the future; these materials require removal during the next suitable time (ie a major school break, next planned renovation project). Such materials may include undamaged ceiling tiles, damaged pipe insulation above ceilings, undamaged texture coats.
- Priority 3: Non-friable materials or materials that are in good condition, are not generally accessible, and which currently pose no risk to any occupant. Such materials may include floor tiles, transite panels, mechanical insulation in good repair.

Refer to Appendix A for a summary of the Priorities of the ACMs.

Data are also available on an asbestos inventory data base, accessible from the school board offices prepared specifically by MTL for this project.

For a list of materials sampled, refer to Appendix B. Refer to Appendix C for a diagram of the school floor plan and sample locations. For a list of locations and quantities of asbestos containing materials, refer to Appendix D. Refer to Appendix E for a room by room account of ACM's. Refer to Appendix F for photos of Priority 1 ACMs.

INVENTORY RESULTS.

This building was constructed in 1975.

Boiler Room: The boiler is encased in steel with no access to the insulation underneath. None of the other materials in the boiler room contain asbestos.

Exterior: No materials on the exterior contain asbestos.

Floors: None of the floor materials contain asbestos.

Walls: None of the wall materials contain asbestos.

Ceilings: None of the ceiling materials in this school contain asbestos.

Pipe Systems: None of the pipe materials contain asbestos.

Appendix A:

Summary: The following is a summary of Priorities of the various ACMs at this school:

Priority 1: • none

Priority 2: • none

Priority 3: • none

Appendix B:

<u>Samples taken and locations</u>			
<u>#</u>	<u>Sample description</u>	<u>Location</u>	<u>ACM</u>
<u>Boiler Room</u>			
65.10	insulation on pipe elbow	boiler room	no
65.11	insulation on pipe elbow	boiler room	no
<u>Exterior</u>			
	No samples taken		
<u>Floors</u>			
65.1	12" tile, light brown with brown and white streaks	Gymnasium	no
65.2	12" tile, beige with brown streaks	Gymnasium	no
65.5	12" tile, coffee brown with white streaks	Room 108	no
65.8	12" tile, khaki green with white streaks	Principal's office	no
65.9	12" tile, black	Room 101	no
65.12	12" tile, light beige with brown streaks	Library	no
65.13	12" tile, reddish brown with white streaks	Room 101	no
65.14	12" tile, white/beige marble	North corridor (lower level)	no
65.15	12" tile, white	North corridor (lower level)	no
65.16	12" tile, off-white with reddish brown streaks	North corridor (lower level)	no
65.17	12" tile, yellow with white streaks	Staff lounge	no
65.18	12" tile, light beige with grey streaks	Staff lounge	no
65.19	12" tile, brown with dark brown and white streaks	Room 207	no
65.20	12" tile, pink/ white marble	Room 207	no
65.21	12" tile, blue marble	Storage room #5	no
65.22	12" tile, light grey	Portable	no

Appendix B:

<u>Samples taken and locations</u>			
<u>#</u>	<u>Sample description</u>	<u>Location</u>	<u>ACM</u>
<u>Ceilings</u>			
65.3	2'x2' suspended tile	Gymnasium storage	no
65.6	2'x4' suspended tile	Boys washroom (lower level)	no
65.7	2'x2' suspended tile	Girls washroom (lower level)	no
<u>Pipes</u>			
65.4	insulation on pipe elbow	gymnasium storage room	no

Appendix D:

Quantity and locations of ACMs.

Boiler Room
No ACM's

Exterior
No ACM's

Floors
No ACM's

Walls
No ACM's

Ceilings
No ACM's

Pipes
No ACM's

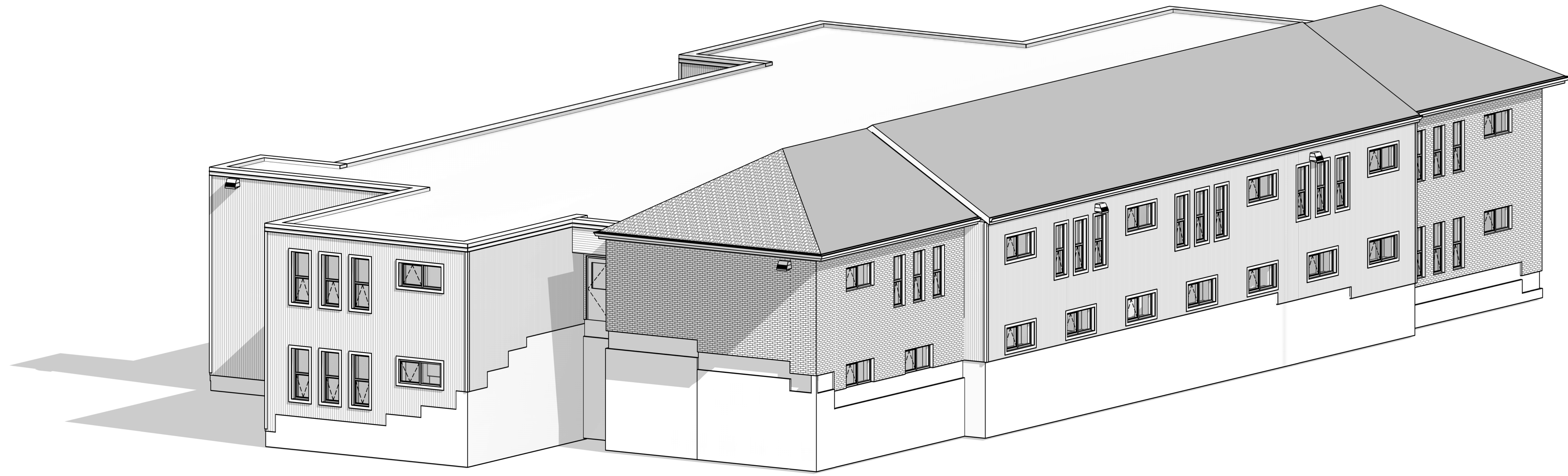
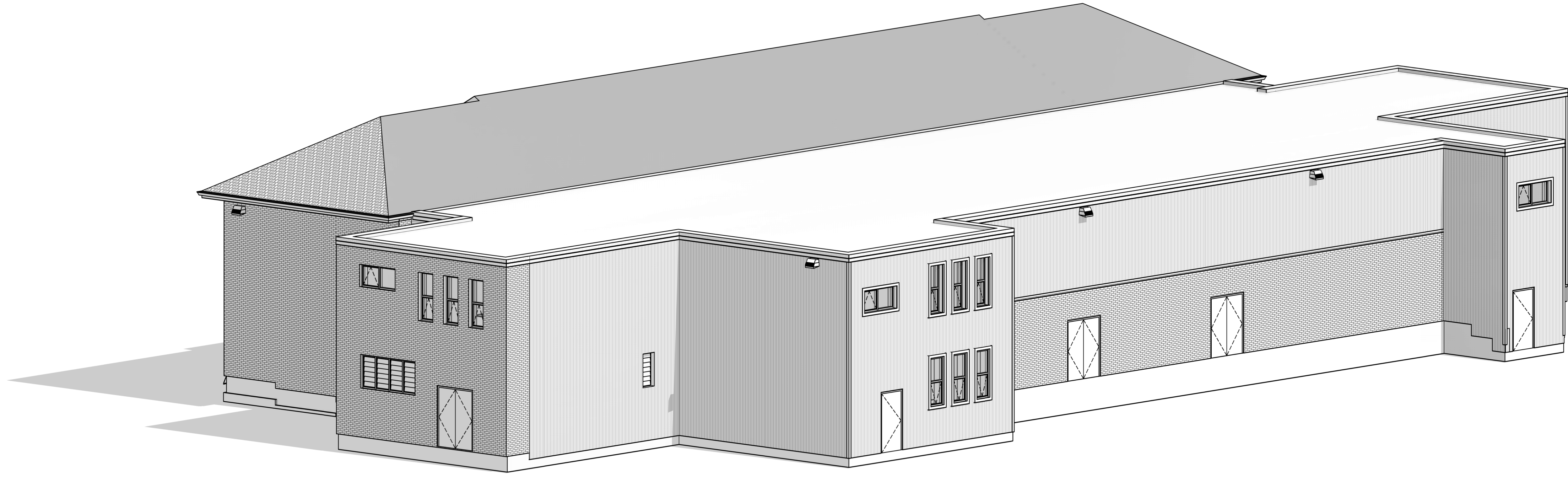
Miscellaneous
No ACM's

Appendix E:

ACM's Room by Room (for quantities refer to Appendix D).

No ACM's

Appendix F: There are no Priority 1's in this school.



- DRAWING LIST**
- ARCHITECTURAL**
- A-101 PHASING
 - A-102 FLOOR PLANS
 - A-201 BUILDING ELEVATIONS, DOOR & WINDOW SCHEDULES
 - A-351 WALL SECTIONS
 - A-352 WALL SECTIONS
 - A-501 SECTION DETAILS
 - A-502 SECTION DETAILS
 - A-503 SECTION DETAILS
 - A-504 SECTION DETAILS
 - A-551 PLAN DETAILS
 - A-552 MISCELLANEOUS AND PLAN DETAILS

FBM

101-6560 Currier St.
Halifax, Nova Scotia
Canada B3K 1C4

architects@fbm.ca
902-429-4100
fbm.ca

Harrietsfield School - Envelope Renewal

1150 Old Sambro Rd., Harrietsfield, NS

ISSUED FOR TENDER

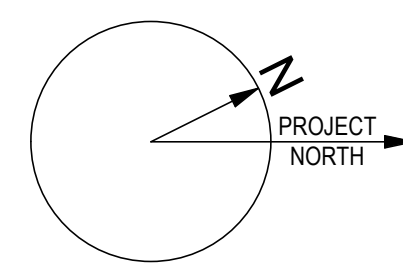
PROJECT NAME:

CLIENT:



Halifax
Regional Centre for Education

FBM PROJECT NO.: 2025-101 | DATE: 11 SEP 2025



GENERAL NOTES

- EXTERIOR ELEVATIONS SHOW NEW CLADDING AND NEW WINDOWDOORS, AND RELATED NEW CONDITIONS. THE EXISTING CLADDING, AT ALL BUILDING FACADES, IS BRICK VENEER. ALL EXISTING WINDOWS ARE ALUMINUM.
- CONTRACTOR TO MAKE GOOD ALL EXISTING SURFACES AND FINISHES AFFECTED BY THE WINDOW AND EXTERIOR WALL WORK AS DETAILED AND/OR IMPLIED BY THE DRAWINGS.
- WHERE NECESSARY TO REPAIR TO MATCH ADJACENT MATERIALS AND FINISHES, EXTEND PATCH TO NEAREST NATURAL BREAK POINT i.e. INSIDE CORNER, EXIST. JOINT OR LOCATION APPROVED BY THE ARCHITECT.
- CONTRACTOR TO PROTECT AND MAINTAIN THE INTEGRITY OF EXISTING FINISHES IN ALL AREAS NOT SCHEDULED FOR DEMOLITION WORK. ANY DAMAGE DUE TO DEMOLITION AND/OR NEW CONSTRUCTION TO BE REPAIRED AND MADE GOOD.
- DO NOT ALLOW ANY ADHESIVE DOORS AND OTHER FUMES FROM CONSTRUCTION ACTIVITIES TO ENTER MECHANICAL SYSTEMS.
- CONTRACTOR TO REMOVE AND LAWFULLY DISPOSE OFF SITE ALL RUBBISH AND DEBRIS RESULTING FROM CONSTRUCTION. KEEP PROJECT AREA BROOM CLEAN. WHENEVER APPLICABLE, ALL DEMOLITION AND CONSTRUCTION DEBRIS TO BE SORTED AND TAKEN TO APPROPRIATE FACILITIES FOR RECYCLING.
- CONTRACTOR TO REPAIR AND MAKE GOOD ALL EXISTING FLOORS, WALLS, AND CEILINGS THAT ARE TO REMAIN AFTER DEMOLITION AND PREPARE SURFACES TO RECEIVE NEW FINISHES.
- ALLOW FOR PROPER VENTILATION OF THE PREMISES DURING THE WORK.
- REPORT ANY HAZARDOUS MATERIALS FOUND ON SITE TO HRCE PROJECT MANAGER.
- GREY SHADED COMPONENTS ARE NOT PART OF THE WORK OF THIS CONTRACT.
- VERIFY ALL DIMENSIONS ON SITE PRIOR TO PROCEEDING WITH WORK. NOTIFY HRCE OF ANY DISCREPANCIES BETWEEN AS FOUND CONDITIONS AND THE CONTRACT DOCUMENTS IMMEDIATELY UPON DISCOVERY OF SUCH CONDITIONS.

DEMOLITION NOTES

- REMOVE EXTERIOR BRICK VENEER, INCLUDING MASONRY TIES, INSULATION, FLASHINGS, SEALANTS, ETC.
- REMOVE EXISTING WINDOWS AND SECURITY SCREENS. REMOVE GYM DOORS. REMOVE ASSOCIATED TRIMS, CLIPS, FLASHINGS, SEALANTS, FASTENERS, ETC.
- REMOVE ALL EXISTING STEEL SHELF ANGLES AND LOOSE LINTELS.
- REFER TO 'EXISTING' WALL SECTIONS, SECTION DETAILS, AND PLAN DETAILS.

PRICING

SUBMIT SEPARATE LUMP SUM PRICES FOR EACH PHASE INDICATED, PER 00 41 13, PRICE SUBMISSION FORM.

THE EXPECTATION IS THAT ALL EXISTING WINDOWS WILL BE REPLACED AT EACH PHASE THEY OCCUR. HOWEVER, HRCE MAY OPT TO NOT REPLACE THE WINDOWS. TO ACCOUNT FOR THIS IN THE BID SUBMISSION, A CREDIT AMOUNT RELATED TO RETAINING THE WINDOWS, PER PHASE, IS REQUIRED TO BE SUBMITTED (PER 00 43 13).

REFER TO SECTION AND PLAN DETAIL SHEETS FOR EXISTING AND NEW WINDOW CONDITIONS.

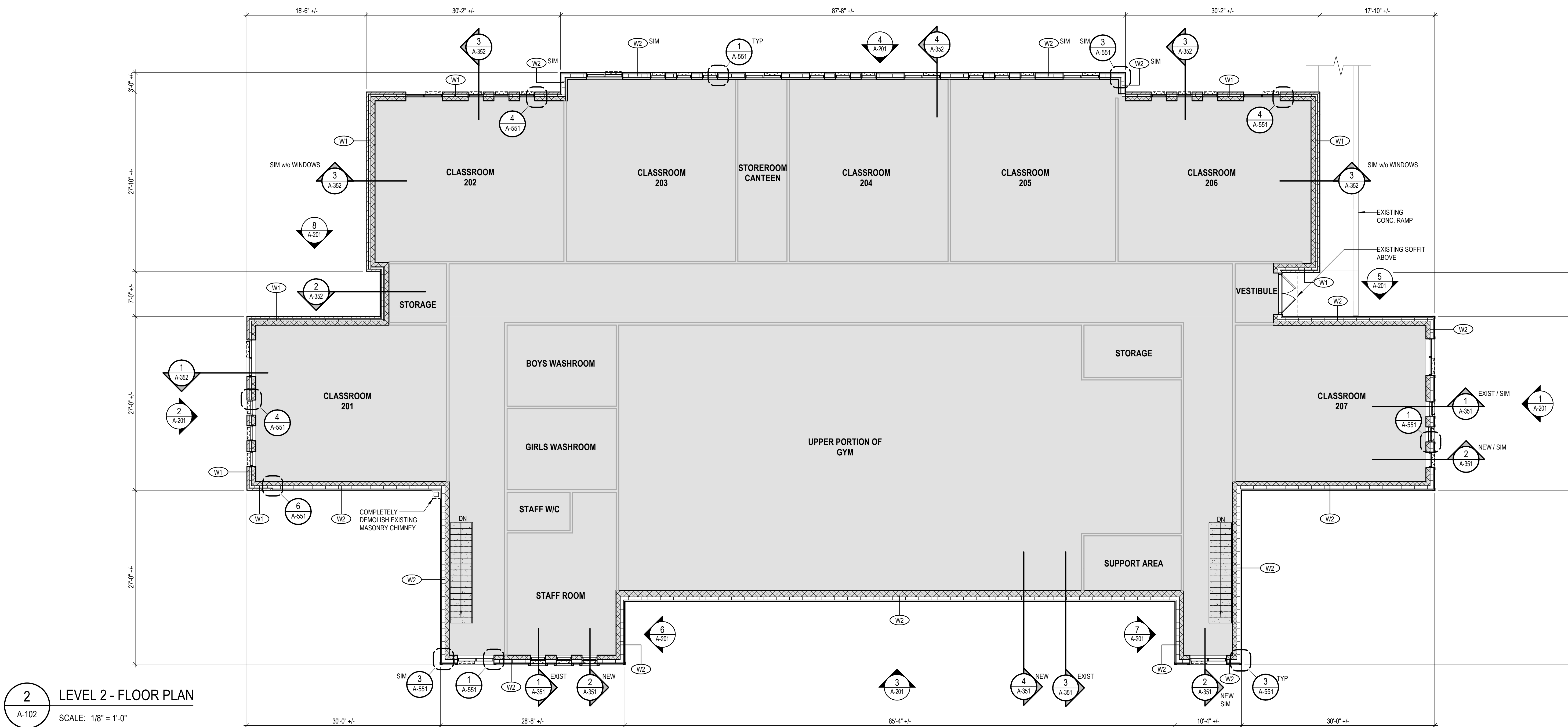
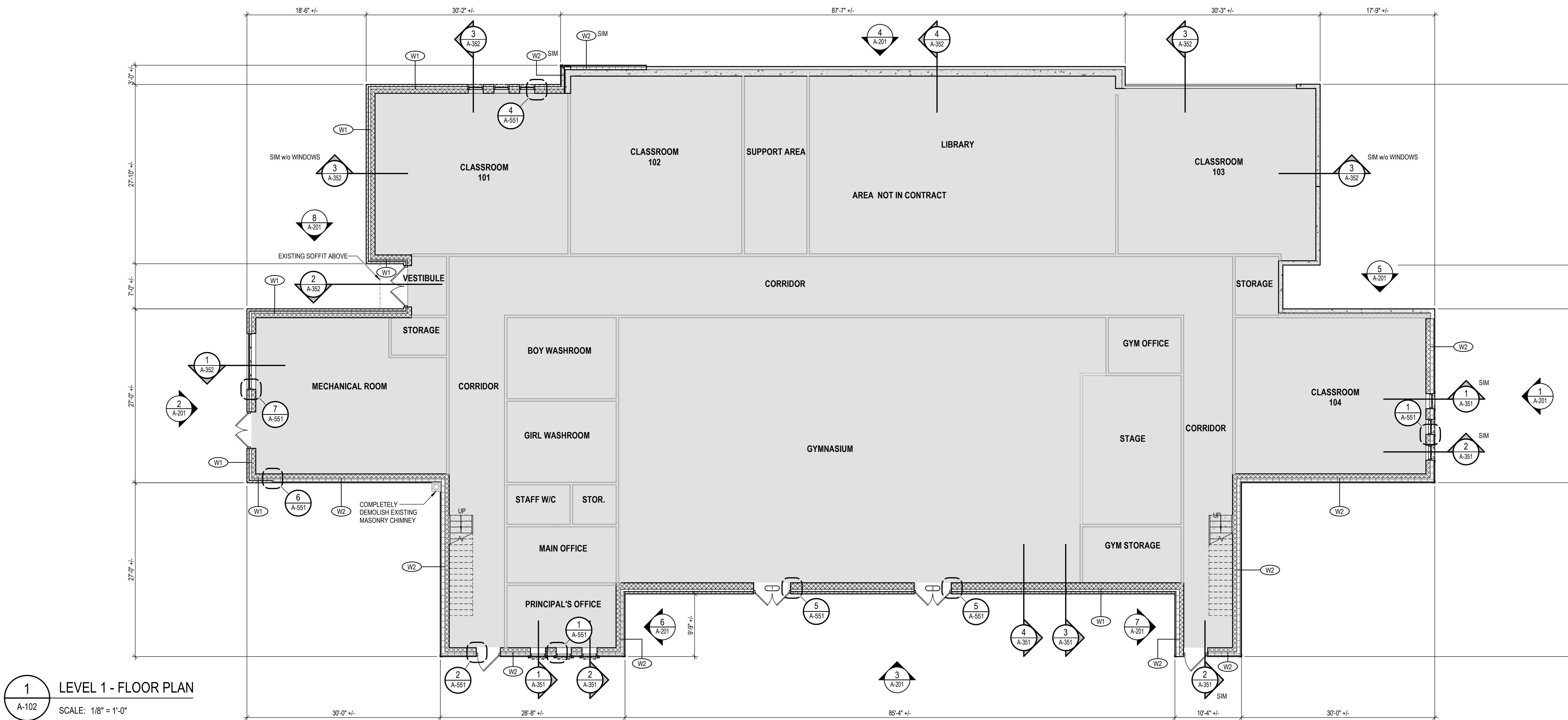
WALL ASSEMBLIES

