

Request for Tender RFT 21-116

School Renovations at John T. Tuck Public School

Closing Date: April 7, 2021

Closing Time: 2:00 p.m.

Sealed RFTs will be received via email to chatelaina@hdsb.ca on or before 2:00 p.m., Eastern Daylight Time

Late or Facsimile Bids will not be considered

March 17, 2021

Amanda Chatelain, CPPB Senior Officer – Purchasing

Communications Notice

To obtain documents online please visit: <u>https://hdsb.bidsandtenders.ca</u>

If you subscribe to bids & tenders you can login to your account to download the document(s) without the preview watermark. You may also opt to purchase a one-time download for this opportunity. <u>Documents are not provided in any other manner.</u>

All proponents shall be registered as a Plan Taker for this opportunity, which will enable the proponent to download the Request for Proposal (RFP) without the watermark preview, to receive addenda email notifications, and to download addenda.

Should the HDSB receive a proposal that is subsequently found to be from a bidder that is not registered with bids & tenders and the bidder did not obtain the proposal document from https://hdsb.bidsandtenders.ca the HDSB reserves the right to remove the proposal from further consideration.

To ensure receipt of the latest information and updates via email regarding this opportunity, the onus is on the proponent to register as a Plan Taker for this opportunity at <u>https://hdsb.bidsandtenders.ca</u>.

The following documents form part of all HDSB competitive proposal documents:

HDSB Procurement Administrative Procedure:

https://www.hdsb.ca/our-board/Policy/Procurement.pdf

HDSB Asbestos Management in Facilities Administrative Procedure:

https://www.hdsb.ca/our-board/Policy/AsbestosManagementInFacilities.pdf

HDSB Vendor Performance Management Administrative Procedure:

https://www.hdsb.ca/our-board/Policy/VendorPerformanceManagement.pdf

Broader Public Sector Procurement Directive

https://www.doingbusiness.mgs.gov.on.ca/mbs/psb/psb.nsf/Attachments/001-BPS_Procurement_Directive/\$FILE/BPS_Procurement_Directive.pdf

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Part A – Outline and Instructions

1. Introduction and Board Profile

The Halton District School Board is composed of approximately 104 school locations (86 elementary and 18 secondary schools). These locations service approximately 64,300 regular day school students (Junior Kindergarten to Grade 12). The Board employs approximately 6,600 employees. Please visit our website <u>http://www.hdsb.ca</u> for additional information.

2. General Terms of the RFT

The Halton District School Board, hereinafter referred to as HDSB, is seeking qualified Contractors to complete an School Renovations at John T. Tuck Public School located at 3365 Spruce Ave, Burlington, ON L7N 1J7, in accordance with the drawings and specifications provided. Specific details of the RFT are to be found in the attached Scope of Work.

3. Bid Security and Bonding Requirements

Any bid submission equal to or greater than \$500,000, must be submitted with a Bid Bond in the value of ten percent (10%) of the Total Cost and a Surety Consent in favour of the Halton District School Board. The Surety Consent shall cover a Performance Bond and a Labour & Materials Payment bond, each in the amount of fifty percent (50%) of the contract price as a guarantee that the Bidder shall execute the contract upon award.

The Bid Security so submitted shall be irrevocable and valid for 90 from closing date set for the submission of tender.

In order to be considered for award of a contract equal to or over \$500,000, the Bidder shall submit as part of their Submission, a Surety Consent, completed by a Bonding Company. Any others will not be accepted.

Upon receipt of written notice from the Halton District School Board that it has been awarded the Contract, the successful Bidder shall provide, within five (5) working days of such notice, an original Performance Bond and a Labour and Material Payment Bond, each for the amount of fifty per cent (50%) of the total lump sum price, to guarantee the performance of all obligations of the Contract.

4. RFT Closing Information

Bidders must submit their Submission <u>via email</u> on or before 2:00 p.m., Eastern Daylight Time on **April 7, 2021** (the "Closing Time") to the following address:

chatelaina@hdsb.ca Attention: Amanda Chatelain

Submissions will be deemed to be officially received by the time stamp issued by the HDSB's email server. Submissions received after the official closing time will be declared non-compliant and shall not be considered during the selection process. Electronic submission shall be no larger than 25MB. Proponents are responsible for confirming that their submission has been successfully received.

5. Accuracy of Information/Liability for Errors or Omissions

While the HDSB has used considerable efforts to ensure an accurate representation of information in this document, the information contained in it is supplied solely as a guideline for Bidders. Any data contained in this RFT or provided by way of Addenda are estimates only and are for the sole purpose of indicating to the Bidder the general size of what is being requested hereunder. The information is not guaranteed or warranted to be accurate by the HDSB, nor is it necessarily comprehensive or exhaustive. Nothing in this document is intended to relieve Bidders from forming their own opinions and conclusions with respect to the matters addressed in this RFT. It is the Bidder's responsibility to avail itself of all the necessary information to prepare a Submission in response to this RFT.

6. Communication After RFT Issuance

All Communications regarding any aspect of this RFT <u>must be submitted via Bids and</u> <u>Tenders.</u>

Bidders that fail to comply with the requirement to direct all communications to the RFT Authority via Bids and Tenders may be disqualified from this RFT process. Without limiting the generality of this provision, Bidders shall not communicate with or attempt to communicate with the following as it relates to this RFT:

- any employee or agent of the HDSB, other than the RFT Purchasing contact;
- any member of the HDSB governing body including, without limitation, the director, officers, trustees, superintendents, and any advisors thereto;

Bidders shall promptly examine this RFT and all Appendices, including the Form of Tender, and:

- shall report any errors, omissions or ambiguities; and
- may direct questions or seek additional information on or before the Deadline for Questions to the RFT Purchasing contact.

It is the responsibility of the Bidder to seek clarification, by submitting questions to the RFT Authority via Bids and Tenders, on any matter it considers to be unclear. The HDSB shall not be responsible for any misunderstanding on the part of the Bidder concerning this RFT or its process.

In the event a Bidder has any reason to believe that an error, omission or ambiguity exists, the Bidder must notify the RFT Authority via Bids and Tenders prior to submitting a Proposal.

If appropriate, the RFT Authority will then clarify the matter for the benefit of all Bidders by publication on the same public platform, its website or by notice to Bidders who have requested a copy of this RFT in the same manner as set out in section 6 below.

In answering a Bidder's questions, the HDSB will set out the question, without identifying the Bidder that submitted the question, and the HDSB may in its sole discretion:

- edit the question for clarity;
- answer similar questions from various Bidders only once.

Where an answer results in any change to the RFT, such answer will be formally evidenced through the issue of a separate addendum for this purpose.

7. Addenda

If the HDSB for any reason, determines that it is necessary to provide additional information relating to this RFT, such information will be communicated to all Bidders by addendum in the same manner the RFT was communicated. Each Addendum shall form an integral part of this RFT. This RFT may only be amended in accordance with this section.

All questions related to this Tender must be submitted in writing via bids and tenders prior to 2 p.m. on March 26, 2021. Any addendum will be posted no later than March 30, 2021.

Any amendment or supplement to this RFT made in any other manner will not be binding on the HDSB.

All Addenda shall become an integral part of this RFT and shall be incorporated into any content. Each Bidder shall be responsible for verifying before depositing its Proposal that it has received all Addenda that have been issued.

Event	Date
Release of RFT	March 17, 2021
Non-Mandatory Site Meeting	March 24, 2021

8. Planned Schedule of Events – Project Schedule

Question Deadline	March 26, 2021
Issuance of Final Addendum	March 30, 2021
RFT Closing	April 7, 2021
Project Timelines for Completion	August 2, 2021 – August 27, 2021

9. Bidder's Costs

Bidders shall bear all costs and expenses incurred relating to any aspect of its participation in this RFT process, including all costs and expenses relating to the Bidder's participation in:

- the preparation, presentation and receipt of its Submission;
- the Bidders attendance at any meeting in relation to the RFT process, including any presentation or interview;
- the conduct of any due diligence on its part, including any information-gathering activity;
- the preparation of the Bidder's own questions prior to the Deadline for Questions; and
- any discussion and/or finalization, if any, in respect of the Form of Agreement.