EXISTING ASSEMBLY

- (XW1)
- BRICK VENEER (w/ MASONRY TIES)
 - AIR SPACE
 - 2" RIGID BOARD INSULATION (SPOT-ADHERED)
 - 8" and 12" CONCRETE BLOCK WALL

NEW ASSEMBLIES

- (W1)
- BRICK VENEER (w/ MASONRY PLATES/TIES)
 - 1 1/2" AIR SPACE
 - METAL GIRT ASSEMBLY INSTALLED ON 'THERMAL CLIPS'
 - 4" POLYISOCYANURATE BOARD INSULATION
 - SELF-ADHERED AIR/VAPOUR BARRIER MEMBRANE
 - EXISTING CONCRETE BLOCK WALL
- (W2)
- CORRUGATED METAL CLADDING
 - 1 1/2" AIR SPACE
 - METAL GIRT ASSEMBLY INSTALLED ON 'THERMAL CLIPS'
 - 6" MINERAL WOOL INSULATION (2 LAYERS)
 - SELF-ADHERED AIR/VAPOUR BARRIER MEMBRANE
 - EXISTING CONCRETE BLOCK WALL



0	ISSUED FOR TENDER	SED	11 SEP 2025
NO	REVISION	BY	DATE

STAMP

SCALE: 1/8" = 1'-0"

DRAWN: AL

CHECKED: SED

DATE: 11 SEP 2025

PROJECT

Harrietsfield School - Envelope Renewal

1150 Old Sambro Rd., Harrietsfield, NS

CLIENT

Halifax
Regional Centre for Education

PROJECT No: 2025-101

SHEET TITLE

FLOOR PLANS

1. EXTERIOR ELEVATIONS SHOW NEW CLADDING AND NEW WINDOW/DOWNS, AND RELATED NEW CLADDING TO EXISTING CLADDING AT ALL BUILDING FACADES. IS BRICK VENEER. ALL EXISTING WINDOWS ARE ALUMINUM.
2. CONTRACTOR TO MAKE GOOD ALL EXISTING SURFACES AND FINISHES AFFECTED BY THE WINDOW AND CLADDING WALK-INS AS DETAILED (OR NOT) BY THE DRAWINGS.
3. WHERE NECESSARY TO REPAIR TO MATCH ADJACENT MATERIALS AND FINISHES, EXTEND PATCH TO NEAREST NATURAL BREAK POINT, I.E. INSIDE CORNER, EXIST. JOINT OR LOCATION APPROVED BY THE ARCHITECT.
4. CONTRACTOR TO PROTECT AND MAINTAIN THE INTEGRITY OF EXISTING FINISHES IN ALL AREAS NOT SCHEDULED FOR DEMOLITION WORK, ANY DAMAGE DUE TO DEMOLITION AND/OR NEW CONSTRUCTION TO BE REPAIRED AND MADE GOOD.
5. DO NOT ALLOW ANY ADHESIVE ODORS AND OTHER POLLUTANTS FROM CONSTRUCTION ACTIVITIES TO ENTER THE BUILDING OR AFFECT MECHANICAL SYSTEMS.
6. CONTRACTOR TO REMOVE AND LAWFULLY DISPOSE OFF SITE ALL RUBBISH AND DEBRIS RESULTING FROM CONSTRUCTION KEEP PROTECT AREA BROOMCLEAN WITHIN REASONABLE LIMITS REMOVE AND DISPOSE CONSTRUCTION DEBRIS TO BE SORTED AND TAKEN TO APPROPRIATE FACILITIES FOR RECYCLING.
7. CONTRACTOR TO REPAIR AND MAKE GOOD ALL EXISTING FLOORS, WALLS, AND CEILINGS THAT ARE THE RESULT OF DEMOLITION AND PREPARE SURFACES TO RECEIVE FRESH FINISHES.
8. ALLOW FOR PROPER VENTILATION OF THE PREMISES DURING THE WORK.
9. REPORT ANY HAZARDOUS MATERIALS FOUND ON SITE TO HRCE PROJECT MANAGER.
10. GREY SHADED COMPONENTS ARE NOT PART OF THE WORK OF THIS CONTRACT.
11. PROCEED WITH DIMENSIONS ON SITE PRIOR TO PROCEEDING WITH WORK. NOTIFY HRCE IF ANY DISCREPANCIES BETWEEN AS FOUND CONDITIONS AND CONTRACT DOCUMENTS IMMEDIATELY UPON DISCOVERY OF SUCH CONDITIONS.

	AREA NOT IN CONTRACT (NIC)
	NEW BRICK VENEER; COLOUR T.B.D.
	NEW METAL CORRUGATED CLADDING; COLOUR T.B.D.
	NEW METAL SECURITY SCREEN
	WINDOW TYPE ID TAG
	DOOR TYPE TAG (REFER TO DOOR SCHEDULE)
	CONTROL JOINT IN BRICK VENEER w/ AIR BAFFLE

- 1 REMOVE LOOSE/DETERIORATED CONCRETE AT BASE OF DOOR/REINSTEAL EXISTING DOOR THRESHOLD, AS REQUIRED; INSTALL NEW CONCRETE REPAIR MORTAR
- 2 REPAINT EXISTING STEEL DOOR AND FRAME
- 3 REMOVE EXISTING STEEL DOOR AND FRAME REPLACE WITH NEW STEEL DOOR AND FRAME
- 4 NEW PRE-FINISHED METAL TRIM
- 5 REMOVE EXISTING METAL FASCIA FLASHING; INSTALL NEW PRE-FINISHED METAL FASCIA
- 6 NEW GALVANIZED STEEL LINTEL
- 7 EXISTING LIGHT FIXTURE (REMOVE AND REINSTALL)
- 8 EXISTING SCHOOL BELL (REMOVE AND REINSTALL)
- 9 EXISTING SIGNAGE (REMOVE AND REINSTALL)
- 10 NEW PRE-FINISHED METAL DOWNSPUT; REMOVE EXISTING DOWNSPUTS.
- 11 CEMENT BOARD

xW1

1. BRICK VENEER (w/ MASONRY TIES)
2. AIR SPACE
3. 2" RIGID BOARD INSULATION (SPOT-ADHERED)
4. 8" and 12" CONCRETE BLOCK WALL

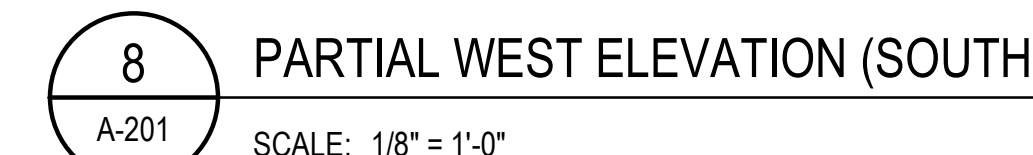
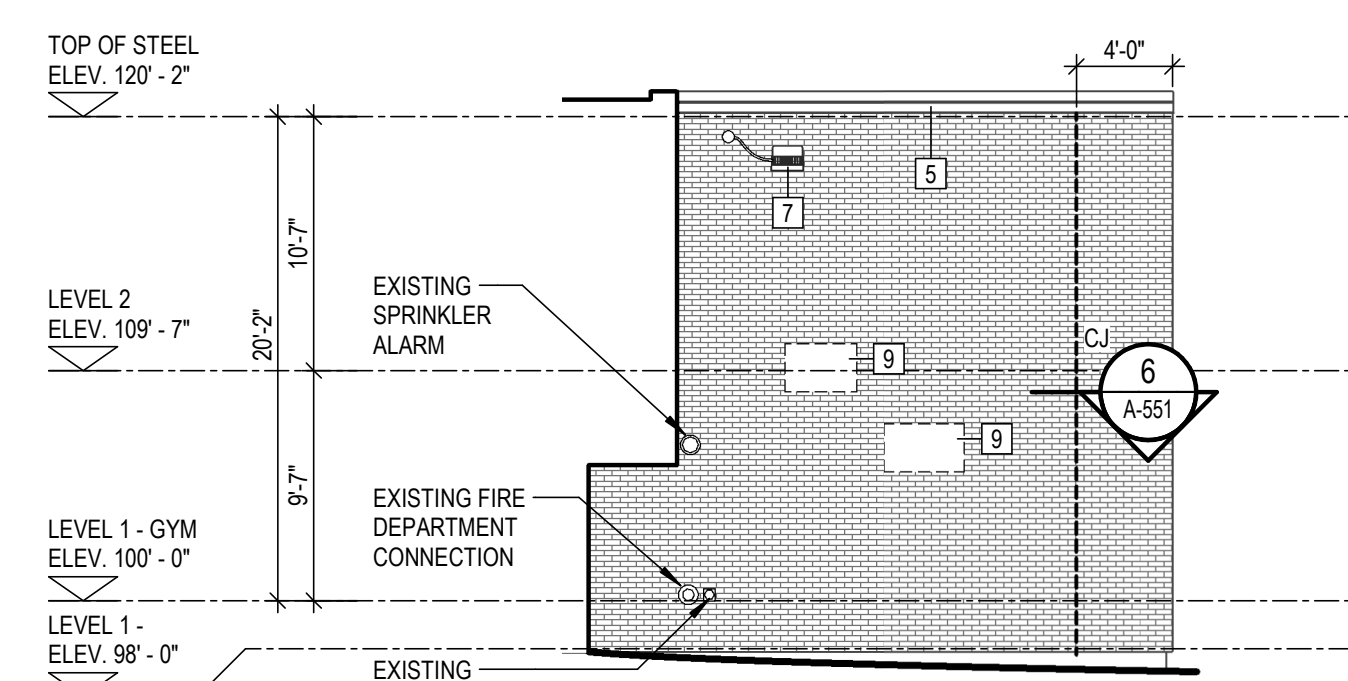
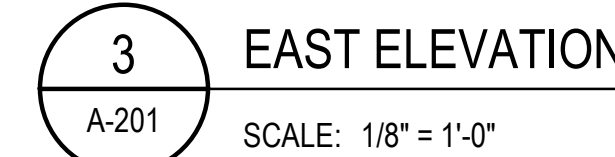
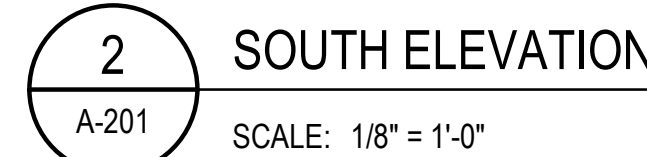
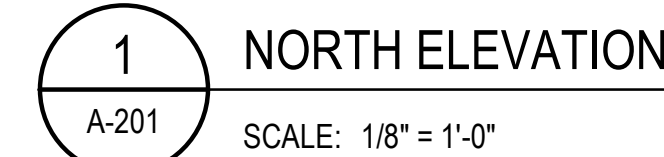
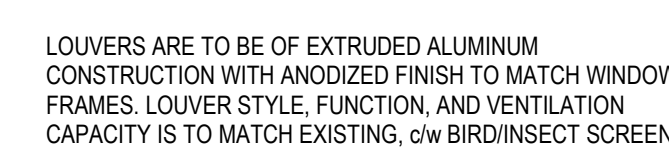
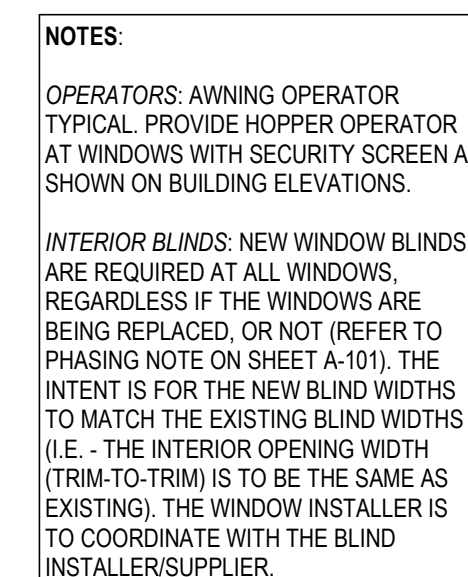
W1

1. BRICK VENEER (w/ MASONRY PLATES/TIES)
2. 1" AIR SPACE
3. 4" POLYISOCYANURATE BOARD INSULATION
4. SELF-ADHERED AIR/VAPOUR BARRIER MEMBRANE
5. EXISTING CONCRETE BLOCK WALL

W2

1. CORRUGATED METAL CLADDING
2. 1 1/2" AIR SPACE
3. METAL GIRT ASSEMBLY INSTALLED ON THERMAL CLIP
4. 6" MINERAL WOOL INSULATION (2 LAYERS)
5. SELF-ADHERED AIR/VAPOUR BARRIER MEMBRANE
6. EXISTING CONCRETE BLOCK WALL

1. REMOVE EXTERIOR BRICK VENEER, INCLUDING MASONRY TIES, INSULATION, FLASHINGS, SEALANTS, ETC.
2. REMOVE EXISTING WINDOWS AND SECURITY SCREENS. REMOVE GYM DOORS. REMOVE ASSOCIATED TRIMS, CLIPS, FLASHINGS, SEALANTS, FASTENERS, ETC.
3. REMOVE ALL EXISTING STEEL SHELF ANGLES AND LOOSE LINTELS.
4. REFER TO 'EXISTING' WALL SECTIONS, SECTION DETAILS, AND PLAN DETAILS.

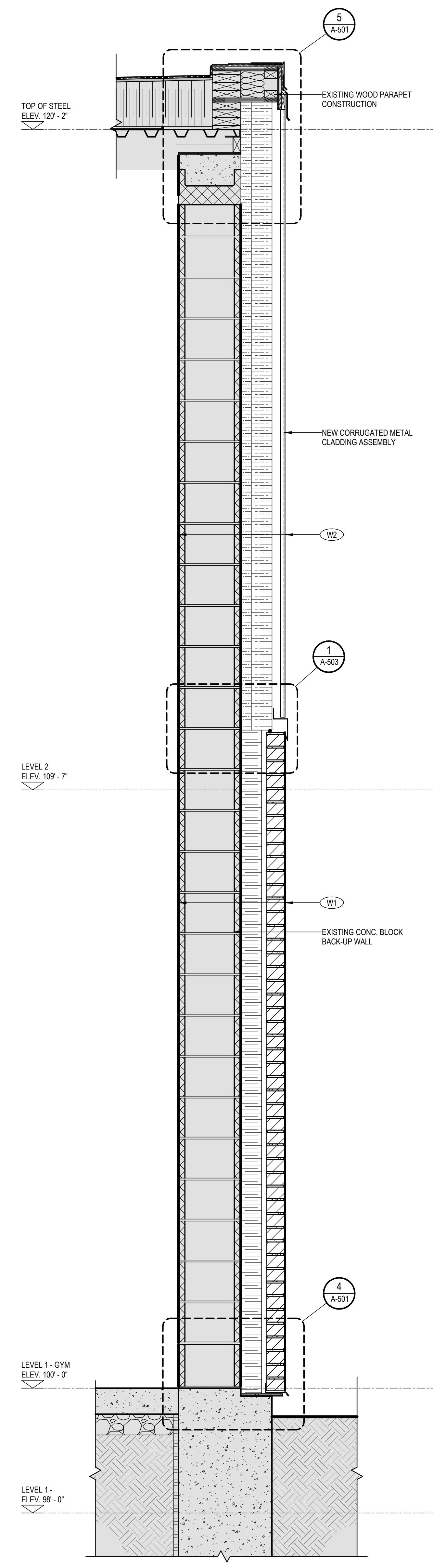
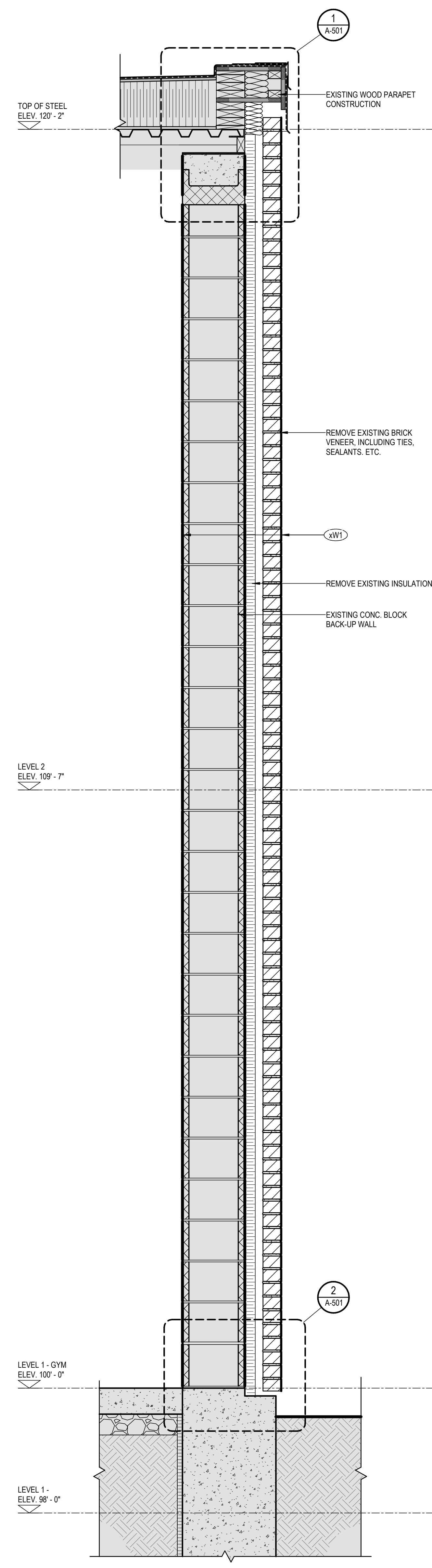
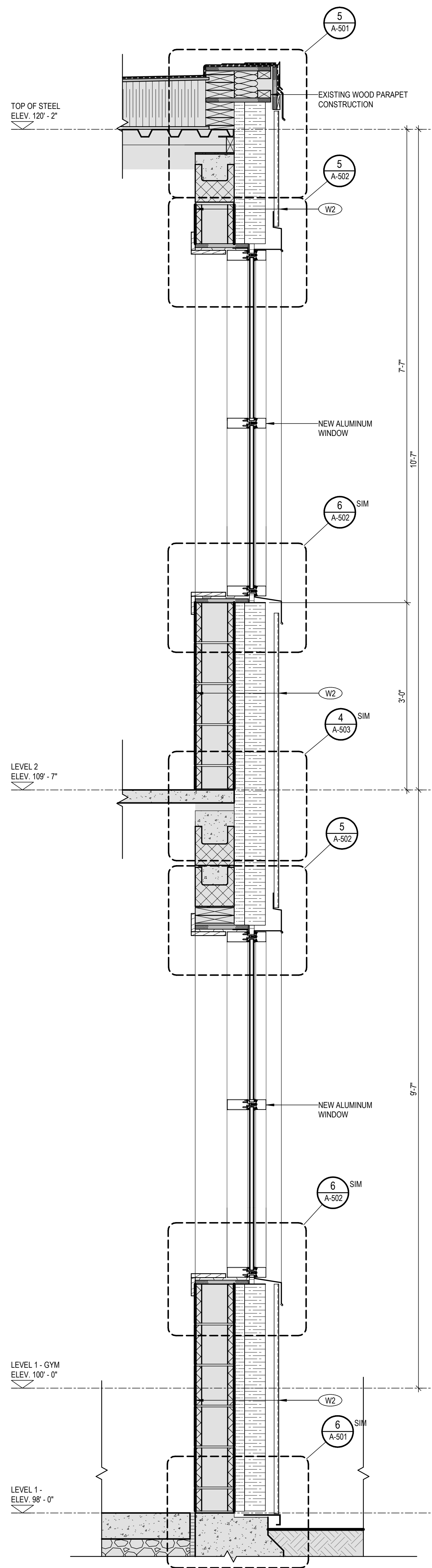
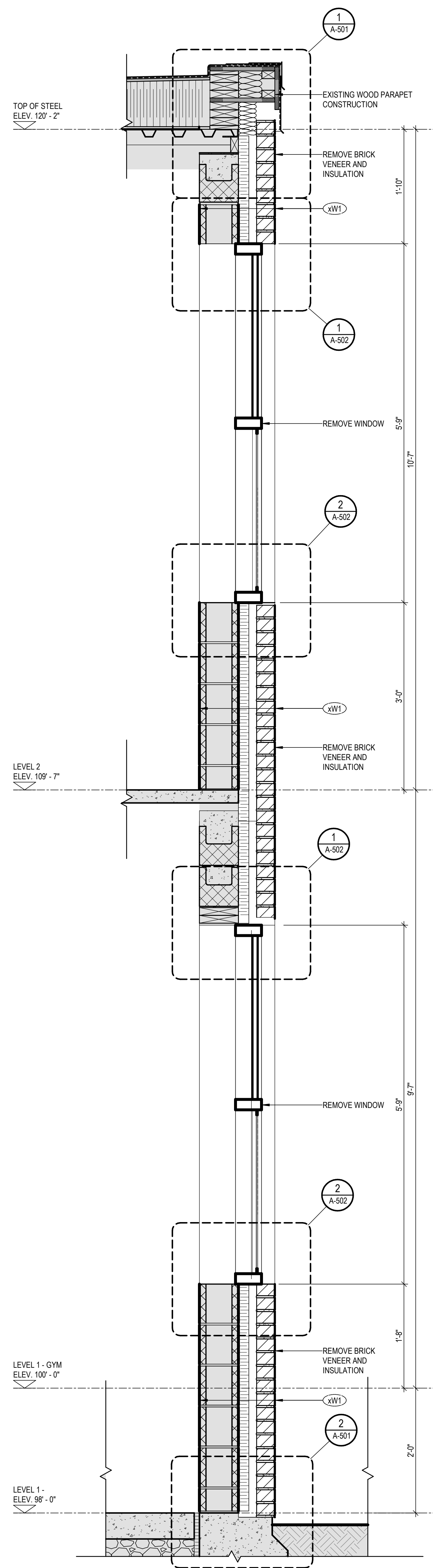
F1