10. Bidding Format

Unless otherwise specified in these RFT documents or the final contract entered into between the HDSB and the successful Bidder, responses shall be for a stipulated sum without escalator clauses or other qualifications (when applicable). Bidders submitting a bid with escalator clauses or other qualifications that are not in accordance with the terms and conditions of this RFT may have their bid rejected.

All information entered on this RFT document must be type written or entered in ink. No pencil entries will be accepted.

Erasure(s), overwriting or strike-out(s) must be initialed in ink by the person signing this Submission.

Respondents will use the following format for their submission:

• Form of Tender (<u>complete</u> form must be included with your submission, including bonds and any other information as may be required herein)

• Appendix A - Signed Declaration Sheet (must be included with your submission)

11. Pricing

Please do not add tax to base (unit) price. (when applicable). Early payment discounts may be considered part of the Submission. Credit Card payment acceptance may be considered part of the Submission.

12. Subcontractors

The General Contractor must select a subcontractor from the HDSB pre-qualified list of sub-contractors attached in Appendix B.

The Contractor agrees to preserve and protect the rights of the parties under the contract with respect to work performed under subcontract, and shall:

• enter into contracts or written agreements with their subcontractors to require them to perform their work in accordance with and subject to the terms and conditions of the contract. Further, the Contractor shall be fully responsible to the Owner for acts and omissions of their subcontractors and of any persons directly or indirectly employed by them as for acts and omissions of persons directly employed by them.

• therefore agree that they will incorporate the terms and conditions of the Contract Documents into all Subcontractor Agreements they enter into with their subcontractors. The HDSB reserves the right, at its discretion to waive the requirement to utilized the mandatory list of pre-qualified sub-trades at any time during the tendering process based on market conditions.

13. Non-Mandatory Site Meeting

There will be a Non-Mandatory Site Meeting starting on March 24 2021 at the main office of John T. Tuck Public School located at 3365 Spruce Ave, Burlington, ON L7N 1J7. The Site Meeting will start at 4:00 p.m.

Bidders must follow all HDSB and public health Covid-19 guidelines while on HDSB sites.

Part B – Standard Terms and Conditions

14. Scope

Unless otherwise expressly stated these Standard Terms and Conditions form a part of this document and apply in like force to contracts for the purchase of commodities as stated in this document. All Bidders will be bound by the terms and conditions set forth, except as specifically qualified in Special Terms and Conditions issued in connection with this document or any Addenda issued relating to this document.

15. Definitions

As used herein as well as in all RFSQ, RFQ, RFP, RFI, Tender or contract documents issued by the Halton District School Board, the following definitions will apply.

Addenda/Addendum	an addition/change made to this document, subsequent to its printing or publication.
Applicable Law and Applicable Laws	means any common law requirement and all applicable and enforceable statutes, regulations, directives, policies, administrative interpretations, orders, by-laws, rules, guidelines, approvals and other legal requirements of any government and/or regulatory authority in effect from time to time.
Bid/Submission/Proposal	an offer from a Bidder in response to a Proposal/Tender which is subject to acceptance or rejection.
Proponent	a legal entity, being a company, partnership or individual who submits a Bid, Proposal, or Submission in response to a formal request for Bid, Proposal, or Submission.
Board/HDSB	means the Halton District School Board.
Contract	means the agreement, in writing, governing the performance of the Work and/or the purchase and sale of commodities and includes, without limitation, the document (including standard terms and conditions), Bidder Submission and the written document accepting the Bidder Submission (including any notice of acceptance or award).
Document	means the document describing the Goods and/or Services to be purchased and the terms upon which the Goods and/or Services are to be purchased and

	includes, without limitation, those documents referenced on the index of the document and such Addenda as may be issued by the HDSB.
Goods or Services	product and/or any and all labour, vehicles or equipment used by a Bidder in fulfilling a Contract.
HST	means Harmonized Sales Tax.
Intellectual Property	means any trademark, copyright, moral right, patent, industrial design, trade name, domain name, trade secret, know how, integrated circuit topography or other intellectual property, industrial property or proprietary right owned by, licensed to, or used by any third person.
Mandatory Requirement	a minimum requirement – where the words "mandatory", "must", "required", "shall" and/or "will" are referenced in this document and such requirement is identified as a Mandatory Requirement. Failure to comply will deem the submission non-compliant and the bid/submission will be disqualified.
Proposal/RFP	a sealed written offer to supply Goods and/or Services of any value, acceptance of which may be subject to negotiation.
Quotation/RFQ	a written offer to supply Goods and/or Services with a value that is less than \$100,000.
Response	the package submitted by a Bidder in response to an RFP or RFT.
Specifications	those stated requirements for the Goods and/or Services set out in the document.
Subcontractor	a person, firm or corporation having a direct contract with the contractor to perform a part or parts of the Work, or to supply Goods worked to a special design according to the contract documents, but does not include one who merely supplies Goods not so worked.
Tender/RFT	a sealed written offer to supply Goods and/or Services with a value that is greater than \$100,000.
Bidder Submission	means the document as completed by the Bidder for the purpose of offering to sell to the HDSB the services

	and/or goods specified in the document, and includes but is not limited to Quotations, Tenders and Proposals.
Work	means the Work to be undertaken by the Bidder pursuant to the provisions of the Contract.

16. Reserved Rights of the HDSB

The HDSB reserves the right to:

- (a) make public the names of any or all Bidders;
- (b) request written clarification or the submission of supplementary written information in relation to the clarification request from any Bidder and incorporate a Bidder's response to that request for clarification into the Bidder's Submission;
- (c) assess a Bidder's Submission on the basis of:
 - (i) a financial analysis determining the actual cost of the Submission when considering factors including quality, service, price and transition costs arising from the replacement of existing goods, services, practices, methodologies and infrastructure (howsoever originally established);
 - (ii) information provided by references;
 - (iii) the Bidder's past performance on previous contracts awarded by the HDSB;
 - (iv) the information provided by a Bidder pursuant to the HDSB exercising its clarification rights under this RFT process; or
 - (v) other relevant information that arises during this RFT process;
- (d) waive formalities and accept Submissions that substantially comply with the requirements of this RFT;
- (e) verify with any Bidder or with a third party any information set out in a Submission;
- (f) check references other than those provided by any Bidder;
- (g) disqualify any Bidder whose Submission contains misrepresentations or any other inaccurate or misleading information;
- (h) disqualify any Bidder or the Submission of any Bidder who has engaged in conduct prohibited by this RFT;

- (i) disqualify a Bidder for any conduct, situation or circumstance that constitutes a Conflict of Interest, as solely determined by the HDSB and at any time.
- (j) make changes, including substantial changes, to this RFT, provided that those changes are issued by way of addenda in the manner set out in this RFT;
- (k) select any Bidder other than the Bidder whose bid reflects the lowest cost to the HDSB;
- (I) review all Bidders utilizing the HDSB Vendor Performance Management Administrative Procedure, which can include suspension of Bidders who fail the meet the HDSB's expectations or who are involved in litigation or threatened litigation against HDSB. The HDSB Vendor Performance Management Administrative Procedure is found at the attached link

(www.hdsb.ca/our-board/Policy/VendorPerformanceManagement.pdf)

- (m) award to one or more bidders according to their requirements;
- (n) cancel this RFT process at any time and for any or no reason;
- (o) cancel this RFT process at any stage and issue a new RFT for the same or similar deliverables;
- (p) accept any Submission in whole or in part; or
- (q) award to multiple bidders if circumstances are warranted;
- (r) reject any or all Submissions;
- (s) to limit the number of pre-qualified Bidders eligible to submit proposals for any future projects. HDSB shall not be obligated to provide all pre-qualified Bidders with the same opportunity to bid on all future projects within each stated category. By participating in this RFT, Bidders acknowledge that there is no guarantee that a Bidder will receive any assignments, work or projects and that there is no expectation that any specified number of projects will be made available during the pre-qualification term;

and these reserved rights are in addition to any other express rights or any other rights that may be implied in the circumstances.