ENGAGE QUALIFIED MECHANICAL CONTRACTOR FOR LOUVER SPECIFICATION AND INSTALLATION. ENSURE EXISTING DUCTWORK CONNECTION TO NEW LOUVER IS REINSTATED.

SUBMIT SEPARATE LUMP SUM PRICES FOR EACH PHASE INDICATED, PER 00 41 13, PRICE SUBMISSION FORM.

THE EXPECTATION IS THAT ALL EXISTING WINDOWS WILL BE REPLACED AT EACH PHASE THEY OCCUR. HOWEVER, HRCE MAY OPT TO NOT REPLACE THE WINDOWS. TO ACCOUNT FOR THIS IN THE BID SUBMISSION, A CREDIT AMOUNT RELATED TO RETAINING THE WINDOWS, PER PHASE, IS REQUIRED TO BE SUBMITTED (PER 00 43 13).

REFER TO SECTION AND PLAN DETAIL SHEETS FOR EXISTING
AND NEW WINDOW CONDITIONS.

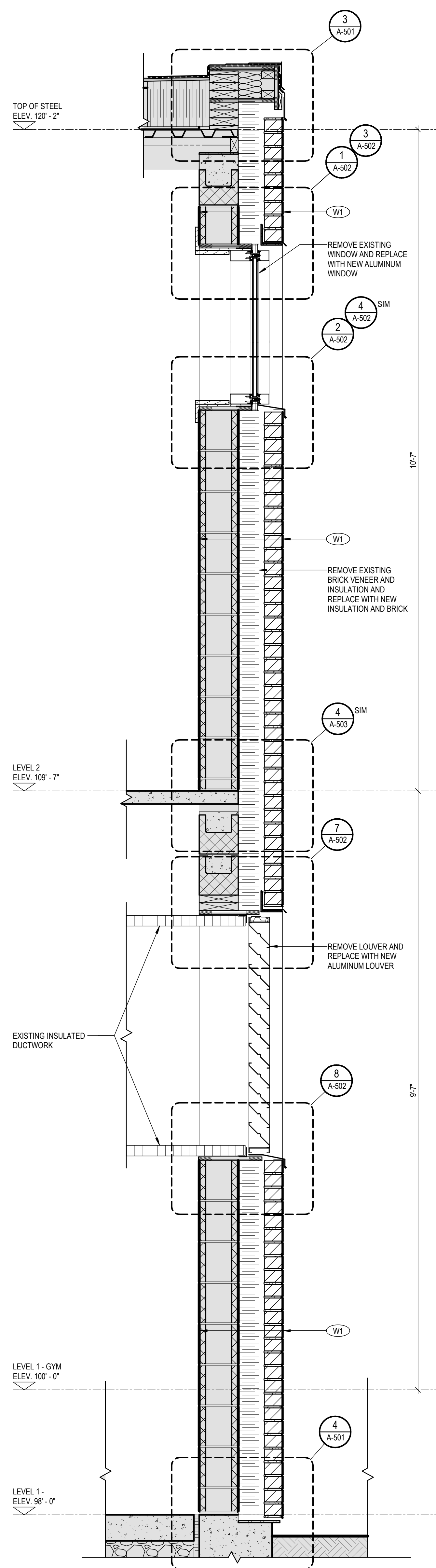


PRICING

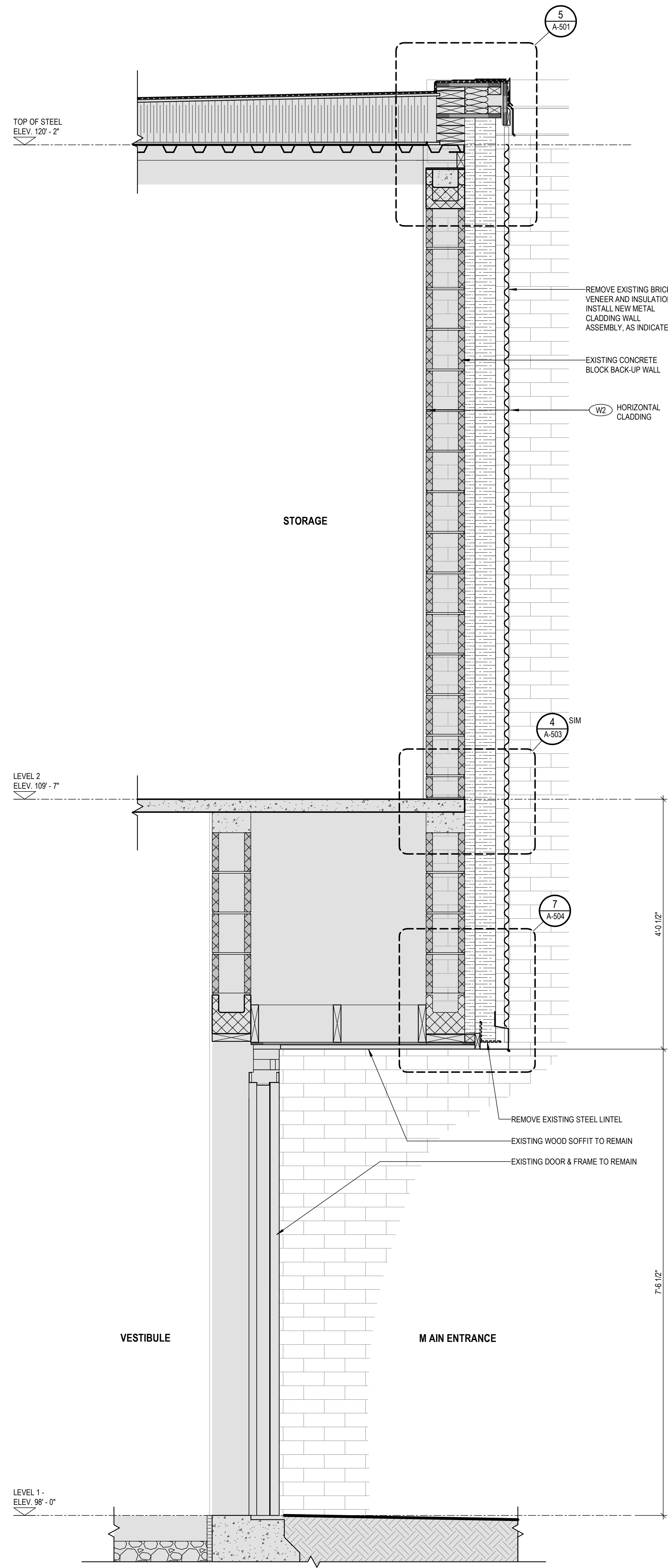
THE 'NEW' WALL SECTIONS SHOW NEW ALUMINUM WINDOWS. REFER TO PRICING NOTE ON A-101 AND A-301 FOR DESCRIPTION OF HOW BIDS ARE TO BE SUBMITTED WITH SEPARATE PRICES RELATED TO NEW AND EXISTING WINDOW CONDITIONS.

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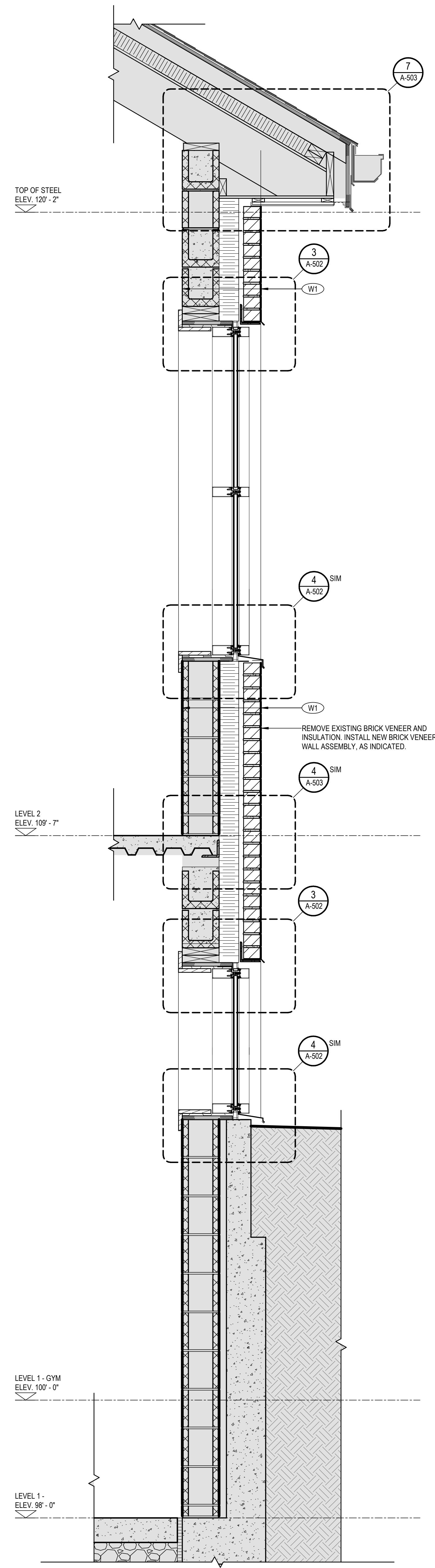
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CHECKED	SED
DATE	11 SEP 2025
PROJECT	Harrietsfield School - Envelope Renewal
CLIENT	1150 Old Sambro Rd., Harrietsfield, NS
CLIENT	Halifax Regional Centre for Education
PROJECT No.	2025-101
SHEET TITLE	WALL SECTIONS



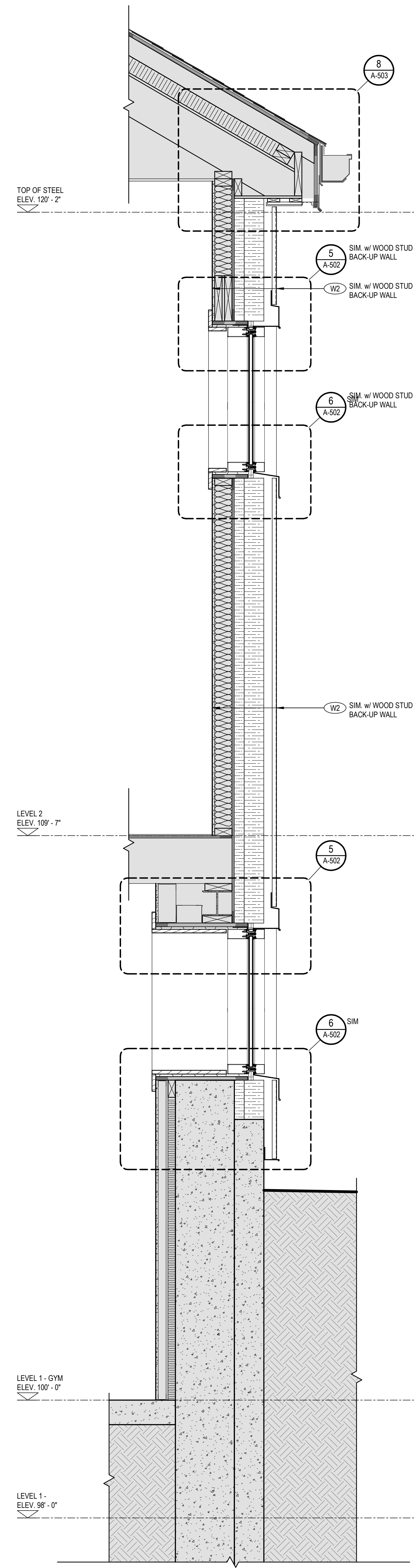
1 SECTION AT LOUVER (NEW)
A-352 SCALE: 1" = 1'-0"



2 SECTION AT MAIN ENTRANCE (NEW)
A-352 SCALE: 1" = 1'-0"



3 BRICK AT SLOPED ROOF
A-352 SCALE: 1" = 1'-0"



4 METAL CLADDING AT SLOPED ROOF
A-352 SCALE: 1" = 1'-0"

PRICING

THE 'NEW' WALL SECTIONS SHOW NEW ALUMINUM WINDOWS. REFER TO PRICING NOTE ON A-101 AND A-201 FOR DESCRIPTION OF HOW BIDS ARE TO BE SUBMITTED WITH SEPARATE PRICES RELATED TO NEW AND EXISTING WINDOW CONDITIONS.

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PROJECT			
Harrietsfield School - Envelope Renewal			
1150 Old Sambro Rd., Harrietsfield, NS			
CLIENT			
Halifax Regional Centre for Education			
PROJECT No: 2025-101			
SHEET TITLE			
WALL SECTIONS			

1 BRICK VENEER AT PARAPET (EXISTING)
A-501 SCALE: 3" = 1'-0"

3 BRICK VENEER AT PARAPET (NEW)
A-501 SCALE: 3" = 1'-0"

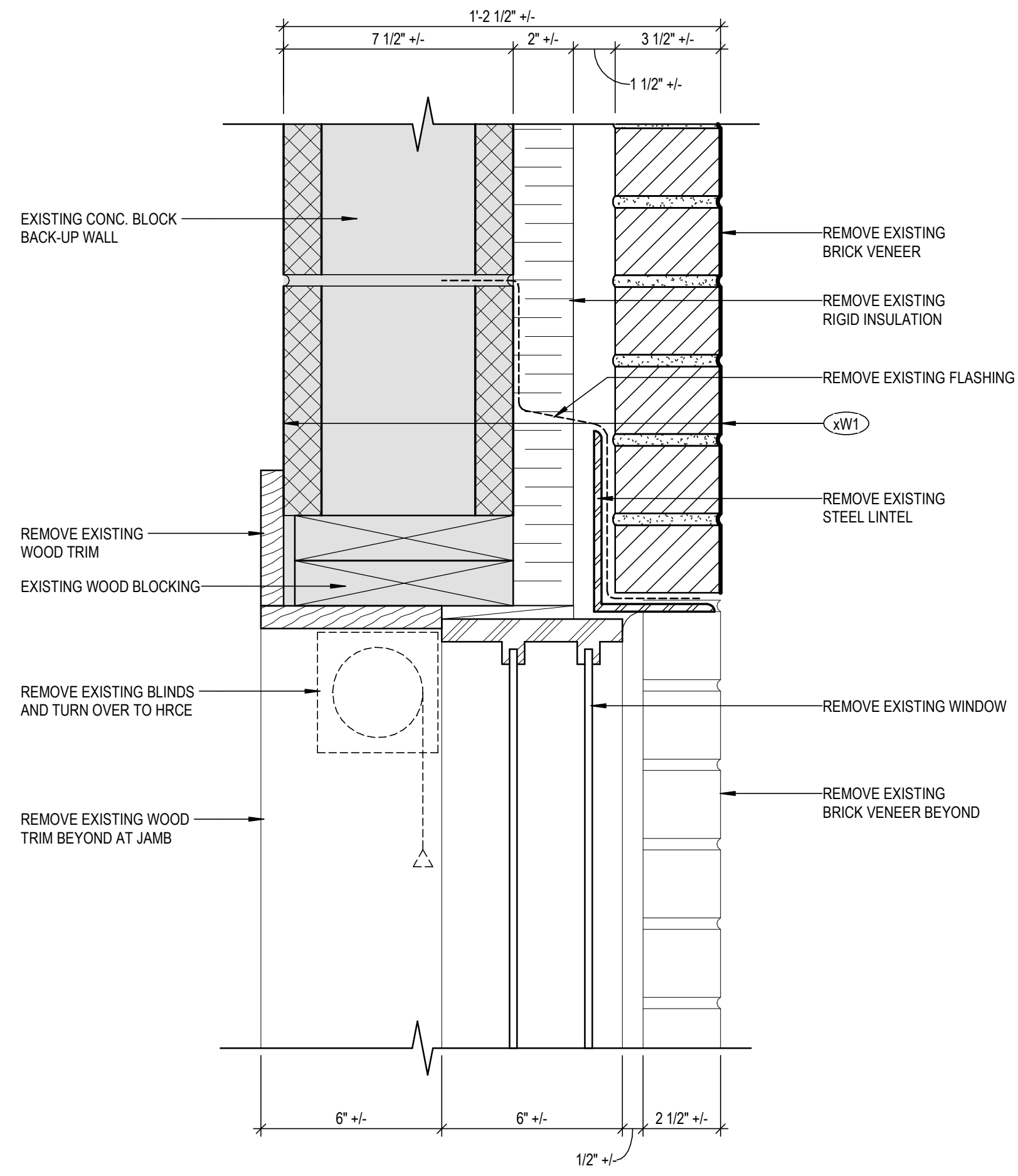
5 METAL CLADDING AT PARAPET
A-501 SCALE: 3" = 1'-0"