In addition, the HDSB reserves the right at any time during normal business hours, and as often as the HDSB may deem necessary, to examine, the successful Bidder's records with respect to the successful Bidder's services under the Bidder's purchase order and/or Submission and any Contract. The successful Bidder shall permit the HDSB to audit, examine, and make copies, excerpts or transcripts from such records, and to make audits

of data relating to matters covered by a Submission, any purchase order and/or any Contract. The successful Bidder shall maintain and retain all records and other documents related to a Submission, any purchase order, and/or any Contract for a period of seven (7) years from the date of final payment, except in cases where unresolved audit questions require a longer period of time for resolution, as determined by the HDSB.

17. Litigation with the HDSB

The HDSB may, in its absolute discretion, reject a Submission submitted by a Bidder **prior to or after a Submission opening, if the Bidder:**

- (a) is or has in the past 10 years been a party to litigation with the HDSB; or
- (b) directly or indirectly, including by common ownership or control or otherwise, is related to a party currently in litigation with the HDSB or a party that has in the past 10 years been in litigation with the HDSB; or
- (c) intends to use a subcontractor in respect of a specific project who is, or has in the past 10 years been a party to litigation with the HDSB, or who is related to a party currently in litigation with the HDSB or a party that has in the past 10 years been in litigation with the HDSB.

For the purposes hereof, the phrase "litigation with the HDSB" includes cases in which the Bidder or prospective Bidder or any of the parties named above, has advised the HDSB in writing of their intention to commence litigation, or have commenced or have advised the HDSB of their intention to commence an arbitral proceeding against the HDSB (excepting only construction lien demands, notices or proceedings or arbitrations under O. Reg 444/98 of the Education Act).

In determining whether or not to exercise its discretion as set out herein, the HDSB will consider whether the litigation (past or current) is likely to affect a Bidder's ability to work with the HDSB, its consultants and representatives, and whether the HDSB's experience with the Bidder, the related party or subcontractor, as the case may be, in the matter giving rise to the litigation, indicates that the HDSB is likely to incur increased staff and legal costs in the administration of the Contract if it is awarded to the Bidder.

18. Accessibility for Ontarians with Disabilities (AODA)

The HDSB is committed to accessibility and preventing and removing barriers for persons with disabilities. Where practicable, the HDSB will incorporate accessibility features and criteria when procuring or acquiring goods, services and facilities, in which case, a Bidder must be capable of recommending and delivering same in an inclusive and accessible manner, consistent with the Ontario Human Rights Code ("OHRC"), the Ontarians with Disabilities Act, 2005 ("AODA") and its Regulations, in order to achieve accessibility for Ontarians with disabilities. If the HDSB determines that it is impractical to do so an explanation will be provided upon request.

In accordance with Ontario Regulation 429-07 made under the AODA, the HDSB has established policies, practices and procedures governing the provisions of its services to persons with disabilities, which may be found at:

https://www.hdsb.ca/our-board/Pages/Accessibility.aspx

19. Ability to Negotiate/Contract Negotiations

The HDSB reserves the right to enter into negotiations with any Bidder as it sees fit, or with another Bidder concurrently. The HDSB will not incur liability to any Bidder as a result of these negotiations.

The HDSB may, prior to and after Contract award, negotiate changes to the specifications, the type of materials or any conditions with the successful or preferred Bidder or one or more of the Bidders without having any duty or obligation to advise any other Bidder or to allow them to vary their bid prices as a result of such changes, and the HDSB shall have no liability to any other Bidder as a result of such negotiations or modifications.

20. Agree to Abide by the Established Process

It is vital to the HDSB that the process leading to the recommendation of a bidder(s) and the conclusion of an agreement for the provision of these services be, and be seen to be, open and fair and that each of the respondents is treated equally.

No respondent can be seen to be deriving, intentionally or otherwise, an advantage or information, which is not equally available to all other respondents. Nor is it acceptable that any advantage or information be sought or obtained from any unauthorized staff or representative of the HDSB, or any benefit derived from any special or personal relationships or contacts.

All communications, including requests for information, between respondents to this RFT and the HDSB should be between only the representative(s) of the HDSB who has been authorized and designated for that particular purpose. Bidders must not rely on information from any other source.

21. Assignment

Unless otherwise stated in this document, it is mutually agreed and understood that the successful Bidder will not assign, transfer, convey, sublet or otherwise dispose of the Contract (in whole or in part) or the right, title or interest therein, or the Bidder's power to execute such contract to any other person, firm, company or corporation without the previous written consent of the HDSB. Any act in derogation of the foregoing shall be null and void. For the purposes hereof, the transfer or issuance of shares by a Bidder of more than fifty (50%) percent of the voting securities of a Bidder to any third party other than to an affiliate (as such term is defined in the Business Corporations Act (Ontario)) or the

shareholder or shareholders of the Bidder as of the Closing Date, whether or not such transfer or issuance of voting securities takes place in one or more transactions, shall, for the purposes of this Agreement, be deemed to be an assignment of the Contract requiring the consent of the HDSB, unless such transfer or issuance of shares is made pursuant to an initial public offering of common shares under the Securities Act (Ontario).

22. Award

The final award will be based on (but not limited to) the best value for money and quality service delivery from a Bidder who complies with the provisions of this Submission solicitation, including specifications, contractual terms and conditions, who can reasonably be expected to provide satisfactory performance on the proposed Contract based on reputation, references, performance on previous contracts, and sufficiency of financial and other resources, and provides a solution that is a fit with the HDSB's requirements. The lowest price or bid shall not be the sole, determinative factor.

23. Breaking a Tie

In the event of a tie score, the HDSB will resolve same based on the earlier date/time stamp of when the bid was received by HDSB in accordance with this RFT.

24. Change Orders

A change order results when unforeseen conditions are identified from the original scope of work (Contract or Purchase Order) and is inextricably tied to the original scope.

The following steps should occur prior to issuance of a change order that does not originate from HDSB senior management:

- appropriate HDSB approval must be acquired prior to modifying any Contract or Purchase Order
- appropriate written HDSB approval must be obtained prior to commencing the work.

All requests or recommendations for Change Orders shall include the impact to both price and schedule for the work to be performed. HDSB shall have the right to retain consultants or experts to help identify the need or to verify the impact of the change order on the project.

No change in the work shall proceed without the written approval of the Owner. Any change shall be initiated by Owners "WORK ORDERS" which shall bear the change cost and the Contractor's and Owner's representative's signatures as an instruction to proceed. All changes shall be restricted to five percent (5%) overhead and five percent (5%) profit applied to the labour and material cost.

25. Conflict of Interest

For the purposes hereof, "Conflict of Interest" includes:

- (a) in relation to the Submission process, the Bidder has an unfair advantage or engaged in conduct, directly or indirectly, that may give the Bidder an unfair advantage, including:
 - having or having access to information in the preparation of the Submission that is confidential to the HDSB and not available to other Bidders;
 - (ii) communicating with any person with a view to influencing preferred treatment in the Submission process; or
 - (iii) engaging in conduct that compromises or could be seen to compromise the integrity of the open and competitive process and render that process non-competitive and unfair; or
- (b) in relation to the performance of the Work, services or contractual obligations, the Bidder's other commitments, relationships or financial interests:
 - could or could be perceived to exercise an improper influence over the objective, unbiased and impartial exercise of the Bidder's independent judgments; or
 - (ii) could or could be perceived to compromise or impair or be incompatible with the effective performance of the Bidder's work, services or contractual obligations.

The Bidder shall:

- (a) avoid any Conflict of Interest in the Submission process and in the performance of its contractual obligations;
- (b) disclose to the HDSB without delay any actual or potential Conflict of Interest that arises during the Submission process or during the performance of its contractual obligations; and
- (c) comply with any requirements prescribed by the HDSB to resolve any Conflict of Interest.

In addition to all other contractual rights or rights available at law or in equity, the HDSB may immediately disqualify a Submission or terminate the Contract upon giving notice to the Bidder where:

- i. the Bidder fails to disclose an actual or potential Conflict of Interest;
- ii. the Bidder fails to comply with any requirements prescribed by the HDSB to resolve a Conflict of Interest; or
- iii. the Bidder's Conflict of Interest cannot be resolved.

This paragraph shall survive any termination or expiry of the Contract.

26. HDSB Confidential Information

For the purposes hereof, "HDSB Confidential Information" means all information of the HDSB that is of a confidential nature, including all confidential information in the custody or control of the HDSB, regardless of whether it is identified as confidential or not, and whether recorded or not, and however fixed, stored, expressed or embodied, which comes into the knowledge, possession or control of the Bidder in connection with the Contract. For greater certainty, HDSB Confidential Information shall:

- (a) include:
 - (i) all new information derived at any time from any such information whether created by the HDSB, the Bidder or any third party;
 - (ii) all information (including Personal Information) that the HDSB is obliged or has the discretion not to disclose under provincial or federal legislation or otherwise at law; but
- (b) not include information that:
 - (i) is or becomes generally available to the public without fault or breach on the part of the Bidder of any duty of confidentiality owed by the Bidder to the HDSB or to any third party;
 - (ii) the Bidder can demonstrate to have been rightfully obtained by Bidder without any obligation of confidence, from a third party who had the right to transfer or disclose it to the Bidder free of any obligation of confidence;
 - (iii) the Bidder can demonstrate to have been rightfully known to or in the possession of the Bidder at the time of disclosure, free of any obligation of confidence when disclosed; or
 - (iv) is independently developed by the Bidder;

but the exclusions in this subparagraph shall in no way limit the meaning of Personal Information or the obligations attaching thereto under the Contract or at law.

During and following the term of the Contract, the Bidder shall:

- (a) keep all HDSB Confidential Information confidential and secure;
- (b) limit the disclosure of HDSB Confidential Information to only those of its directors, officer, employees, agents, partners, affiliates, volunteers or subcontractors who have a need to know it for the purpose of carrying out its obligations under the Contract and who have been specifically authorized to have such disclosure;
- (c) not directly or indirectly disclose, destroy, exploit or use any HDSB Confidential Information (except for the purpose of carrying out its obligations under the Contract or except if required by order of a court or tribunal), without first obtaining:
 - (i) the written consent of the HDSB; and
 - (ii) in respect of any HDSB Confidential Information about any third party, the written consent of such third party;
- (d) provide HDSB Confidential Information to the HDSB on demand; and
- (e) return all HDSB Confidential Information to the HDSB before the end of the Term, with no copy or portion kept by the Bidder.

27. Criminal Background Checks

The Bidder acknowledges that the HDSB must be in compliance with Regulation 521/01 of the Education Act (Ontario) - Collection of Personal Information with respect to criminal background checks and offence declarations. The Bidder covenants and agrees to assist the HDSB in complying with same by providing the HDSB, or such other entity as the HDSB may designate, with a criminal background check covering offences under the Criminal Code, the Narcotics Control Act, and any other offences which would be revealed by a search of the automated Criminal Records Retrieval System maintained by the RCMP or, in instances where the Bidder will have access to or is responsible for minors or vulnerable persons, a Vulnerable Persons Clearance certificate in addition to the above ("Criminal Background Check"), together with an Offence Declaration in HDSB approved form, for every individual or employee of the Bidder who may come into direct contact with students on a regular basis at a school site of the HDSB, or who may have access to student information.

For the purposes of this document, the HDSB shall determine in its sole and unfettered discretion whether an individual or employee of the Bidder may come into direct contact with students on a regular basis or may have access to student information. The Bidder agrees to indemnify and save harmless the HDSB from all claims, liabilities, expenses, and penalties to which it may be subjected on account of the Bidder's failure to provide a Criminal Background Check and an Offence Declaration, as aforesaid. This indemnity shall survive the expiration or sooner termination of the Contract. In addition, and

notwithstanding anything else herein contained, if the Bidder fails to provide a Criminal Background Check and an Offence Declaration for an individual or employee of the Bidder who may come into direct contact with students on a regular basis at a school site of the HDSB or who may have access to student information, then the HDSB shall have the right to forthwith terminate the Contract without prejudice to any other rights which it may have in the Contract, in law or in equity.

28. Debrief

The HDSB, at the written request of a Bidder will conduct a debriefing. Bidders must submit their request within sixty (60) days of Contract award notification. The HDSB will only identify any weaknesses or strengths in the Bidder's submission. No information regarding other Bidders' submissions will be disclosed. The intent of the debriefing information session is to assist a Bidder in presenting a better Submission in subsequent procurement opportunities. Any debriefing provided is not for the purpose of providing any opportunity to challenge the procurement process.

29. Dispute Resolution

In the event that a Bidder wishes to review the decision of the HDSB in respect of any material aspect of the RFT process, and subject to having attended a debriefing, the Bidder shall submit a protest in writing to the RFT Authority within ten (10) days from such a debriefing.

Any request that is not received in a timely manner will not be considered, and the Bidder will be notified in writing.

A protest in writing shall include the following:

- (a) a specific identification of the provision and/or procurement procedure that is alleged to have been breached;
- (b) a specific description of each act alleged to have breached the procurement process;
- (c) a precise statement of the relevant facts;
- (d) an identification of the issues to be resolved; and
- (e) the Bidder's requested remedy.

For the purpose of a protest, the HDSB will review and address any protest in a timely and appropriate manner. HDSB's decision in this regard is final.

30. Environmental Statement

The Board, when practically and financially feasible, will consider the acquisition of goods and services that will reduce the environmental footprint of the Board.

31. Force Majeure

Delays in or failure of performance by either party under the Contract shall not constitute default thereunder or give rise to any claim for damages if caused by occurrences beyond the control of the party affected, including but not limited to, decrees of Governments, acts of God, fires, floods, riots, wars, rebellion, sabotage, and atomic or nuclear incidents. Lack of finances, strikes, lockouts or other concerted acts by workers shall not be deemed to be a cause beyond a party's control.

In the event that performance of the Contract in the reasonable opinion of either party is made impossible by an occurrence beyond the control of the party affected, then either party shall notify the other in writing. The HDSB shall either terminate the Contract forthwith and without any further payments being made, or authorize the Bidder to continue the performance of the Contract with such adjustments as may be required by the occurrence in question and agreed upon by both parties. In the event that the parties cannot agree upon the aforementioned adjustment, it is agreed by the parties that the Contract shall be terminated.

32. Guarantees and Warranties

All Work shall be done in a good and workmanship like manner. All materials, goods and services must meet the applicable specifications, either by the HDSB, its consultant on the project or the manufacturer. The Bidder warrants and guarantees that all materials, Goods; Services and workmanship will be free from defects and fit for the purpose intended by the HDSB. All Goods delivered by the Bidder must be new, in good working order and of the latest model possessing all accessories standard to the manufacturer's stock model. The Goods and/or Services must be covered by written guarantees and warranties acceptable to the HDSB.

33. Health & Safety / WHMIS

Bidders and/or contractors must comply with the Occupational Health and Safety Act and its regulations. All Bidder's contractors and sub-contractors and their respective employees will have received health and safety training appropriate to their trade, and will be able to provide proof thereof to the HDSB upon request. Contractors shall be held responsible for any sub-contractors where such are permissible by the HDSB. The HDSB may request and suppliers/contractors/sub-contractors will provide evidence of such training at any time.

Suppliers/contractors/sub-contractors shall comply with the HDSB policies, programs and procedures at all times while on site. All suppliers/contractors/sub-contractors are

required to sign in upon arrival/exit at a HDSB location prior to beginning and at completion of Work.

Suppliers and/or contractors/sub-contractors shall be held responsible for all fines and/or contraventions of legislation which have been incurred by the HDSB.

As per Ontario regulation 278/05 section 10 (5) the HDSB will provide contractors/subcontractors performing work in HDSB buildings access to the site-specific asbestos inventory. Site specific asbestos inventories are available at each HDSB site. Contractors/sub-contractors shall review the site-specific asbestos inventory in relation to the scope of work they are undertaking, prior to the commencement of work. The requirements of the HDSB's Asbestos Management Administrative Procedure are to be adhered to at all times. A copy of the HDSB's Asbestos Management Administrative Procedure can be found at:

http://www.hdsb.ca/our-board/Policy/AsbestosManagementInFacilities.pdf.

All Work is subject to prior approval by the appropriate HDSB department.