2 BRICK VENEER AT FOUNDATION (EXISTING)
A-501 SCALE: 3" = 1'-0"

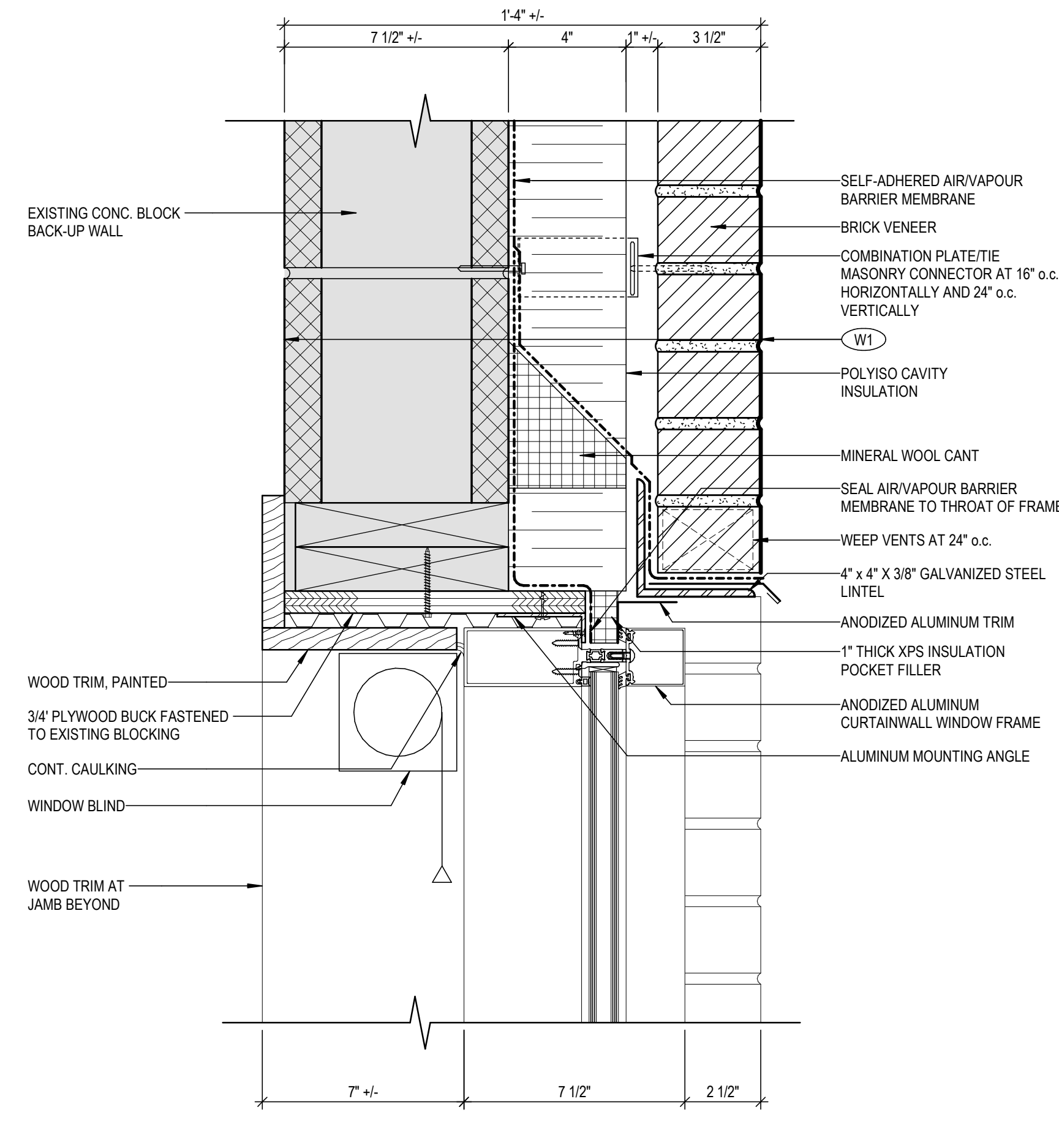
4 BRICK VENEER AT FOUNDATION (NEW)
A-501 SCALE: 3" = 1'-0"

6 METAL CLADDING AT FOUNDATION (NEW)
A-501 SCALE: 3" = 1'-0"

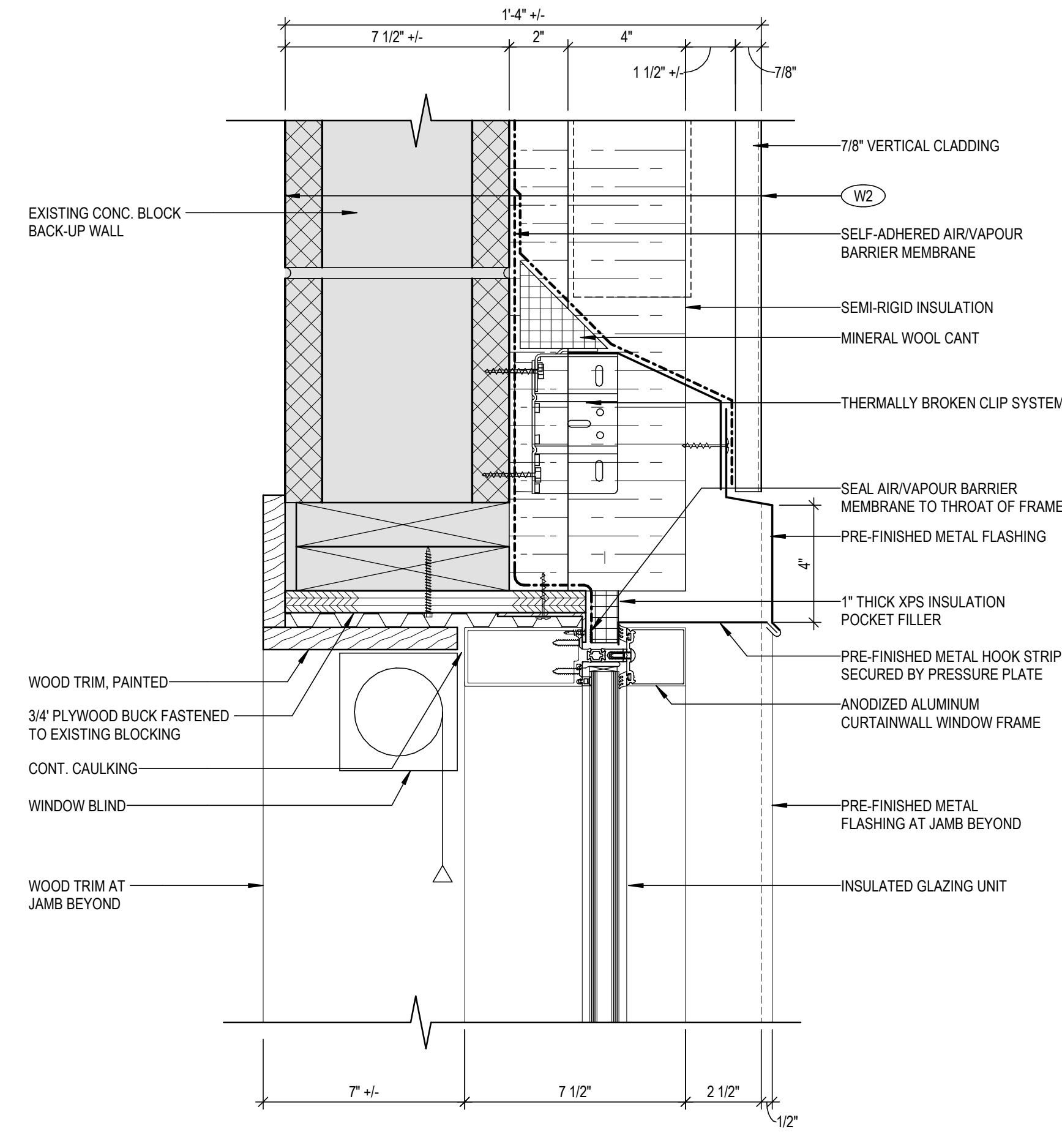
A-501



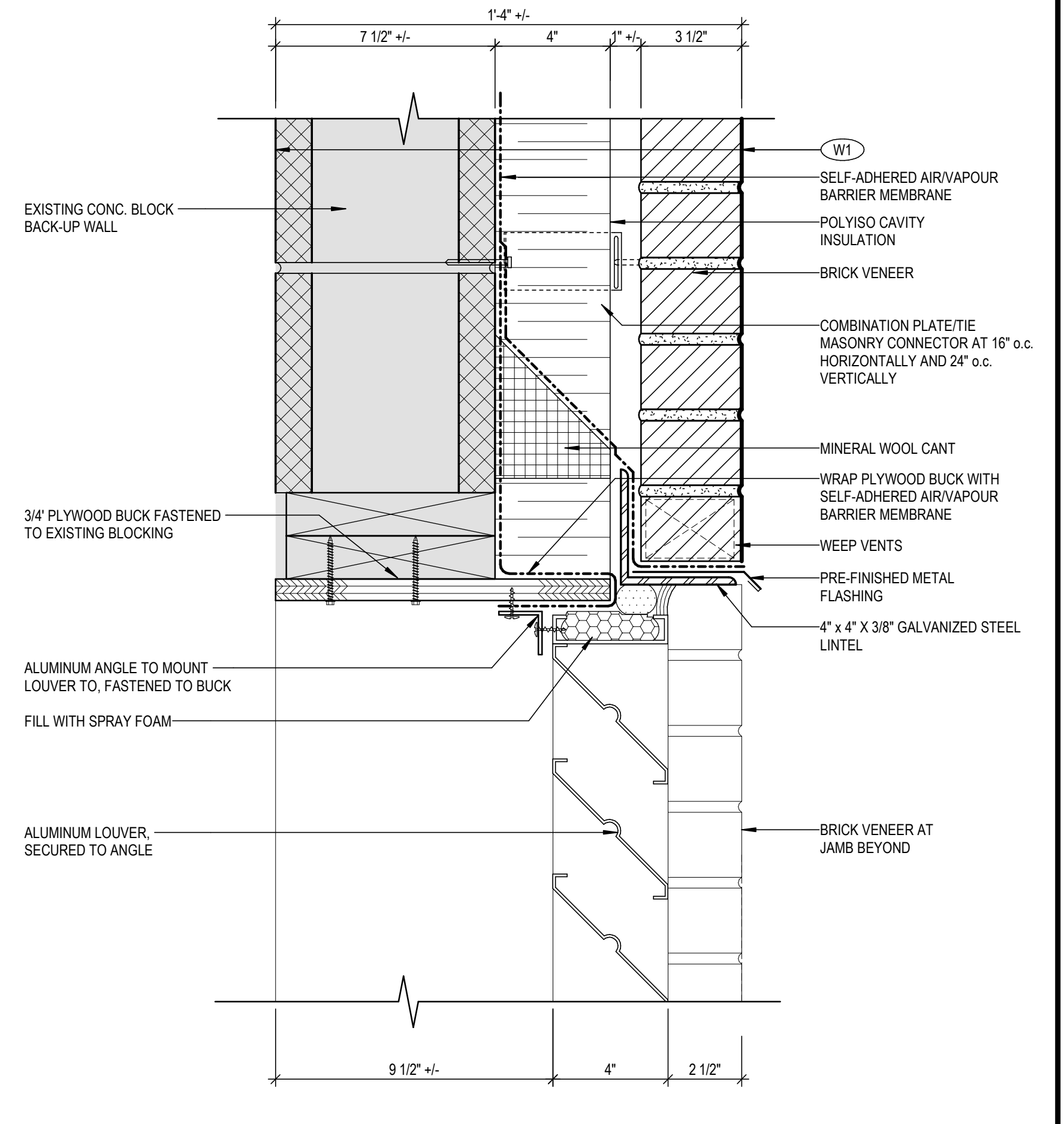
1 WINDOW HEAD AT BRICK VENEER (EXISTING)
A-502 SCALE: 3" = 1'-0"



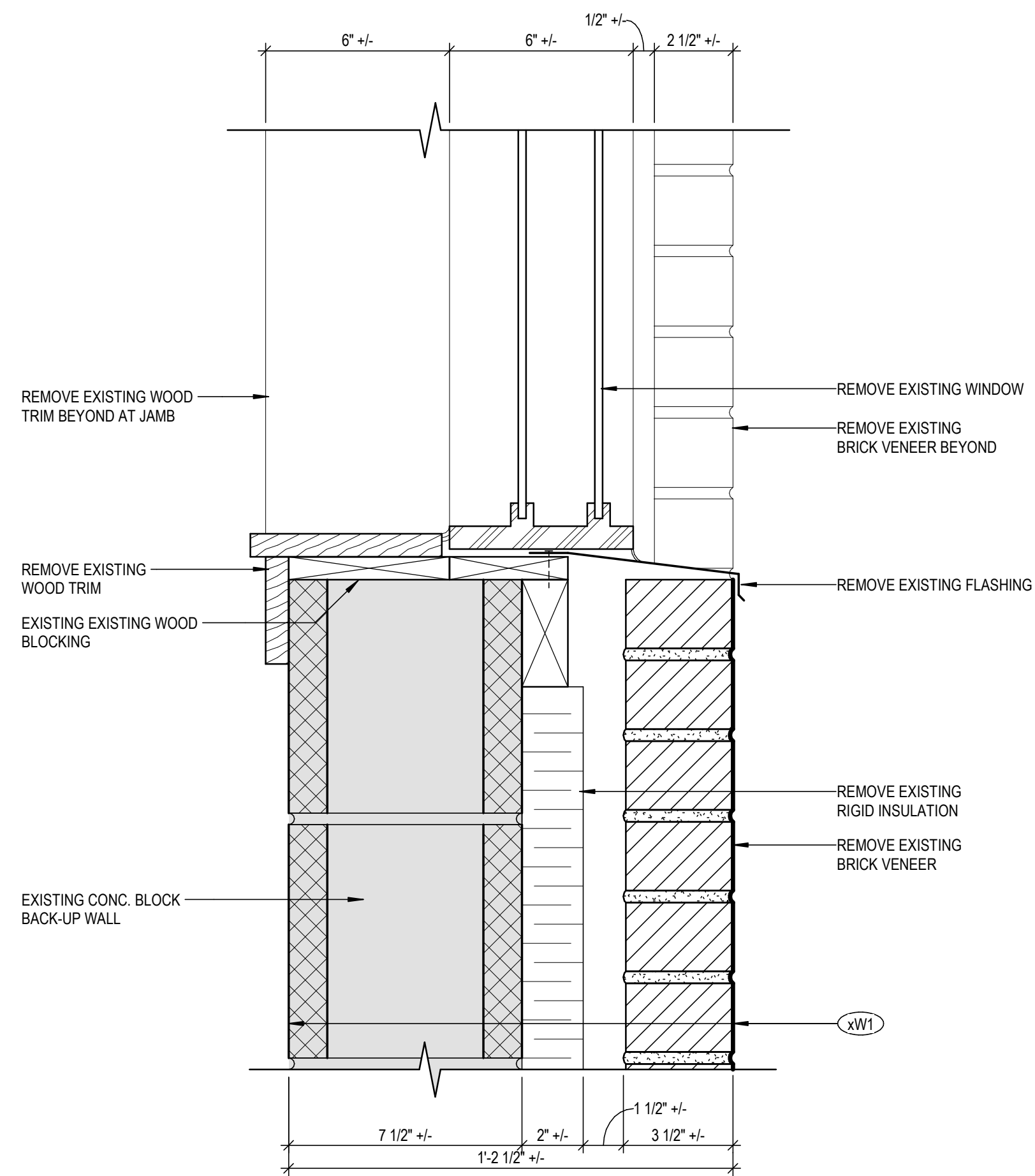
3 WINDOW HEAD AT BRICK VENEER
A-502 SCALE: 3" = 1'-0"



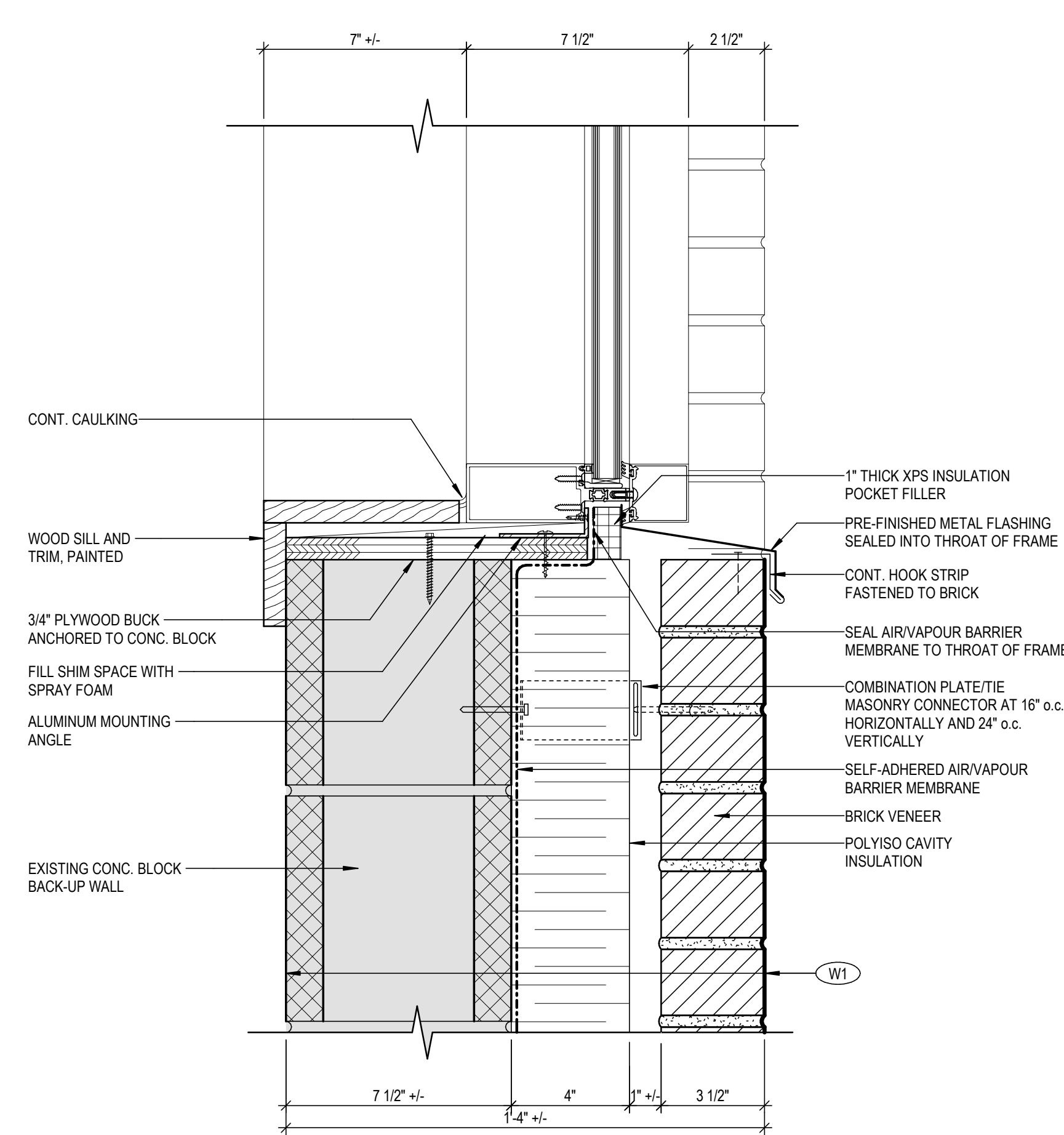
5 WINDOW HEAD AT METAL CLADDING
A-502 SCALE: 3" = 1'-0"