Contractors shall examine carefully the HDSB's Asbestos Register for the Work site, in addition to examining existing conditions for suspected Asbestos Containing Materials (ACM), on which completion of Work is dependent.

Upon discovery of unforeseen suspected ACM affecting completion of the Work, the Contractor shall cease any operations that may disturb said materials and notify the Owner immediately.

The Contractor shall arrange for removal of ACM affecting completion of Work through a HDSB-approved ACM abatement contractor, and arrange for coordination of testing through HDSB Facility Services, if required.

Contractors shall be responsible for any sub-contractors in their employ with respect to the aforementioned requirements.

34. Indemnification and Liability

The Bidder hereby agrees to indemnify and hold harmless the HDSB, its directors, officers, trustees, employees and agents from and against all liability, loss, costs, damages and expenses (including legal, expert and consultant fees), causes of actions, actions, claims, demands, lawsuits or other proceedings, by whomever made, sustained, incurred, brought or prosecuted if:

(a) resulting from the Bidder's failure to observe and conform to the standards established by law or by any other association which has established standards recognized by the Province of Ontario;

- (b) relating to labour and equipment furnished for the Work; and
- (c) involving inventions, copyrights, trademarks or patents, and rights thereto, used in doing the Work and in the subsequent use and operation of the Work or any part thereof upon completion.

35. Insurance and Liability

The successful bidder must indemnify the HDSB from any and all manner of damage or injury, risk, claims, demands, actions, penalties, causes of action, damages and any and all costs arising out of, or incurred by reason of provision of goods and/or services by the bidder. The cost of such insurance will be the responsibility of the Bidder.

The successful bidder(s) will obtain and provide current proof of insurance upon the award, that the successful Bidder will be covered by:

at least Two Million Canadian Dollars (C\$2,000,000.00) of comprehensive commercial general liability insurance for bodily injury, property damage, operations liability, contractual liability and tenant's legal liability, including umbrella liability insurance covering liability arising from premises, operations, independent contractors, productscompleted operations, personal injury and liability assumed under the Contract;

at least One Million Canadian Dollars (C\$1,000,000.00) of business automobile liability insurance and, if necessary, umbrella liability insurance for owned, hired and non-owned vehicles covering bodily injury and property damage: and With an insurer licensed to carry on business in the Province of Ontario.

In the case of multi-year contracts, a copy of a valid certificate must be provided to the Halton District School HDSB annually thereafter, at least thirty (30) days prior to the anniversary date of the contract commencement date. At commencement of the Contract and throughout the Contract duration, certification shall be submitted on a Certificate of Insurance form with the above-mentioned coverage, thereby protecting the Halton District School Board against claims for property damage and bodily injuries, including accidental death, caused by the successful Bidder(s) or its employees and/or Sub-contractors during the performance of its obligations under the Contract.

The Halton District School Board must be named as additional insured, and the policy must contain a cross liability clause, and thirty (30) day prior notice clause of any cancellation, non-renewal or product change in coverage, terms or conditions.

As a condition precedent to contract award, Certificates of all such insurance policies shall be filed with the HDSB by the successful Bidder and shall be subject to the HDSB's approval as to the adequacy of protection.

All the above-mentioned insurance shall be maintained until the HDSB certifies that the work is complete.

36. Invoicing/Payment/EFT

To ensure that payment is not deferred, the following information shall be on all invoices:

- Bidder's Name or Business Number, Address, Telephone Number and HST registration number
- Invoice Date
- Invoice Number
- Purchase Order Number, Name of Requester, Shipment Destination
- Name of Halton District School Board staff that issued this order
- Complete Good/Service Description (including hourly rates, service/delivery dates, service location)
- Attach Copy of Service Report/Work Order Completed
- Terms of payment
- Total of HST where applicable
- Total Amount Payable

The HDSB's method of payment is by Electronic Funds Transfer (EFT). If the Bidder is a new vendor or current vendor who has not previously utilized the EFT payment service or has banking information which has changed, then an "Application of Vendor Direct Deposit" form is required to be completed, which is available through the Purchasing contact for this document. This form along with a voided cheque or letter from the Bidder's bank should be sent to:

> Halton District School Board Attention: Accounts Payable Department J.W. Singleton Centre, PO Box 5005 Stn LCD 1, Burlington ON L7R 3Z2 or

electronically to: apeft@hdsb.ca before any invoices are submitted to the HDSB for payment.

Payment terms are Net 28. Early payment discounts may be considered.

37. Irrevocability

The Submission will be open for acceptance by the HDSB and irrevocable by the Bidder for a period of one hundred and twenty (120) calendar days from the Closing Date.

38. Municipal Freedom of Information and Protection of Privacy Act ("MFIPPA")

(a) The Bidder acknowledges and agrees that the HDSB is subject to MFIPPA. The Bidder further expressly acknowledges and agrees that, upon the acceptance of a

successful Submission and conclusion of this process (including execution and delivery of the Contract between the HDSB and the successful Bidder), subject to subsection (b) below, the Submission shall not be considered confidential for the purposes of Section 10 of MFIPPA and, in the event of an access request or at the discretion of HDSB, shall be subject to release in its entirety without redaction.

- (b) Notwithstanding paragraph (a) above, the Bidder and the HDSB acknowledge and agree that the information listed below is considered to be supplied by the Bidder to the HDSB in confidence:
 - 1. For Services: Hourly rates/fees and information from which such rates/fees could be reasonably deduced.
 - 2. For Goods: Unit costs and information from which such unit costs could be reasonably deduced.
- (c) Notwithstanding the foregoing, the Bidder acknowledges and agrees that, because the HDSB is subject to MFIPPA, all or part of any Submission, including information supplied in confidence, may be subject to release in response to an access request submitted pursuant to MFIPPA. In the event that the HDSB receives a request for access to all or part of a Submission supplied in confidence, the HDSB shall deliver the relevant notice to the Bidder, who shall bare all costs, legal or otherwise, with respect to any objection the Bidder may have in respect of the release of any or all parts of the Submission pursuant to MFIPPA.

39. No Guarantee of Work or Exclusivity of Contract

The HDSB makes no guarantee of the value or quality of goods or services or volume of work to be assigned to the successful Bidder. Any Contract executed with a successful Bidder may not be an exclusive Contract for the provision of the requested Goods or Services. Quantity where specified more or less, are estimates of previous consumption and are furnished without liability to the HDSB.

40. Non-Performance/Termination of Contract

If the Bidder delivers substandard, unapproved or defective items, which are rejected by the HDSB, the Bidder agrees to replace these items at the Bidder's expense with items of a quality deemed acceptable to the HDSB within a 48-hour period of the mutual satisfactory agreement being reached. If the Bidder fails to replace the items within this 48-hour period, the parties agree that the HDSB may purchase substitutes for the rejected items in the open market at no additional cost or liability to the HDSB.

Where at any time the quality of the Goods or Service supplied by the successful Bidder is not of a satisfactory standard, the HDSB may issue a verbal warning outlining the deficiency in supply or other aspects of performance and requiring the successful Bidder to correct those deficiencies within such period of time as stated. If the deficiency is not corrected within the time specified, or having been corrected, there is a further instance of deficient performance, the HDSB may issue a written notice to the successful Bidder, identifying the deficiency in performance and setting a final date or time period for its correction, and advising that if corrective steps are not taken by that date or within that time, the HDSB may terminate the Contract and take corrective action itself.

Until the HDSB is satisfied that the unsatisfactory performance has been corrected, the HDSB may hold back from any payment an amount sufficient to rectify the unsatisfactory performance until its requirements have been met.

The HDSB reserves the right, in its absolute discretion, to terminate a Contract immediately without penalty, costs or damages of any kind whatsoever, where the Bidder has violated any laws or performed any of the following acts while performing work with the HDSB and further reserves the right to take that failure into account with respect to the award of any future contract.

- a) over-billing or duplicate billing;
- b) splitting of invoices;
- c) charging for items not supplied;
- d) charging for items not approved prior to invoicing;
- e) charging for items of one grade, while supplying items of an inferior grade;
- f) Misrepresentation as to the quality or origin of goods, their functionality or suitability for a purpose, or their performance characteristics;
- g) not responding to the HDSB or, failure to complete contract.