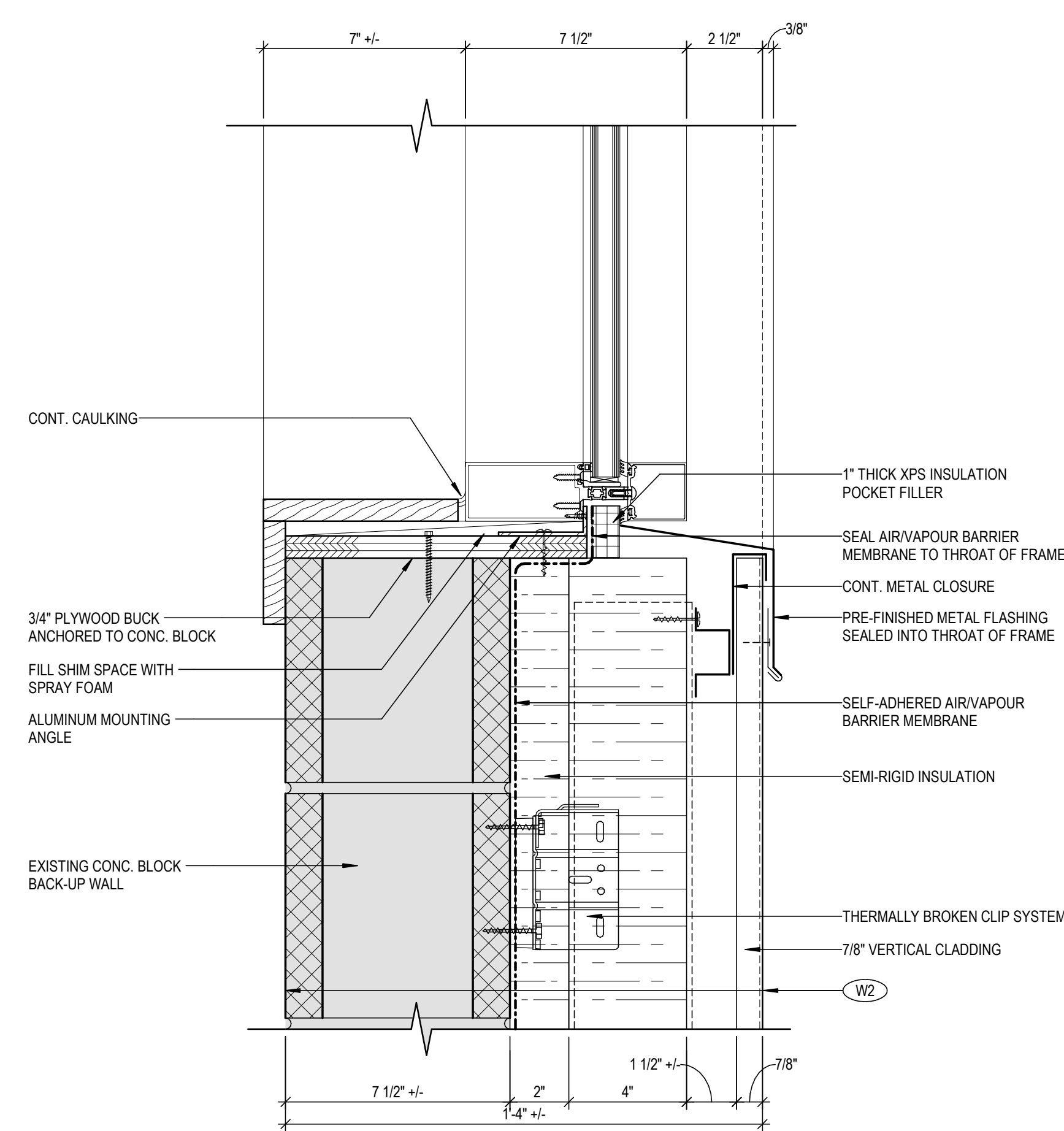
7 LOUVER HEAD AT BRICK VENEER
A-502 SCALE: 3" = 1'-0"



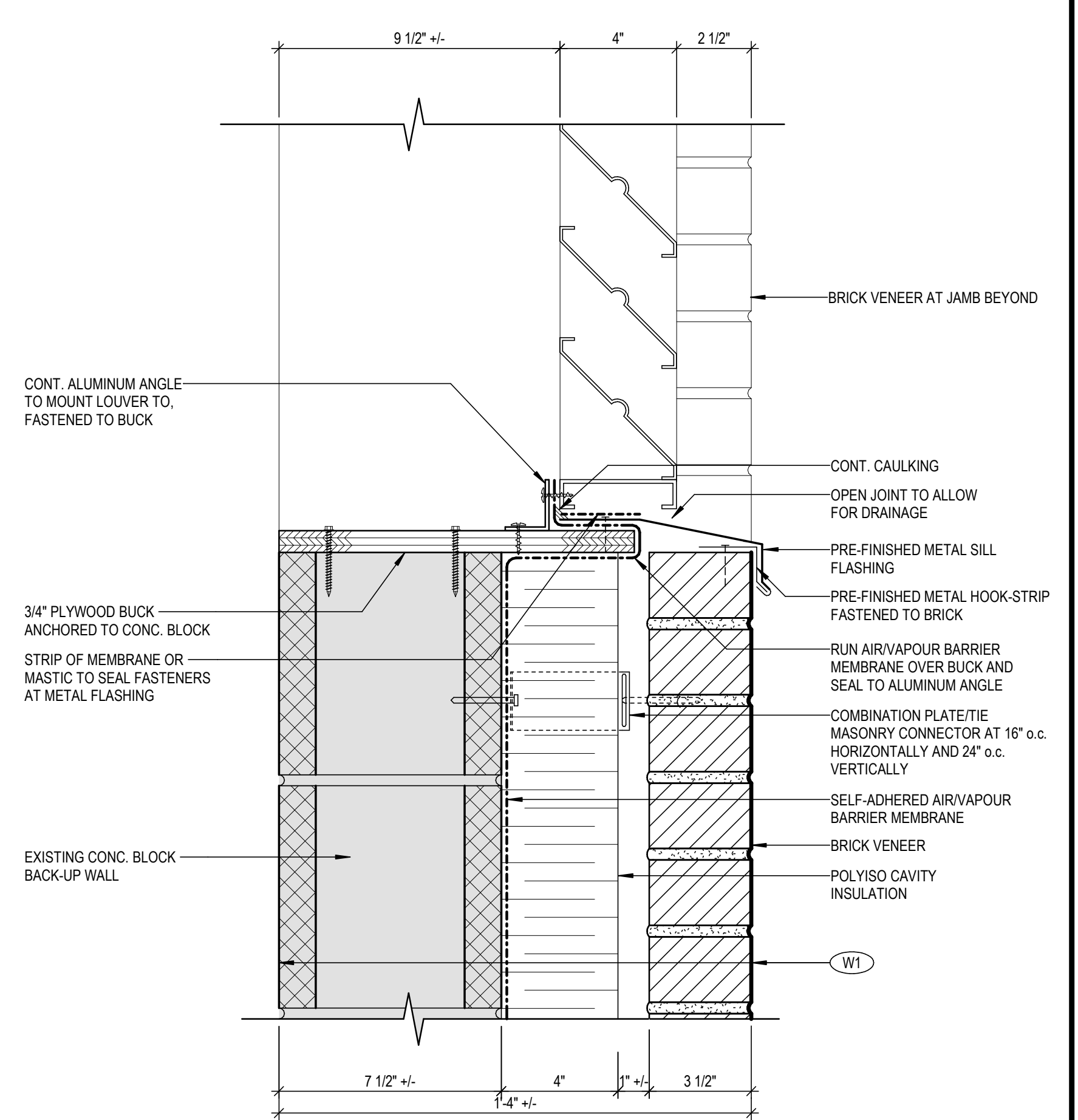
2 WINDOW SILL AT BRICK VENEER (EXISTING)
A-502 SCALE: 3" = 1'-0"



4 WINDOW SILL AT BRICK VENEER (NEW)
A-502 SCALE: 3" = 1'-0"



6 WINDOW SILL AT METAL CLADDING
A-502 SCALE: 3" = 1'-0"



8 LOUVER SILL AT BRICK VENEER (NEW)
A-502 SCALE: 3" = 1'-0"

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CONT. CAULKING
OPEN JOINT TO ALLOW FOR DRAINAGE
PRE-FINISHED METAL SILL FLASHING
PRE-FINISHED METAL HOOK-STRIP FASTENED TO BRICK
RUN AIR/VAPOUR BARRIER MEMBRANE OVER BUCK AND SEAL TO ALUMINUM ANGLE
COMBINATION PLATE/TIE MASONRY CONNECTOR AT 16" o.c. HORIZONTALLY AND 24" o.c. VERTICALLY
SELF-ADHERED AIR/VAPOUR BARRIER MEMBRANE
BRICK VENEER
POLYISO CAVITY INSULATION

SCALE 3" = 1'-0"
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CHECKED SED
DATE 11 SEP 2025

PROJECT

Harrietsfield School - Envelope Renewal
1150 Old Sambro Rd., Harrietsfield, NS

CLIENT

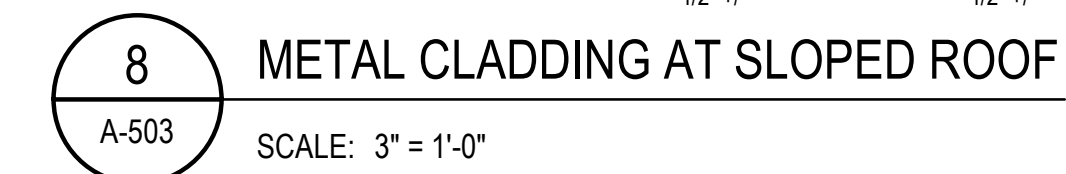
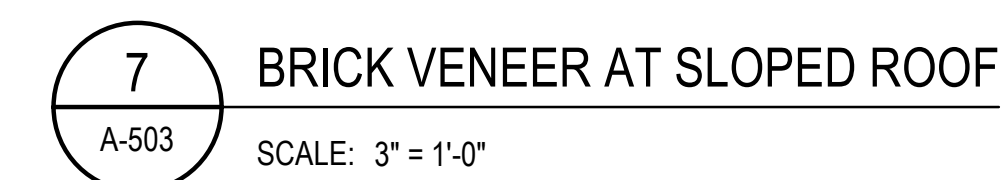
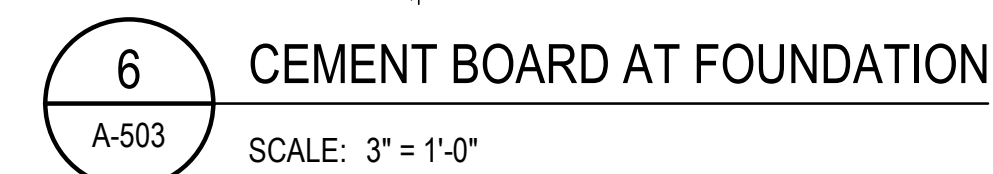
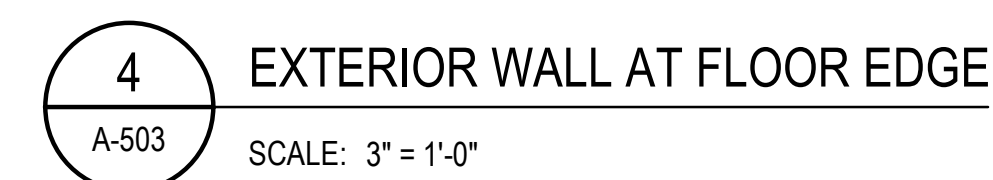
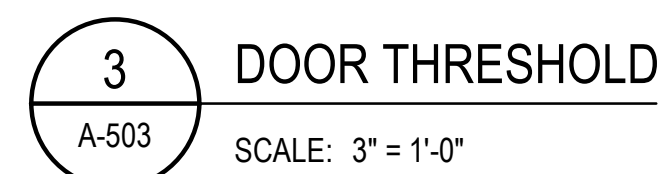
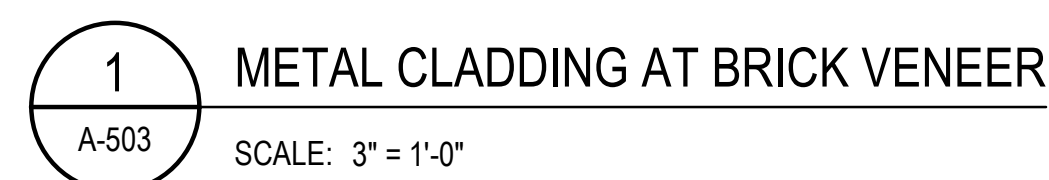
Halifax Regional Centre for Education

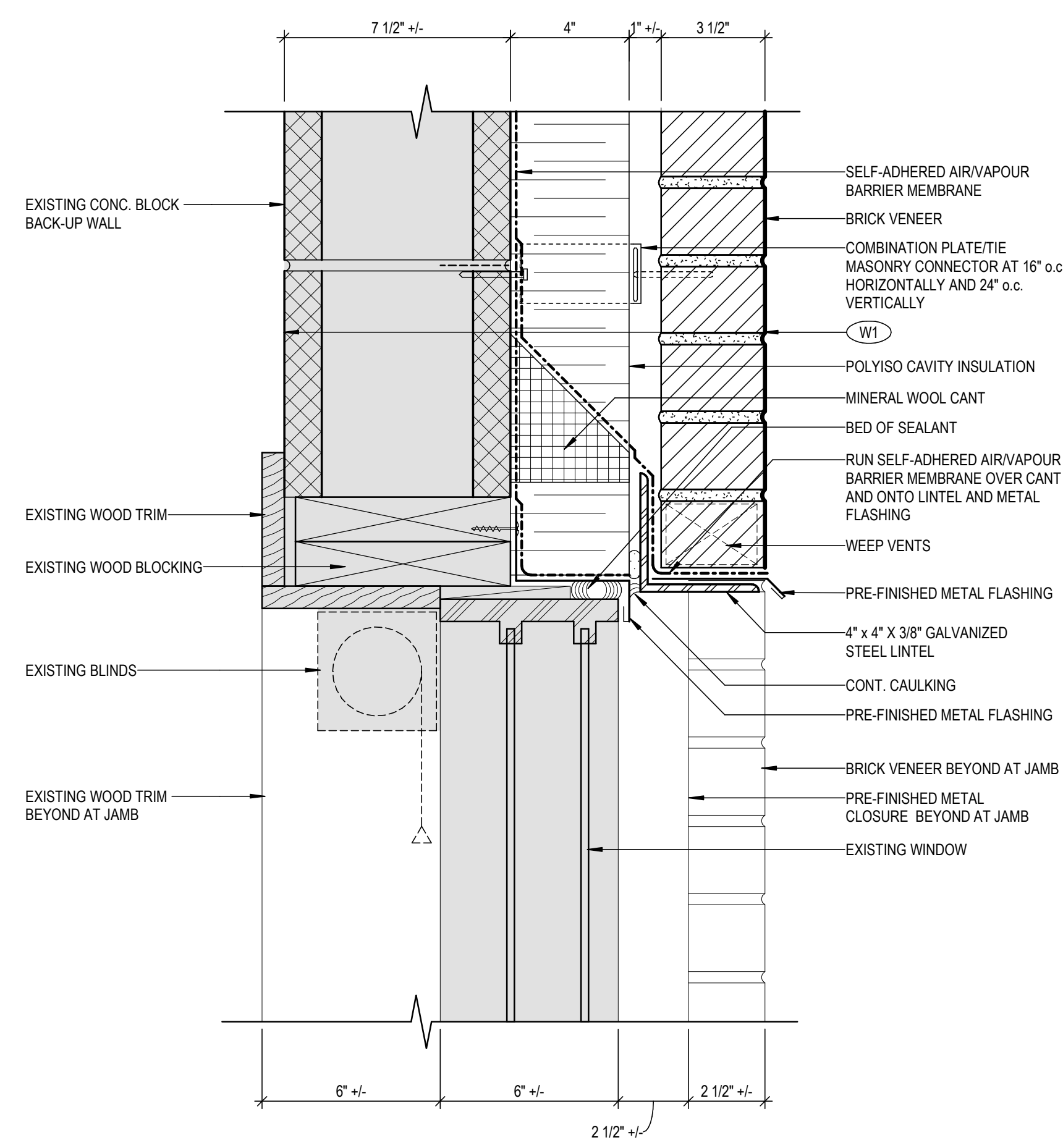
PROJECT No. 2025-101

SHEET TITLE

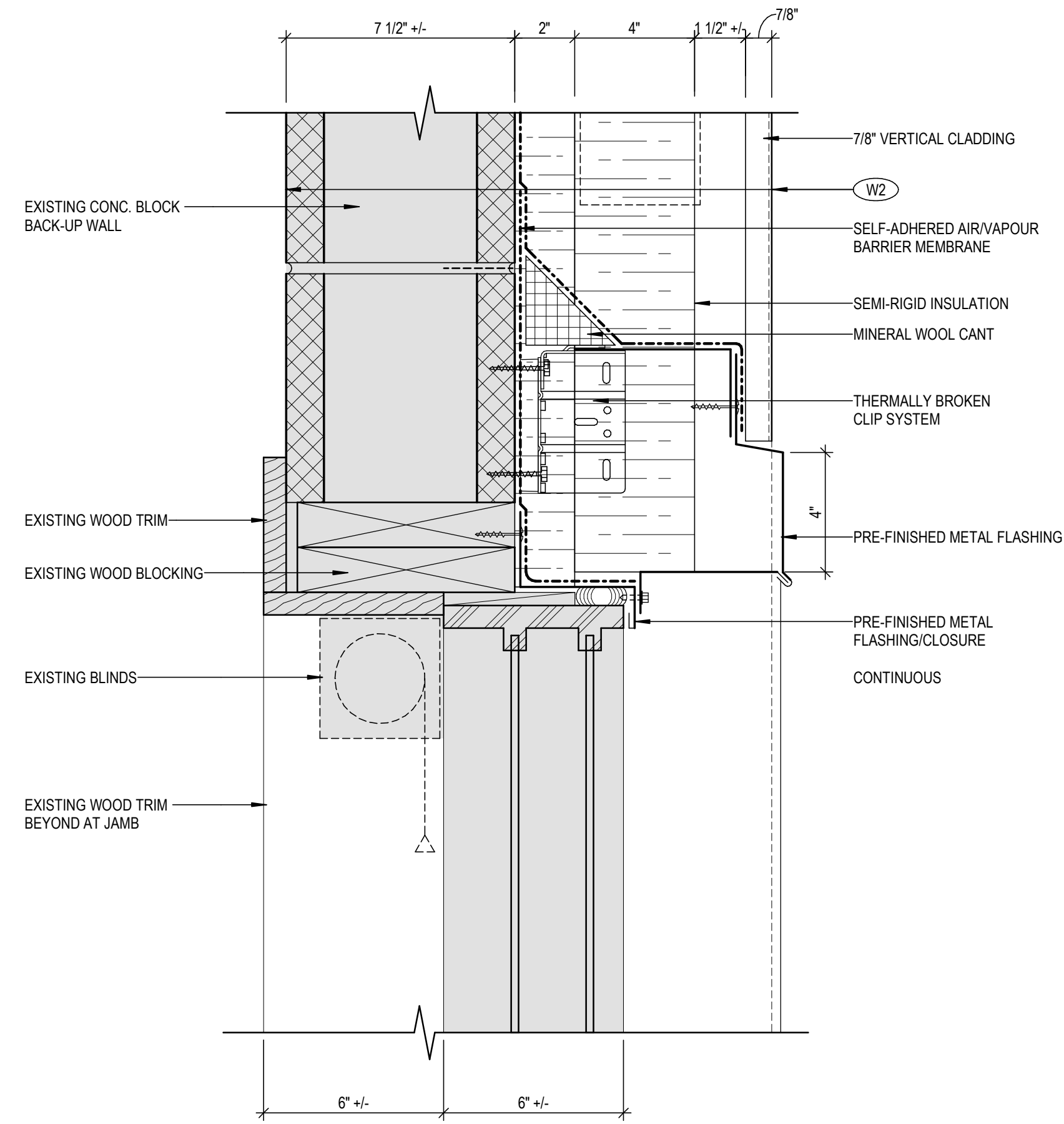
SECTION DETAILS

A-502

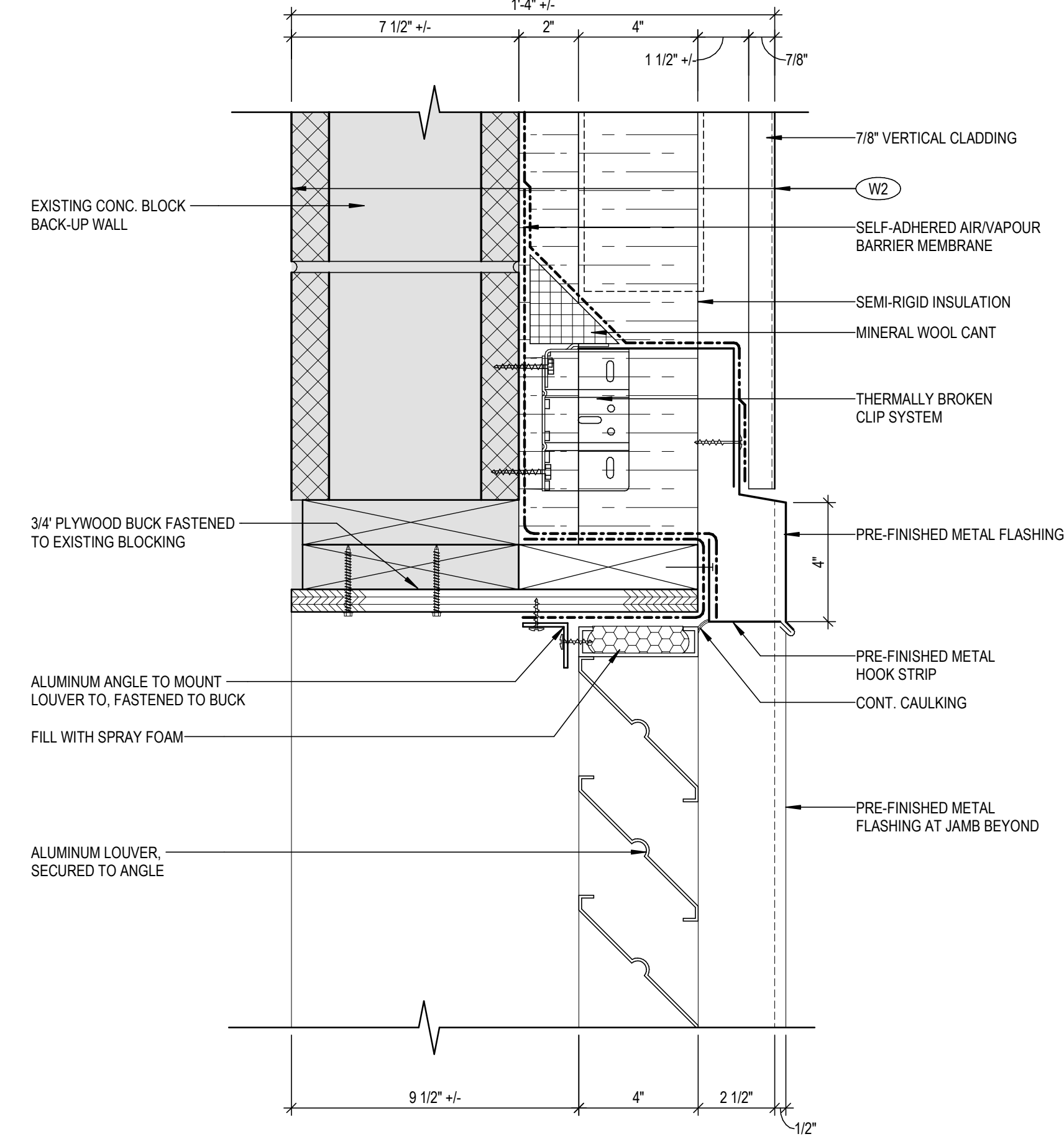




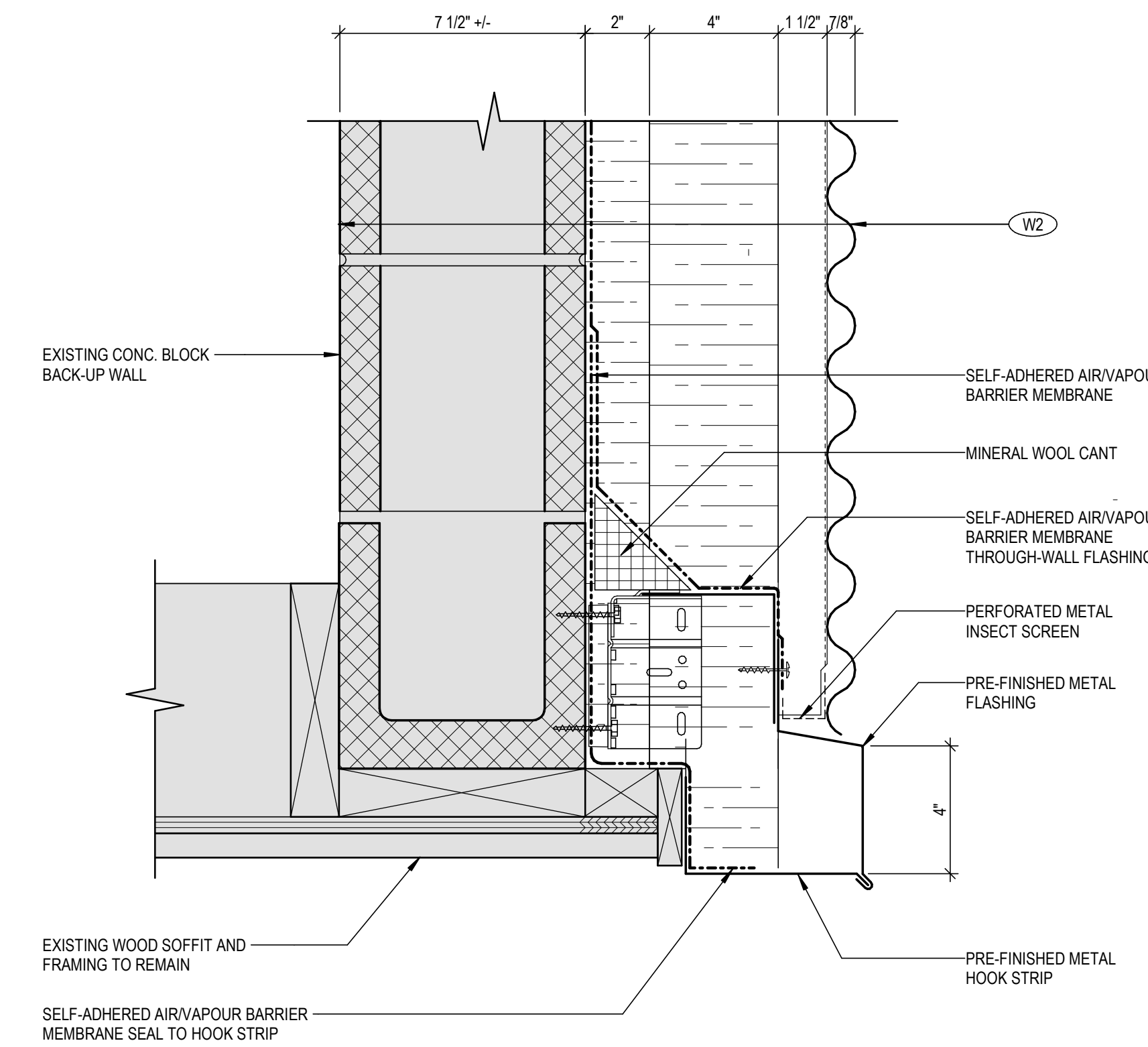
1 EXISTING WINDOW HEAD AT BRICK VENEER (NEW)
A-504 SCALE: 3" = 1'-0"



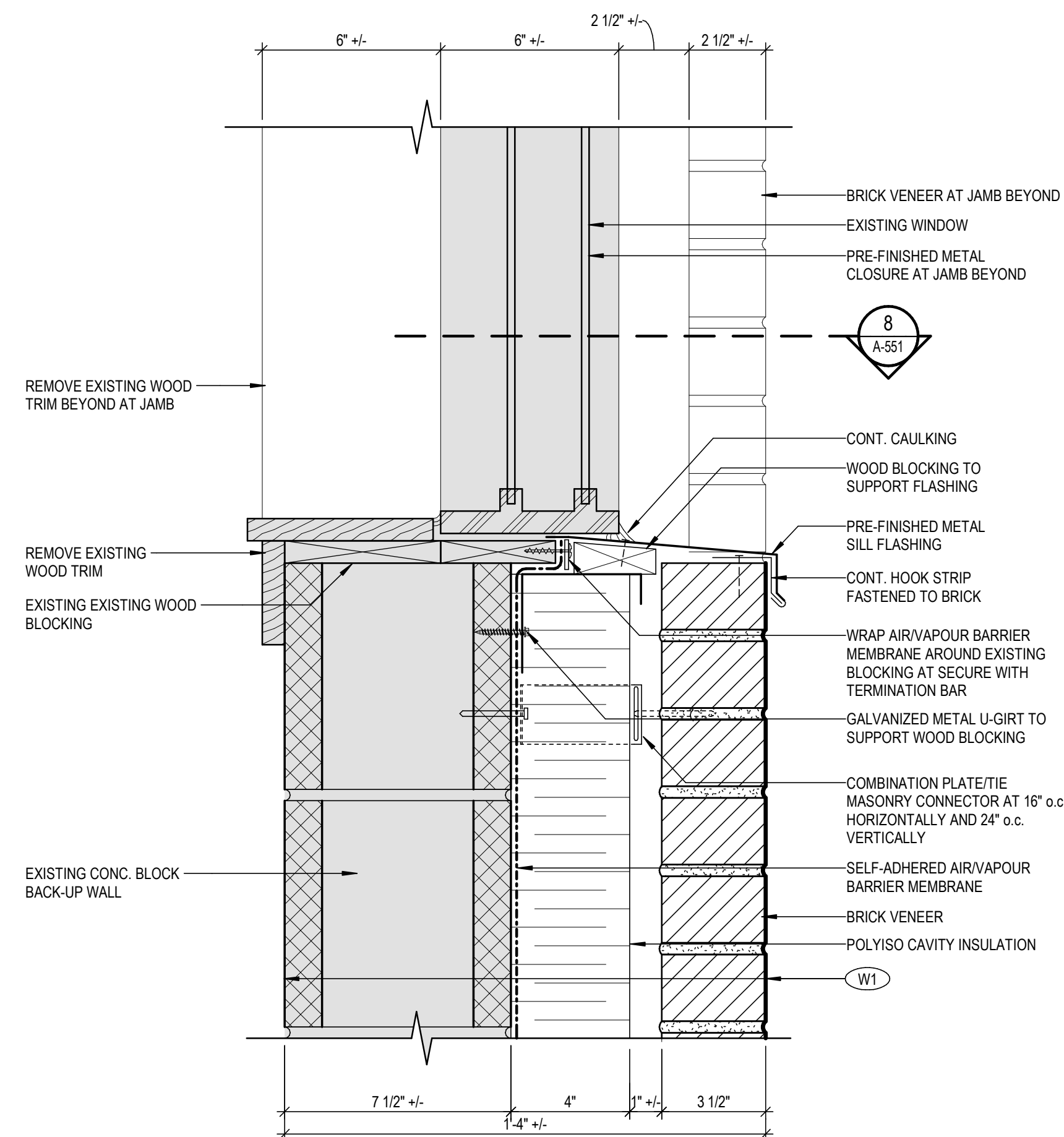
3 EXISTING WINDOW HEAD AT METAL CLADDING (NEW)
A-504 SCALE: 3" = 1'-0"



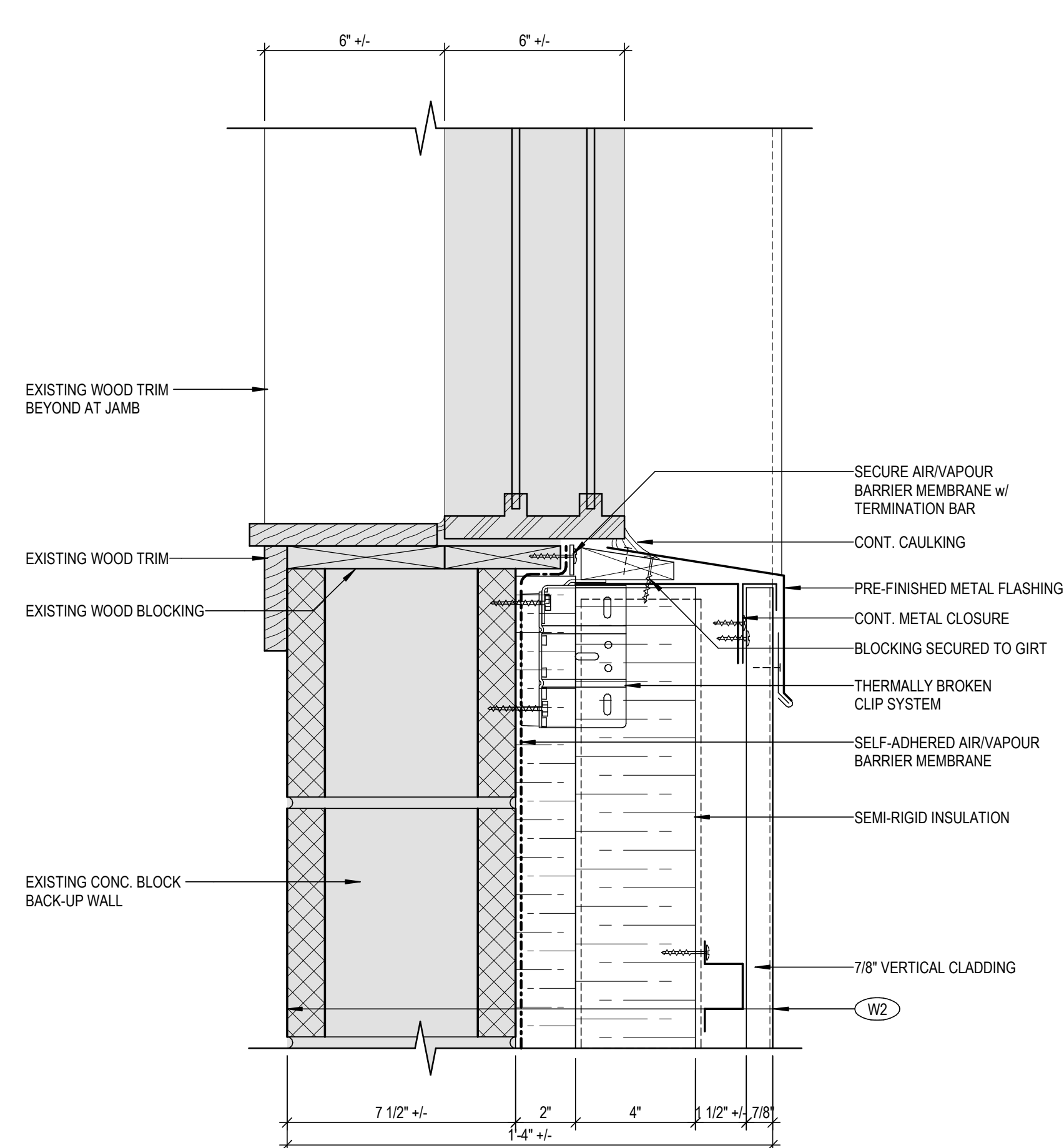
5 LOUVER HEAD AT METAL CLADDING
A-504 SCALE: 3" = 1'-0"



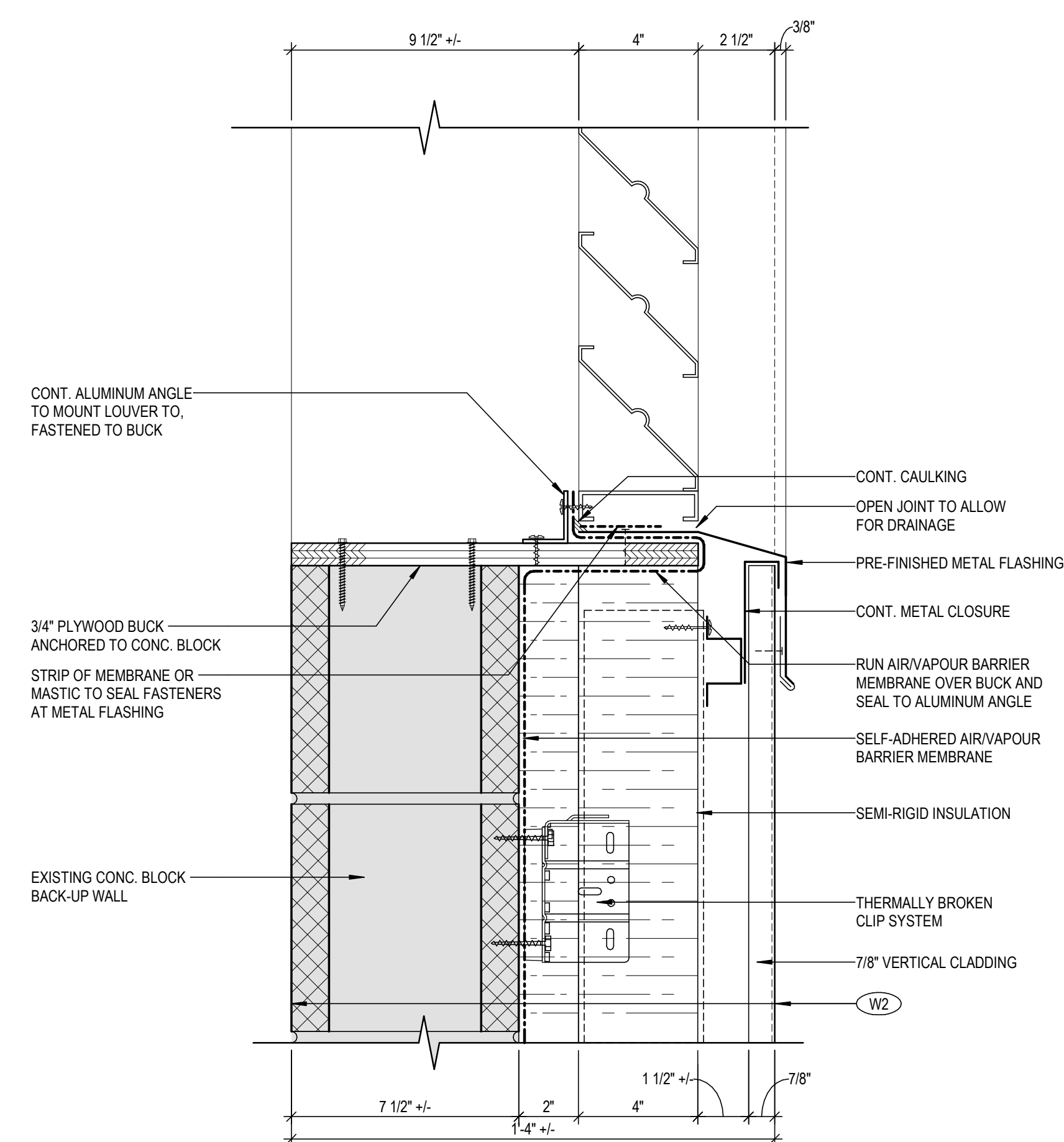
7 METAL CLADDING AT EXISTING SOFFIT
A-504 SCALE: 3" = 1'-0"