41. Ownership

The Submission, along with all correspondence, documentation and information provided to the HDSB by any Bidder in connection with or arising out of the Submission, once received by the HDSB, shall become the property of the HDSB and may be appended to any Contract and/or purchase order with the successful Bidder.

42. Permits, Licenses and Approvals

Bidders shall obtain all permits, licences and approvals required in connection with the supply of the Goods and/or Services. The costs of obtaining such permits, licences and approvals shall be the responsibility of, and shall be paid for by the Bidder.

Where a Bidder is required by any Applicable Law to hold or obtain any such licence, permit, or approval to carry on an activity contemplated in its Submission or in the

Contract, neither the acceptance of the Submission nor the execution of the Contract by the HDSB shall be considered an approval by the HDSB for the Bidder to carry on such activity without the requite licence, permit, consent or authorization.

Without in any way limiting the generality of the foregoing, any electrical Goods being proposed for consideration pursuant to this RFT must be authorized or approved in accordance with the Electrical Safety Code or by a certification organization accredited with the Standards Council of Canada Act (Canada), and shall bear the certification organization's mark identifying the Goods certified for use in Canada. Certification shall be to the standard that is appropriate for the intended use of the electrical Goods at any of the HDSB's schools or facilities.

43. Co-operative Purchasing Provisions

This document is being issued by the HDSB to meet the HDSB's requirements. The successful Bidder acknowledges that the Provincial Government encourages cooperative procurement initiatives by School HDSBs. Bidders shall indicate on the Form of Quotation if they are willing to extend pricing and submission terms to other District School Boards in the province of Ontario where the scope of work is deemed similar or the same and where both parties are in agreement, in which case they shall be deemed to have granted consent to the HDSB to share the Submission with such HDSBs, subject to such HDSBs agreeing to receive the Submission in confidence on the understanding that the Submission contains financial, commercial, technical and other sensitive information of the Bidder. The Bidder will not be penalized if it does not agree to this provision. The HDSB will not incur any financial responsibility in connection with any purchase by another School Board. Each School Board shall accept sole responsibility for its own contract management such as placing orders and making payments to the successful Bidder.

44. Proof of WSIB Coverage

If the Bidder is subject to the Workplace Safety and Insurance Act ("WSIA") or the Workplace Safety and Insurance Amendment Act, 2008 ("WSIAA"), the Bidder shall submit a valid clearance certificate of Workplace Safety and Insurance Board ("WSIB") coverage to the HDSB before commencing the performance of any work or services. In addition, the Bidder shall, from time to time during the term of the Contract and at the request of the HDSB, provide additional WSIB clearance certificates. The Bidder covenants and agrees to pay when due, and to ensure that each of its subcontractors pays when due, all amounts required to be paid by it or its subcontractors, from time to time during the term of the Contract, under the WSIA and/or the WSIAA, failing which the HDSB shall have the right, in addition to and not in substitution for any other right it may have pursuant to the Contract or otherwise at law or in equity, to pay to the WSIB any amount due pursuant to the Contract together with all costs incurred by the HDSB in connection therewith.

45. Right to Withdraw

Submissions may be withdrawn prior to the Closing Time. Following Closing, no Submission may be withdrawn. Any Bidder who attempts to do so may have a negative Performance Evaluation placed on record with the HDSB in accordance with the Vendor Performance Management Administrative Procedure

(www.hdsb.ca/our-board/Policy/VendorPerformanceManagement.pdf)

46. Smoking on HDSB Property

Smoking of any substance and in any manner is prohibited in all HDSB buildings and on all HDSB property. This includes, without limitation, tobacco, cannabis in any form and vaping.

47. Vehicle Operation on HDSB Property

The successful Bidder shall use due care and caution when motorized vehicles are in operation on school property while students are expected to enter or exit the school building and/or are visible outside the school building on school property or adjacent property, particularly during recess, lunch period and preceding and following the end of the school day. Vehicles operated in parking lot and driveway areas shall not be driven at a speed in excess of 8-kilometers/per hour.

Further, on school property drivers must turn off vehicles and remove the keys during any stop. At no time are vehicles to be left running while unattended. It is recommended that the vehicle be locked when left unsupervised. The HDSB will not be responsible for any theft of, or any theft from, vehicles operated by the successful Bidder.

Asphalt play areas around the exterior of the school building are not constructed to handle heavy vehicles. Bidders will be held responsible for any damage to HDSB property including but not limited to asphalt or natural surfaces as a result of using them for access of heavy vehicles. Making good of natural surfaces or asphalt areas that are damaged in the course of the work shall be to the original (new) condition irrespective of their condition prior to commencement of the work, or the condition of the adjacent unaffected areas. Vehicles are only permitted to access, stand or be parked in areas designated by administrative staff of HDSB, which for the purposes of this provision does not include principals of schools.

48. Bidder Conduct

When on HDSB property, the Bidder and its employees must:

• have proper identification (name badge, uniform with logo, photo I.D. etc).

- be dressed appropriately (the following are not appropriate: clothing that fails to contain the anatomy when the person is carrying out normal duties; clothing with printed slogans, advertising or designs that are obscene or could have a double meaning).
- use appropriate language.
- refrain from wearing scented products or fragrances such as perfume, cologne, after shave, shampoos (as required).
- work with dignity, courtesy and respect for self and others.
- not make noise or move in corridors during morning announcements, and playing of the national anthem.
- observe procedures during fire evacuation and lockdowns, whether they are actual or test (drills).
- park in spots designated by the Principal.

The Bidder must observe all HDSB policies and procedures including but not limited to: Smoke-Free Environment; Sexual, Racial and Ethno Cultural Harassment, etc.

The Bidder will ensure that the education program is not interrupted and that the health and safety of the students and staff is not compromised.

No person who is impaired by alcohol or drugs will enter and/or remain on HDSB property.

The Bidder agrees that its employees and sub-contractors will observe and comply with all standards, procedures, policies, rules and regulations of the HDSB, including but not limited to privacy, use of facilities, equipment, building security and computer technology.



FORM OF TENDER

Project: School Renovations – John T. Tuck Public School **Project Reference #:** RFT 21-116

From (Bidder):_____

Company Name

Street Address

City, Province and postal code

Phone Number

Email Address

To (Owner): Halton District School Board 2050 Guelph Line Burlington, Ontario L7P 5A8

We, the undersigned, having examined the Tender Documents for the above-named Project, including Addenda, hereby offer to perform the Work in accordance with the Tender Documents, for the Stipulated Price of:

Base Bid Amount	\$
Cash Allowance (Inspection & Testing; PA System Changes)	\$10,000
Contingency	\$10,000
Total Amount (Excluding HST):	\$

Form of Tender Continued RFT 21-116 School Renovations – John T. Tuck Public School Page 2 of 2

Proposed Sub-Contractors:

Electrical	 	
Mechanical	 	
Roofing		

We, the undersigned, declare that:

- a. We agree to perform the Work within the required completion time specified in the Tender Documents,
- b. We have arrived at the Tender without collusion with any competitor,
- c. This Tender is open to acceptance by the Owner for a period of 90 days from the date of Tender Closing,
- **d.** All Form of Tender supplements called for by the Tender Documents from an integral part of this Tender.

Signature:

LEGAL NAME OF BIDDER

DATE

AUTHORIZED SIGNATURE OF BIDDER I have the authority to bind the Bidder & TITLE

PRINTED NAME

SEAL



APPENDIX A - DECLARATION SIGNATURE SHEET

- 1. I/WE DECLARE that this Submission is made without collusion, knowledge, and comparison of figures or arrangement with any other company, firm or person submitting a Submission for the same work.
- 2. I/WE DECLARE that to our knowledge no member of Halton District School Board is, will be or has become financially interested, directly or indirectly, in any aspect of the Contract other than in the appropriate discharge of his/her obligations as an employee/officer of Halton District School Board.
- 3. I/WE HAVE READ, Understood and agree to abide by the Agreement to Abide by the Established Process.
- 4. I/WE HAVE CAREFULLY examined the RFT documents, and have a clear and comprehensive knowledge of what is being requested hereunder. By submitting the Submission, the Bidder agrees and consents to the administrative procedures of the Board, as well as the procedures, terms, conditions and provisions of the RFT, including the Form of Tender.
- 5. I/WE have carefully examined all of the Proposal Documents, and that we have thoroughly reviewed all proposal documentation and addenda number _____to____, and hereby accept and agree to same as forming part and parcel of the proposed Contract.
- 6. I/WE ARE AUTHORIZED BY and have the authority to bind the Bidder.