2 EXISTING WINDOW SILL AT BRICK VENEER (NEW)
A-504 SCALE: 3" = 1'-0"



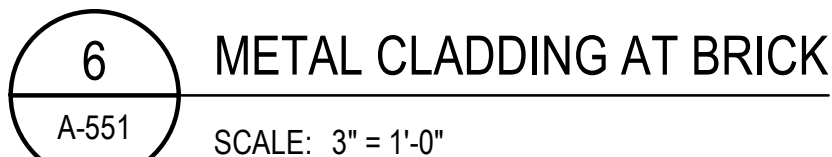
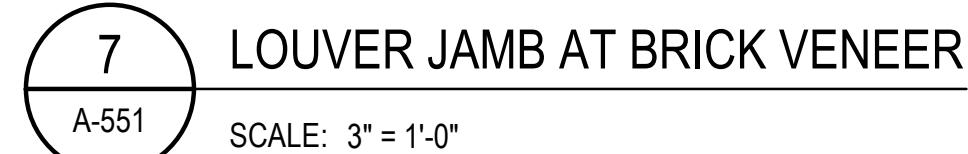
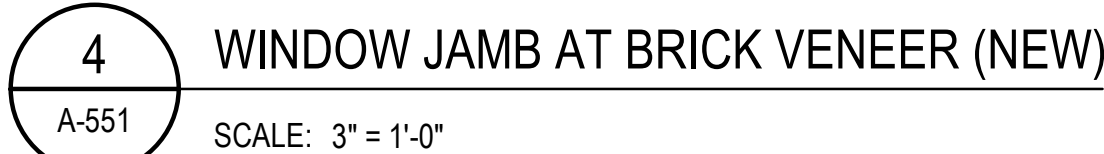
4 EXISTING WINDOW SILL AT METAL CLADDING (NEW)
A-504 SCALE: 3" = 1'-0"

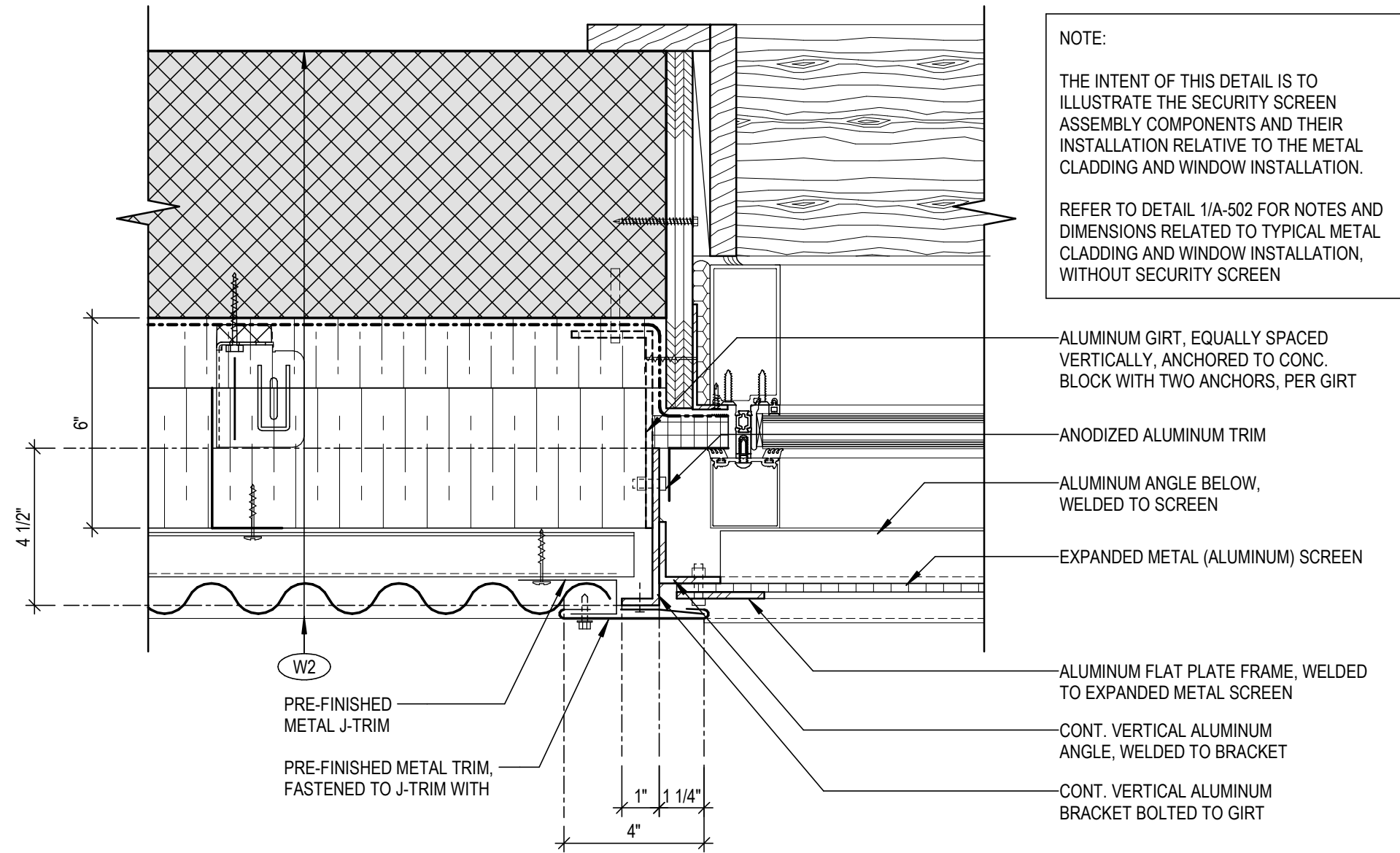


6 LOUVER SILL AT METAL CLADDING
A-504 SCALE: 3" = 1'-0"

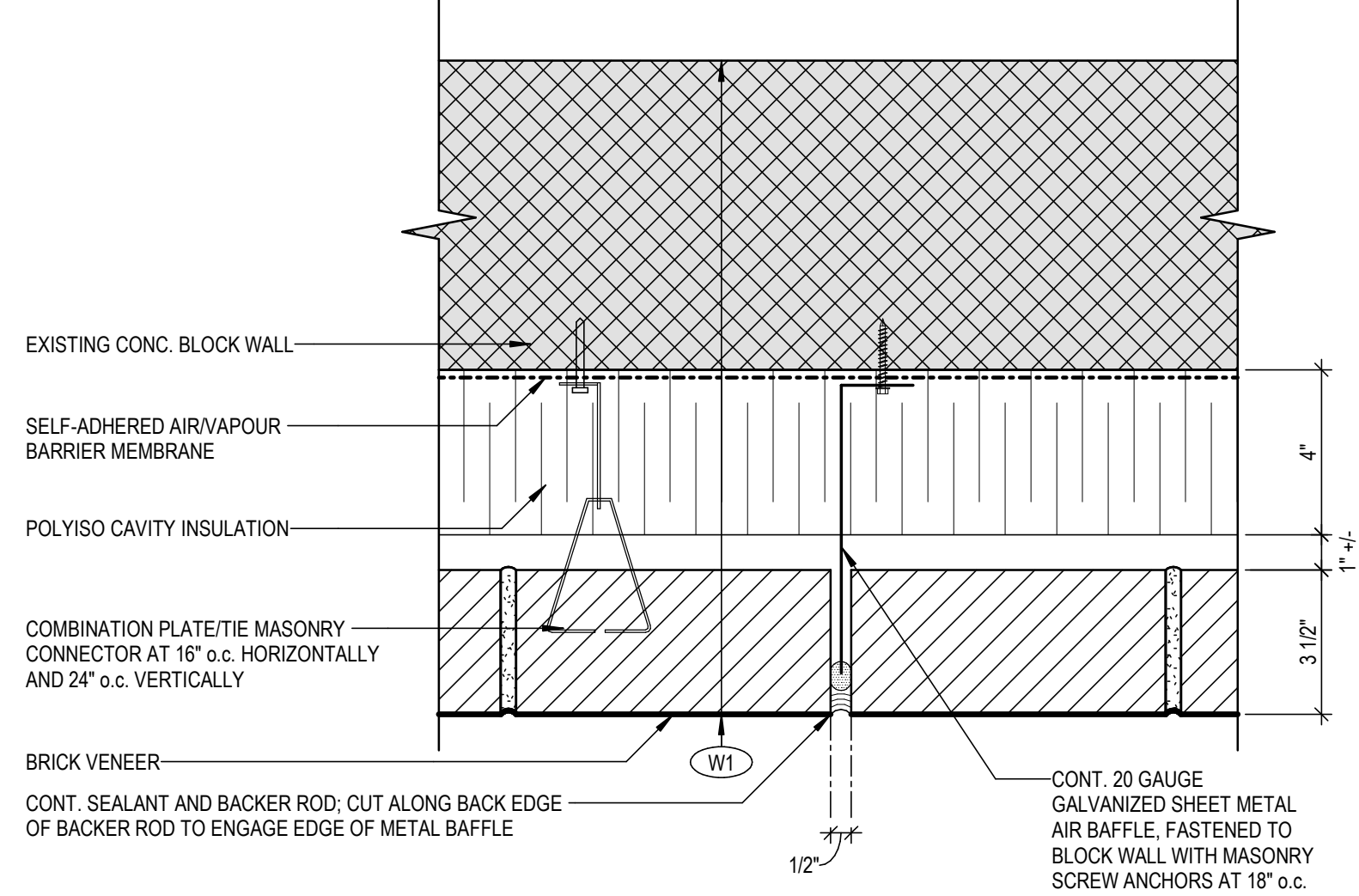
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SCALE	3" = 1'-0"
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CHECKED	SED
DATE	11 SEP 2025
PROJECT	Harrietsfield School - Envelope Renewal
CLIENT	Halifax Regional Centre for Education
PROJECT No.	2025-101
SHEET TITLE	SECTION DETAILS

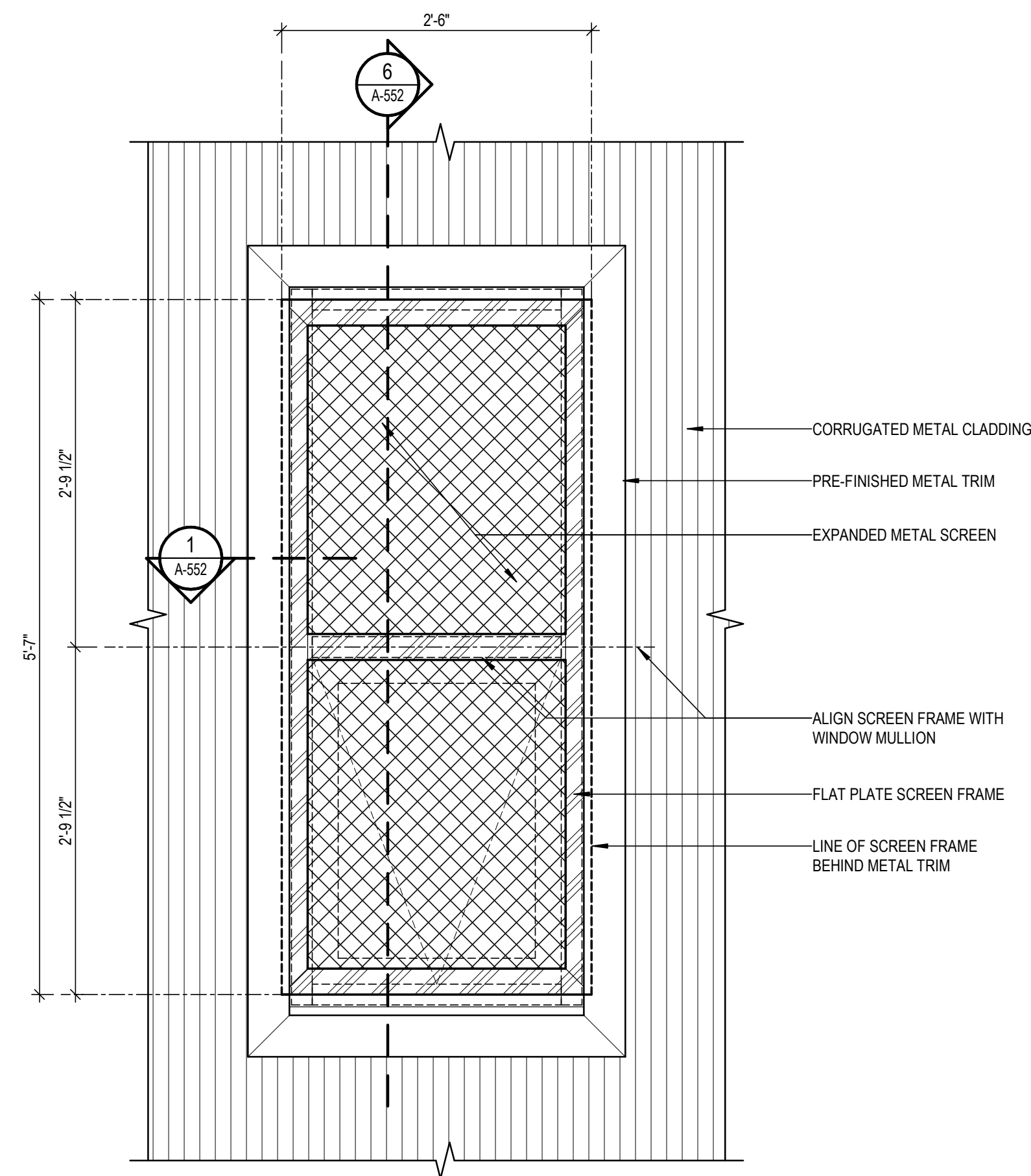




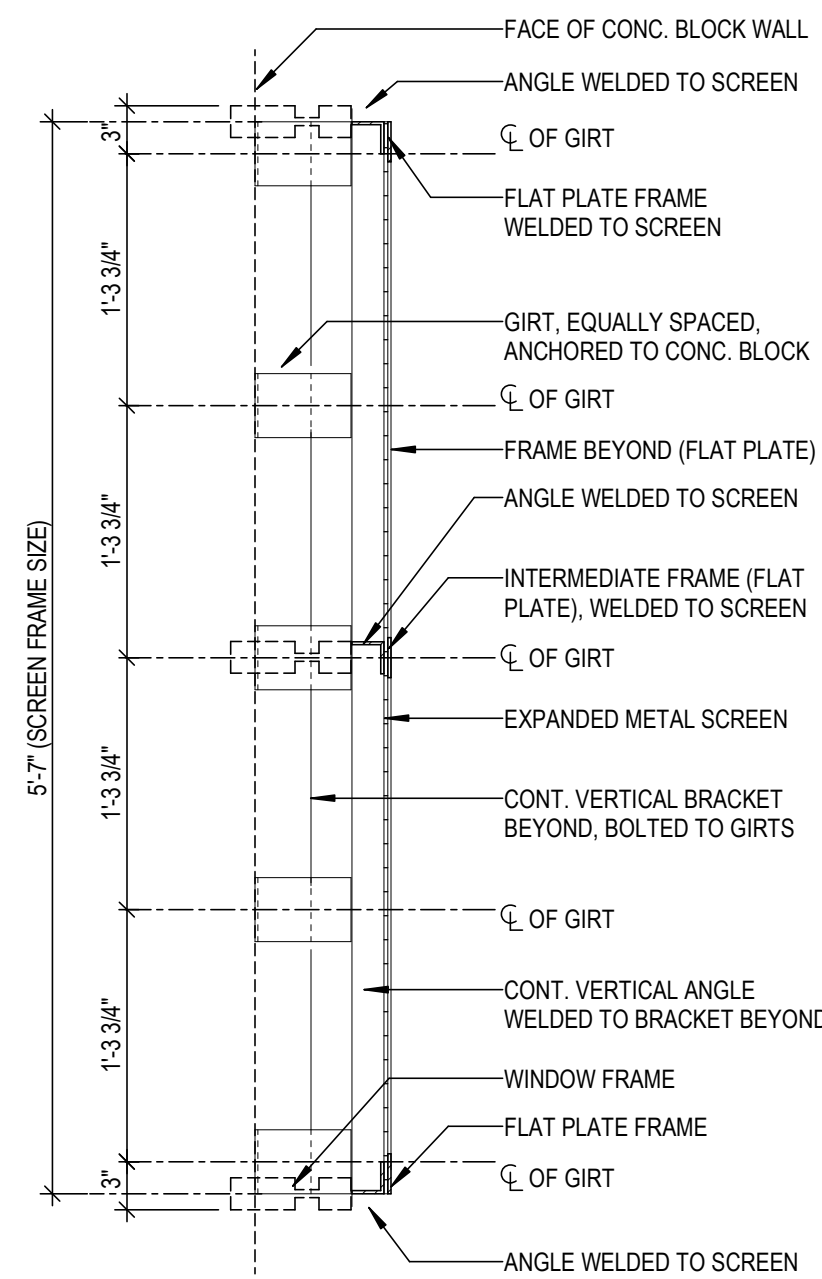
1 PLAN DETAIL AT WINDOW SECURITY SCREEN
A-552 SCALE: 3" = 1'-0"



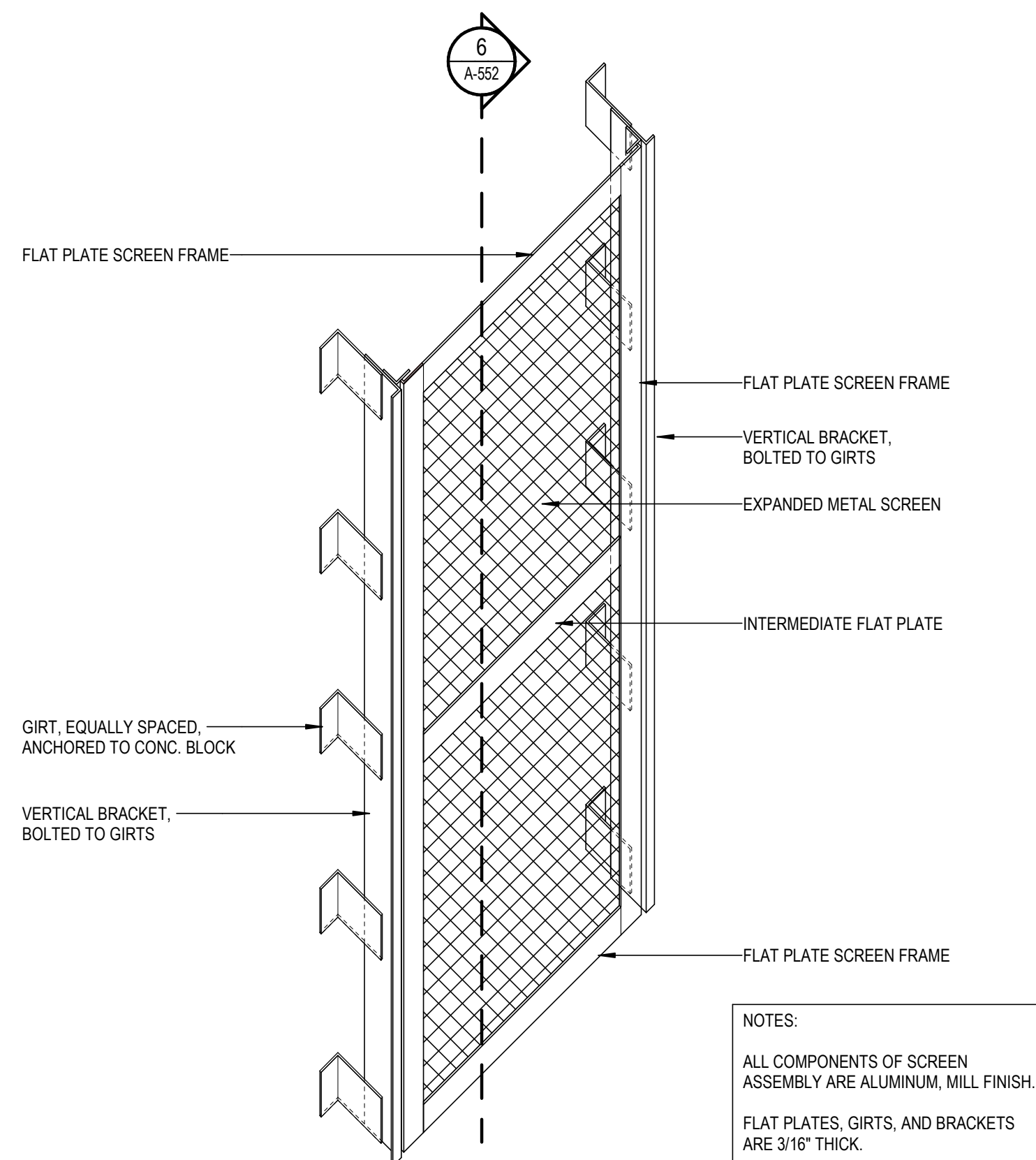
3 PLAN DETAIL AT CONTROL JOINT IN BRICK VENEER
A-552 SCALE: 3" = 1'-0"



5 WINDOW SECURITY SCREEN ELEVATION
A-552 SCALE: 1" = 1'-0"



6 WINDOW SECURITY SCREEN SECTION
A-552 SCALE: 1" = 1'-0"



7 WINDOW SECURITY SCREEN (ISOMETRIC)
A-552 SCALE: 1" = 1'-0"

Halifax Regional
Centre for Education
Hot Work Policy

2018-19 School Year

Rev. 1

Hot Work Permit Follows This Document

Introduction

Hot work comes in a variety of applications each with its own heat source severity. All hot work is a fire hazard that left unmanaged will create high probability conditions for injury and/or property loss. Under the right conditions, hot work heat sources with the lowest temperature ratings can ignite products that seem most difficult to burn.