DATE:	
NAME: Please Print	
SIGNATURE:	
TITLE:	
COMPANY NAME:	
ADDRESS:	
PHONE NUMBER:	
E-MAIL ADDRESS:	
E-MAIL to Send PO:	

APPENDIX B – PRE-QUALIFIED SUB-CONTRACTORS

ELECTRICAL

Arcadian Projects Inc.	Jeff Vidmar	jeff@arcadianprojects.ca	519-804-9697
B-Safe Electric Ltd	Brian Scheele	firas@b-safe.ca	905-872-7233
Best Electric	Gurmukh Sehmbi	gsehmbi@bestelectric.ca	905-415-2378
Bradco Electrical Services Ltd	Brad Groulx	brad@bradcoelectric.com	905-890-0506
CEC Services Limited (Aurora)	Kyle Feinstein	estimating@beswickgroup.com	905-713-3711
Gremar Electric Ltd	Gennaro Di Gregorio	gennaro@gremar.ca	416-674-1442
Kraun Electric Inc.	Kevin Krause	estimating@kraun.ca	905-684-6895
McCleary Electric Ltd.	Ron VanderMeulen	mcclearyelectric@bellnet.ca	905-634-7634
North Star Electric	Greg Harris	estimating@northstarelectric.ca	905-845-9063
PRL-GUITE Electric Ltd.	Paul Leaker	estimating@prlguite.ca	905-549-6711
Star Electrical Services Inc.	Harvinder Kahlon	info@starelectrical.ca	905-799-3883

MECHANICAL

Airon HVAC and Control Ltd.	Ryan Haan	info@airongroup.ca	905-331-6555
Arcadian Projects Inc.	Jeff Vidmar	jeff@arcadianprojects.ca	519-804-9697
B & B Mechanical Service	Harmanpreet Swaich	harman@bbmechanicalservices.ca	905-696-9991
L.J. Barton Mechanical Inc.	Jim Barton	estimating@ljbarton.com	905-304-1976
Besseling Mechanical Inc	Cameron Besseling	cameron@besselingmechanical.com	905-560-0200
Black & McDonald Limited	Simon Watson	swatson@blackandmcdonald.com	289-919-1209
CEC Mechanical Ltd.	Mike Manner	mmanner@beswickgroup.com	905-713-3711
Forrest Mechanical Inc.	David M. Mollison	david@forrestmechanical.com	905-338-8109
Kirk Mechanical Limited	Robert Kirk	kirkmech@bellnet.ca	905-681-0140
Lancaster Group Inc.	Jason Gray	jgray@lancastergroup.ca	905-388-3800
Mattina Mechanical Limited	Domenic Mattina	info@mattina.ca	905-544-6380
Naylor Building Partnerships	Daniel Guidoni	DGuidoni@naylorbp.com	905-338-8000
Nutemp Mechanical Systems Ltd.	David McMichael	info@nutemp.ca	905-338-5603
Roszell Plumbing & Heating Ltd.	Ryan Roszell	info@roszellplumbing.ca	905-844-0418
Union Boiler Company of Hamilton	David Aldighieri	unionboilerco@bellnet.ca	905-528-7977

ROOFING

Atlas-Apex Roofing Inc	John McDowell	inquiries@atlas-apex.com	416-421-6244
Atlantic Roofers Ontario Ltd	Tony Pocobene	tpocobene@on.aibn.com	905-573-6202
B&G Roofing & Sheet Metal Inc	Guy Cruickshanks	info@bg-roofing.ca	905-545-4493
The Consilium Group	Gary Ostermeier	consiliumgroup@on.aibn.com	905-825-3599
Cordeiro Roofing Ltd	Silvia Kostihova	info@cordeiroroofing.com	416-234-9901
Crawford Roofing Corporation	Nelson Rites	nelson.rites@crawfordroofing.ca	416-787-0649
Dean-Chandler Roofing Limited	Ken Goodale	kengoodale@deanchandler.ca	416-751-7840
Eileen Roofing Inc	Dianne Cabral	eileen@eileenroofing.com	416-762-1819
Flynn Canada Ltd	Joseph Raposo	Joseph.Raposo@flynncompanies.com	905-643-9515
GRRC Roofing	George Roque	george@grrc.ca	905-393-7989
Pollard Enterprises Ltd	Jamie Pedra	jamiepedra@pollardroofing.com	305-332-6660
Proteck Roofing & Sheet Metal Inc	Mary Ma	info@proteckroofing.com	416-630-2300
Roof & Building Service Intl	Darren Beere	Darren.b@rbs-na.com	613-264-1012
Roque Roofing Inc	Scott Wager	scott@roqueroofing.com	905-525-9689
Schrieber Brothers Limited Roofing & Sheet			
Metal	Marinos Barlas	marinos@schrieberroofing.com	905-561-7780
Semple Gooder Roofing Corporation	Derek Wansbrough	dwansbrough@semplegooder.com	416-743-5370
Sproule Specialty Roofing Ltd	Gordon Sproule	info@sprouleroof.ca	416-503-1887
Top-Line Roofing & Sheet Metal Inc	Leandro Pedra	info@top-lineroofing.com	905-602-0760
Triumph Roofing & Sheet Metal Inc	Mario Ribeiro	info@triumphinc.ca	416-534-8877
Viana Roofing & Sheet Metal Limited	Joe Flores	info@vianaroofing.com	416-732-2664

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DRAWINGS NO.	DESCRIPTION	
A1.00	ARCHITECTURAL DRAWINGS Reflected Ceiling Plan & OBC Matrix	
E1 E2	ELECTRICAL DRAWINGS Electrical Legend, Notes and Key Plan Existing & New Electrical Plans	
R1 R2 R3 R4 R5 R6 R7 S1-1	ROOFING DRAWINGS Key Plan Roof Plan Tapered Insulation Plan Details D1 - D4 Details D5 - D8 Details D9 - D12 Area S1 Plan and Elevation Structural - Partial Skylight Infill Framing Plans / Plan Notes and Sections	3

WINDOW DRAWINGS

- A-1 Floor Plans
- A-2 Window Elevations
- A-3 Window Fenestrations
- A-4 Windows Details
- A-5 Window Details

End of Section
1. Definitions

- The following Section of this Specification are of the abbreviated type and include incomplete sentences. Definite and indefinite articles have often been omitted and sentences are written in the form of direct instructions to the Contractor without using the phrase `the Contractor shall.' Standard specifications and other quality references inserted govern materials and workmanship without using phrases `conform with,' `conformity therewith,' etc. Omitted words and phrases to be supplied in the same manner as they are when a note appears on the Drawings.
- 2. The Specifications are separated into Sections for reference convenience only. Such separation must in no instance make Owner or his Consultants arbiter to establish subcontract limits between Contractor and Subcontractor.
- 3. Provide all items, articles, materials, operations or methods listed, mentioned or scheduled on Drawings and/or in Specifications, including all labour, materials, equipment, tools, services, and incidentals necessary and required to complete the work. Responsibility for breakdown into and extension of subcontracts, including co-ordination of same, rests entirely with the Contractor.
- 4. Standard Specifications referred to are editions in force at Tender Closing Date.

2. Terminology

- 1. Consultants are the team of Architects, Engineers and other experts commissioned by the Owner, directly or indirectly, to execute design, contract documents and supervision for the project, including any of their agents or employees.
- 2. Prime Consultant is the Architect.
- 3. Contractor is the Firm or Corporation who, having signed the Agreement, has the sole legal responsibility to carry out the work shown or described in the Contract Documents for the Owner, whether contractually assigned to a Subcontractor or supplier, or not.