A hot work management system is required to reduce the risk of hot work causing personal injury and fire or other property damage. The following information is intended to establish the programs and processes designed to manage this risk.

Definition

Hot work is ***any temporary or permanent operation involving open flames or producing heat and/or sparks***. This includes but is not limited to: brazing, cutting, grinding, soldering, torch applied roofing and welding. The definition of hot work can be applied to activities within a facility such as periodic/planned maintenance activities, new construction work and emergency repairs.

Hot work may only be conducted on HRCE premises if authorized by designated Operations Services personnel and only after the following conditions are verified:

1. No other suitable non-hot work means can be found to produce the desired result;
2. No other safe location can be found to do the hot work; and
3. The designated/trained person(s) involved with authorizing and conducting the hot work have complied with all hot work permitting process requirements, including all precautions and required follow-up actions

All employees assigned to perform hot work on HRCE premises will receive the necessary education to be able to accept responsibility for safe, loss-free hot work operations.

Hot Work Management Process

Hot Work Management contains three components:

1. Avoid Hot Work where possible;
2. Prohibit Hot Work where it can not be conducted safely;
3. Conduct Hot Work in areas containing hazards by:
 - relocating the hot work
 - manage hot work by using the hot work permit system described below.

1) Avoid hot work when possible. Consider all alternative methods to hot work. Some alternative methods include:

- Mechanical removal and relocation of frozen piping to a heated area vs. thawing of piping in place with any form of hot work.
- Manual hydraulic shears vs. saw/torch cutting.
- Mechanical bolting vs. welding.
- Screwed or flanged pipe vs. sweat soldering.
- Reciprocating saw vs. radial saw.
- A roof covering system that does not require a hot work process.

2) Prohibit hot work in areas where hot work cannot be conducted safely under any conditions or where extensive preparation and planning are required to make the area and/or equipment involved fire safe. When these conditions exist, the area and/or equipment involved will be designated as a “No Hot Work Area”. Examples of a “No Hot Work Area” include:

- Areas/equipment that contain/handle flammable liquids, flammable gases, combustible dusts, combustible metals and explosives
- Partitions, walls, ceilings or roofs with combustible plastic covering or cores (i.e., expanded plastic insulation, sandwich panels)
- Rubber lined equipment.
- Oxygen enriched atmosphere.
- Storage and handling of oxidizer materials.

Within HRCE schools and worksites, “No Hot Work Areas” include:

- Chemical storage rooms (unless and until all chemicals have been removed from the room);
- Cleaning products storage rooms (unless and until all chemicals have been removed from the room);
- Partitions, walls, ceilings or roofs with combustible plastic covering or cores;

3) When hot work must be conducted in areas or on equipment containing hazardous processes as described above, follow the specific precautions outlined below.

Hot work conducted outside of a designated, fixed hot work station will be managed using a **formal hot work permit system**. Within HRCE, hot work is defined as either “**minor hot work**” or “**major hot work**”, each of which requires a different level of permit and mitigation methods.

Minor Hot Work is defined as hot work which has a low risk of causing injury, fire or property damage because of the method of hot work, tools and equipment used and the materials in or near the hot work area. Designated workers can issue their own permit for conduct of minor hot work.

The hazard assessment on the hot work permit will be used to determine if the work is minor hot work. In most cases, the worker is his/her own “fire watch”. The fire watch is maintained until the material being worked on is cool to the touch at which time an inspection of the work area and adjacent areas is conducted by the worker. While not normally required, the worker may re-inspect the work area or have another employee re-inspect the work area after a period of time if they feel a re-inspection is warranted.

Major Hot Work is defined as hot work where there is a moderate to high risk of injury, fire or property damage because of the method of hot work, tools and equipment used and the materials in or near the hot work area. Workers must be issued a hot work permit by their immediate Supervisor in order to complete major hot work.

The hazard assessment on the hot work permit will be used to determine if the work is major hot work. During major hot work, a fire watch will be posted to give continuous surveillance of the work area. Also, a continuous fire watch will be conducted for the length of time noted on the permit after the work is complete. A re-inspection will occur by the worker or another designated employee at the time indicated on the permit.

Hot Work Permit Process

The following is a step-by-step description of the Hot Work Permit process:

- The worker assigned the task of conducting hot work must complete the hazard assessment which forms the first part of the hot work permit.
- The worker determines if the work is “minor hot work” or “major hot work”. If it is minor hot work, they issue a permit to complete the work. If it is “major hot work”, they will request their immediate Supervisor issue the permit.
- The hot work permit is posted in a visible place within the work area. HRCE employees and supervisors in the area are informed about the hot work activity and the need to support the implemented precautions for this hazardous operation.
- While the hot work proceeds, the fire watch maintains a constant vigil (even during employees breaks and meal times) to maintain the hot work area in a fire-safe condition, keeps watch for any stray sparks, smoldering fires, or other fire hazards, and is ready to provide the initial fire response.
- **Once the work is completed, the fire watch remains in the area for the designated period, as noted: For minor hot work, until material is cool to the touch and area inspected; For major hot work the fire watch remains in place as indicated on the permit. The fire watch must then conduct an inspection, carefully inspecting the work and the adjacent**

areas for smoldering fires. This inspection extends to floors above and below the work and adjacent rooms.

- When work is completed the permit is removed and must be retained as a record of the work.

Fire Watch for “Major Hot Work”

The fire watch should be assigned and initiated when the hot work permit is issued, and this function should be maintained throughout the hot work operation including break/lunch and for the period noted on the permit, continuously following the completion of hot work. A fire watch should be posted and maintained in the immediate area of the hot work and in any adjacent areas that may be exposed by this operation.

The fire watch has responsibility to make sure the hot work area is maintained in a fire-safe condition throughout this work and has the authority to stop the hot work if unsafe conditions are observed. This person must understand the basic hazards of any combustible construction involved with the hot work area, the fire exposure hazard hot work creates to occupancies adjacent to and below the hot work operation, the hazards associated with the occupancy, and the need to maintain proper isolation of all hot work operations from combustible or flammable materials. The fire watch also must be properly trained in use of manual, portable fire extinguishers and emergency notification procedures within the school/worksites.

Second Fire Watches

For any hot work operations on a building roof or adjacent to building walls where a combustible occupancy exists within the structure or the building has any combustible construction, a second fire watch should be posted in the exposed adjacent areas.

For roof level hot work, a second fire watch should be posted on the floor immediately below for roof hot work. Where suspended ceilings are present between the building occupancy and the underside of the structural roof, this space should be inspected periodically during the hot work operation.

Hot work conducted on any building floors and walls or adjacent to building walls with unprotected openings where a combustible occupancy or construction exists on the opposite side, should include assignment of a second fire watch on the opposite side of the wall. This same approach should apply when hot work is conducted on pipe/building shafts, HVAC ductwork, etc.

Fire Prevention Measures

Based on the Hot Work Permit System, implement hot work fire prevention precautions as follows for **minor hot work**:

- Maintain automatic sprinkler protection and other fixed fire protection systems in service and fully operational.
- Provide manual firefighting equipment appropriate for the construction/occupancy hazards in the hot work area.
- Maintain hot work equipment in good repair.
- Separate hot work operations from combustibles using fire resistive blankets or screens to properly isolate the hot work from the adjacent combustible materials.
- The following fire safety precautions listed on the Hot Work Permit apply to the surface area within 35 ft (11 m) of the hot work. The major purpose is to isolate fuels from sparks. Within this area:
 - a) Sweep floors clean, removing any spilled grease or oil
 - b) Remove any flammable materials (wood, cardboard, etc) or liquids (paints, oils and lacquers) from the hot work area.
 - c) Protect combustibles that cannot be moved with fire resistive tarpaulins or metal shields
- Hot work is prohibited on partitions, walls, ceilings or roofs with combustible plastic coverings or cores (i.e., expanded plastic insulation, sandwich panels).
- Schedule hot work during shutdown periods if possible.

Based on the Hot Work Permit System, implement hot work fire prevention precautions as follows for **major hot work**:

- Maintain automatic sprinkler protection and other fixed fire protection systems in service and fully operational.
- Provide manual firefighting equipment appropriate for the construction/occupancy hazards in the hot work area.
- Maintain hot work equipment in good repair.
- Separate hot work operations from combustibles by a minimum of 35 ft (11 m) of open space from grade level hot work areas. An alternative is to use proper fire resistive welding blankets and screens to properly isolate the hot work from the adjacent combustible occupancies.
- The following fire safety precautions listed on the Hot Work Permit apply to the surface area within 35 ft (11 m) of the hot work. The major purpose is to isolate fuels from sparks. Within this area:
 - a) Sweep floors clean, removing any spilled grease or oil. Cover floors made of combustible material (i.e., boards on joist, plank on steel, wood block) with fire-resistant tarpaulins or other noncombustible material.
 - b) Remove any flammable liquids (paints, oils and lacquers) from the hot work area.

- c) Protect combustibles that cannot be moved with fire resistive tarpaulins or metal shields. This includes all storage or machinery with grease or lint deposits. Hot work blankets used to cover combustible materials or construction that cannot be relocated from the hot work area should always be “tented”.
 - d) Cover all wall and floor openings. Plug floor openings with an approved fire stop material. Seal ductwork and duct openings with metal covers or cover them with fire-resistive tarpaulins. Close all doors and fire doors to prevent sparks from escaping.
- Either eliminate explosive atmospheres (dust or vapor) or prohibit the hot work. Shut down any process that produces explosive atmospheres, and continuously monitor the area for accumulation of combustible gases before, during and after hot work. Prohibit hot work where accumulations of volatiles or combustibles are severe and cannot be eliminated.
- Prohibit hot work on partitions, walls, ceilings or roofs with combustible plastic coverings or cores (i.e., expanded plastic insulation, sandwich panels).
- Schedule hot work during shutdown periods if possible.
- Secure, isolate and vent pressurized vessels, piping and equipment as needed prior to initiating hot work. Clean combustible and/or flammable liquids, gases and solids whenever present within the equipment, prior to initiating hot work.
- For hot work on vessels or boilers, use only contractors who are qualified by a nationally or internationally recognized boiler and pressure vessel code.
- Assign a designated fire watch to the hot work operation before this work is started. Maintain a continuous fire watch during the hot work activity, throughout all break and lunch periods, and for at least one hour following the completion of the hot work. Beyond this, monitor the area for up to an additional 3 hours, depending on local conditions.
- Avoid hot work of any kind in areas handling, **processing or storing flammable liquids or gases**. Hot work provides an ignition source in an area where fuel is available in significant quantities and in a readily ignitable form. Ideally, relocate any hot work operation within a flammable liquid or gas occupancy to a non-hazardous location. When relocation is not possible, the following additional precautions should be implemented:
 - a) Drain all equipment or piping in the area of flammable and combustible liquids.
 - b) Steam clean equipment or pipe to be worked on or provide with an inert atmosphere, to prevent creation of a flammable atmosphere.
 - c) Shut off pipe supplying the area with flammable and combustible liquids off at the source (valve should be locked shut to prevent unexpected opening). If the piping is to be worked on, blank if off.

- d) Check equipment or piping with a portable oxygen analyzer before and during the hot work. This is to ensure that sufficient oxygen to support combustion is not present inside the equipment or piping.
- e) Protect all permanent storage tanks or piping (that cannot be moved or drained) against physical contact and heat from hot work equipment. Preferably all equipment that is within reach of the hot work equipment (grinder, welding rod holder, cutting torch, etc.) will be drained, purged and made inert. If this is not possible due to the quantities of flammable liquids involved, provide physical protection for closed flammable liquid equipment by placing welding curtains and temporary barriers between the equipment and the hot work. Carefully review the area to ensure that no vents or other opening are near the hot work that could allow fumes to come into contact with any sparks or hot surfaces.
- f) Keep mechanical exhaust ventilation in the room/building in operation.
- g) Use a portable combustible gas analyzer before and during the work. If any detectable readings are obtained, then work cannot begin or continue until the source is found and suitably mitigated such that the concentration is maintained below 10% of the LFL.

Alternative to the 35 ft (11 m) Rule

An alternative to the 35 ft (11 m) rule is to physically isolate the hot work operation from adjacent combustible occupancies or construction using properly fire rated hot work shields and/or blankets. “Boxing” the hot work operation can be accomplished through vertically suspending hot work shields or blankets around the hot work extended at least 15 ft (4.6 m) above the highest elevation of the hot work or to the bottom of a solid/smooth ceiling/roof and extending to floor.

When “boxing” is used in buildings with structural members that create an open space between the top of the member and the floor or roof above, this space should be sealed to prevent liberation of sparks/spatter/slag through the open space. The lower elevation of the “boxing” materials should overlap onto the floor at least 6 in. (152 mm) and this layer should be constructed of a noncombustible, fire resistive hot work blanket material. The process of “boxing” the hot work hazard requires a proper understanding of the limitations of the hot work shields or blankets being used.

Hot work shields or screens should be used only as vertical barriers for hot work operations. Where these shields or screens are required to extend onto the floor in the hot work area, the bottom 2 ft (0.6 m) of the screen should be constructed of noncombustible hot work blanket material. ***Hot work shields or screens are typically constructed of translucent plastic materials that are combustible and will fail under extended exposure to severe hot work in positions other than a vertical position.***

Where severe hot work (torch cutting, arc stick welding) will be conducted and the area beneath this activity needs to be protected against the hot work, hot work pads should be provided.

Elevated Hot Work

For elevated hot work, combustible materials should be either relocated a minimum of 50 ft (15.2 m) from the hot work area; or properly protected with fire retardant welding blankets; or the hot work operation isolated with welding screens. Suspend fire-resistive welding blankets under hot work conducted near the ceiling. Place noncombustible screens around hot work at the floor to trap sparks. Every elevated hot work operation needs to be evaluated on a case-by-case basis to determine a reasonable safe distance from hot work to combustible occupancies or construction. The physical conditions involved may dictate relocation of combustibles beyond 50 ft (15.2 m).

Outside Contractors

Many hot work operations are performed by outside contractors; these include cutting, welding, joint soldering, paint removal, roofing, etc. When outside contractors are involved, the risk of fire may increase simply because contractors may not understand the hazards at the school/worksites.

Contractors working for HRCE, and conducting hot work, must have their own Hot Work Permit/Management System that provides equal or greater risk mitigation than those methods and procedures mention herein.

Contractors must inform HRCE when hot work will be conducted at any of our schools/worksites.

HOT WORK PERMIT

STOP!

Avoid hot work when possible! Consider using an alternative cold work method.

This Hot Work Permit is required for any temporary operation involving open flames or producing heat and/or sparks conducted outside a Hot Work Designated Area. This includes, but is not limited to: brazing, cutting, grinding, soldering, torch-applied roofing and welding.

Instructions for Permit Authorizer

1. Specify the precautions to take.
2. Fill out and keep **Part 1** during the hot work process.
3. Issue **Part 2** to the person doing the job.
4. Keep **Part 2** on file for future reference, including signed confirmation that the post-work fire watch and monitoring have been completed.
5. Sign off the final check on **Part 2**.

HOT WORK BY

- ☐ Employee
☐ Contractor _____

DATE

JOB NUMBER

LOCATION OF WORK (BUILDING/FLOOR/OBJECT)

WORK TO BE PERFORMED

NAME OF PERSON PERFORMING HOT WORK

NAME OF PERSON PERFORMING FIRE WATCH

I verify the above location has been examined, the Required Precautions have been taken, and permission is authorized for this work.

PERMIT AUTHORIZER (PRINT AND SIGN)

THIS PERMIT EXPIRES ON (LIMIT AUTHORIZATION TO ONE SHIFT):

DATE:

TIME:

AM/PM

Note: Emergency notification on back of form.

Additional FM Global Resources:

Property Loss Prevention Data Sheet 10-3, *Hot Work Management*
Hot Work Permit App via fmglobal.com/apps
Hot Work Permit form (F2630) via fmglobalcatalog.com
Online training at training.fmglobal.com
FM Approved equipment via fmapprovals.com

Part 1

Y NA

- ☐ ☐ The fire pump is in operation and switched to automatic.
☐ ☐ Control valves to water supply for sprinkler system are open.
☐ Extinguishers are in service/operable.
☐ Hot work equipment is in good working condition.

Requirements within 35 ft. (10 m) of hot work

- ☐ ☐ Shield combustible construction using listed (e.g., FM Approved) welding pads, blankets and curtains.
☐ ☐ Remove or shield nonremovable combustibles using listed (e.g., FM Approved) welding pads, blankets and curtains.
☐ ☐ Isolate potential sources of flammable gas, ignitable liquid or combustible dust/lint (e.g., shut down equipment).
☐ ☐ Remove ignitable liquid, combustible dust/lint and combustible residues.
☐ ☐ Shut down ventilation and conveying systems.
☐ ☐ Remove combustibles and consider a second fire watch on opposite side of floor, wall, ceiling or roof when openings exist or thermally conductive materials pass through.
☐ ☐ Is work on a combustible building assembly (e.g., Torch-Applied Roofing)? If yes, provide **ADDITIONAL REQUIRED PRECAUTIONS** below.

Hot work on/in closed equipment, ductwork or piping

- ☐ ☐ Isolate equipment from service.
☐ ☐ Remove ignitable liquid and purge flammable gas/vapor.
☐ ☐ Prior to work, and/or during work, monitor for flammable gas/vapor. LEL reading(s): _____
☐ ☐ Remove combustible dust/lint or other combustible materials.
☐ ☐ Is work on/in equipment with nonremovable combustible linings or parts? If yes, provide **ADDITIONAL REQUIRED PRECAUTIONS** below.

Fire watch/fire monitoring the hot work area

Times listed are sufficient for majority. Use Table at back of permit for guidance for combustible concealed cavities, roof work or favorable factors.

- ☐ Perform a continuous fire watch during hot work.
☐ Perform a continuous fire watch post-work for
☐ 1 hour or Other ____ hours.
☐ ☐ Perform fire monitoring for
☐ 3 hours or Other ____ hours.

ADDITIONAL REQUIRED PRECAUTIONS:

FM Global

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Halifax
Regional Centre for Education