3. Minimum Standards

- Unless otherwise specified, work and material to conform or exceed the minimum standards set out in the editions of the Canadian Government Specification Board, Canadian Standards Associations, the Ontario Building Code, Underwriters' Laboratories of Canada, the Canadian Electrical Code, the Local Building Code in force, whichever is applicable.
- 2. Copies of Standard Specifications referred to in this Specification to be kept on the site.
- 3. The use of the name (or its abbreviation) of any of the following bodies, accompanied by the reference number of a specification of that body to mean that the entire specification of the body to apply as noted:

- AISC: American Institute of Steel Construction;
- ASTM: American Society for Testing Materials;
- CEC: Canadian Electric Code;
- CGSB: Canadian Government Specification Board;
- CISC: Canadian Institute of Steel Construction;
- CRCA: Canadian Roofing Contractors' Association;
- CSA: Canadian Standards Association;
- OBC: Ontario Building Code;
- ULC: Underwriters' Laboratories of Canada;
- CLA: Canadian Lumbermen's Association.

4. Cooperation

- 1. Each trade to cooperate with the trades of adjacent or affected work. Supply in good time requirements effecting adjacent and underlying work in writing and items to be set or built in. Similarly, heed requirements and build-in items provided by other trades.
- 2. Take necessary precautions to protect work of other trades from contamination, marring or other damage due to application or installation processes, methods and activities.
- 3. General Contractor and each trade to cooperate with Contractors which may be assigned or selected by the Owner to perform work under Cash Allowances. Owner reserves the right to assign nonunionized labour to perform work under Cash Allowances, at Owners discretion.

5. Coordination

- 1. Coordinate the work of all trades in such a manner that each trade co-operates with the trade of adjacent work.
- 2. Organize weekly job site meetings and send out notices stating time and place to Consultants, subcontractors, Suppliers and all others whose presence is required at the meetings.
- 3. Take note of all persons attending these meetings and submit to Consultants and Owner, Minutes of these Meetings showing any major decisions made and instructions or information required.
- 4. Coordinate the Work in this Contract with the work of others awarded work under Cash Allowances.

6. Building Dimensions and Co-ordination

- 1. Ensure that all necessary job dimensions are taken and all trades are coordinated for the proper execution of the work. Assume complete responsibility for the accuracy and completeness of such dimensions, and for coordination.
- 2. Verify that all work, as it proceeds, is executed in accordance with dimensions and positions indicated which maintain levels and clearances to adjacent work, as set out by

requirements of the drawings, and ensure that work installed in error is rectified before construction resumes.

- Check and verify all dimensions referring to the work and the interfacing of all services. Verify all dimensions, with the trade concerned when pertaining to the work of other trades. Be responsible to see that Subcontractors for various trades co-operate for the proper performance of the Work.
- 4. Avoid scaling directly from the drawings. If there is ambiguity or lack of information, immediately inform the Consultant. Be responsible for any change through the disregarding of this clause.
- 5. All details and measurements of any work which is to fit or to conform with work installed shall be taken at the building.
- 6. Advise Consultant of discrepancies and if there are omissions on drawings, particularly reflected ceiling plans and jointing patterns for paving, ceramic tile, or carpet tile layouts, which affect aesthetics, or which interfere with services, equipment or surfaces. DO NOT PROCEED without direction from the Consultant.
- 7. Ensure that each Subcontractor communicates requirements for site conditions and surfaces necessary for the execution of the Subcontractor's work, and that he provides setting drawings, templates and all other information necessary for the location and installation of material, holes, sleeves, insets, anchors, accessories, fastenings, connections and access panels. Inform other Subcontractors whose work is affected by these requirements and preparatory work.
- 8. Prepare interference drawings to properly co-ordinate the work where necessitated. Refer to Section 01340.

7. Use of Premises Before Substantial Performance

 The Owner shall have the right to enter and occupy the building, in whole or in part, for the purpose of placing fittings and equipment, or for other use, before completion of the Contract if, in the opinion of the Consultant, such entry and occupancy does not prevent or interfere with the Contractor in the performance of the Contract. Such entry shall in no way be considered as an acceptance of the Work in whole, or in part, nor shall it imply acknowledgment that terms of the Agreement are fulfilled.

8. Layout of Work

- 1. Layout work with respect to the work of all trades. Arrange mechanical and electrical work such as piping, ducts, conduits, panels, equipment and the like to suit the architectural and structural details.
- 2. Alterations necessary due to conflict and interference between trades, to be executed at no cost to the Owner unless notification is given in writing before Tender Closing Date.

9. By-Laws and Regulations

- 1. Nothing contained in the Drawings and Specifications are to be so construed as to be knowingly in conflict with any law, by-law or regulation of municipal, provincial or other authorities having jurisdiction.
- 2. Perform work in conformity with such laws, by-laws and regulations and make any necessary changes or deviations from the Drawings and Specifications subsequently required as directed and at no cost to the Owner unless notification is given in writing before Tender Closing Date.
- 3. Furnish inspection certificates and/or permits as may be applicable as evidence, that installed work conforms with laws, by-laws, and regulations of authorities having jurisdiction.

10. Protection

- 1. Take necessary precautions and provide and install required coverings to protect material, work and finishes from contamination, damage, the elements, water and frost.
- 2. Make good any damage or replace damaged materials, as directed. Repairs to be made by the trade having originally installed or fabricated the damaged material, finish or item. Protect electrical equipment from water and the elements.
- 3. Protect adjacent private and public property from damage and contamination.
- 4. Protect curbs and sidewalks from damage from trucking by means of boards and the like. Repair, or pay or repair of damage to existing roads and sidewalks.
- 5. Mark glass after glazing in an acceptable manner, and leave in place until final clean-up.
- 6. Protect floor finishes from construction traffic and transport of construction materials and equipment by means of 6 mm plywood panels.

11. Delivery, Handling and Storage of Materials

- 1. Schedule material delivery so as to keep storage at site to the absolute minimum, but without causing delays due to late delivery.
- 2. Store materials which will be damaged by weather in suitable dry accommodation. Provide heat, as required, to maintain temperatures recommended by material manufacturer.
- 3. Store highly combustible or volatile materials separately from other materials, and under no circumstances, within the building. Protect against open flame and other fire hazards. Limit volume of supply on the site to minimum required for one day's operations.
- 4. Handle and store material so as to prevent damage to material, structure and finishes. Avoid undue loading stresses in materials or overloading of floors.

- 5. Do not store material and equipment detrimental to finished surfaces within areas of the building where finishing has commenced or has been completed. All material storage within the building is subject to relocation, as directed.
- 6. Deliver package material in original, and Storage of unopened and undamaged containers with manufacturer's labels and seals intact.

12. Debris

- 1. Assign clean-up duties to a crew with own Foremen which will be of sufficient size to prevent accumulation of debris and dirt in any part of the structure or on the site.
- 2. Remove construction debris on a daily basis and legally dispose of same.
- 3. Under no circumstances, should debris, rubbish or trash be burned or buried on the site.

13. Cutting, Fitting and Patching

- 1. Required cutting to be done by General Contractor. Patching and painting of work to be executed by the General Contractor.
- 2. All sub-trades are to notify the General Contractors bidding as to the extent of the cutting, patching, and painting of their respective trades.
- 3. Drilling, cutting, fitting and patching necessary due to failure to deliver items to be built-in time, or installation in wrong location to be executed, as directed, at no cost to the Owner.
- 4. Give written notification prior to commencement of drilling and cutting of load bearing structural members and finished surfaces.
- 5. Cut holes with smooth, true, clean edges, after they are approved by applicable trade. Size holes and openings for hot water and steam pipes, so as to allow for expansion and contraction of such pipes.

14. Fastenings

- 1. Supply all fastenings, anchors and accessories required for fabrication and erection or work.
- 2. Metal fastenings to be of the same material as the metal component they are anchoring, or of a metal which will not set up an electrolysis action which would cause damage to the fastening or metal component under moist conditions.
- 3. Exposed metal fastenings and accessories to be of the same texture, color, and finish as base metal on which they occur. Keep to a minimum; evenly space and lay out.
- 4. Fastenings to be permanent, of such a type and size and installed in such a manner to provide positive anchorage of the unit to be secured. Wood plugs are not acceptable. Install anchors at required spacing to provide required load bearing or shear capacity.

5. Power actuated fastenings not to be used without prior written approval for specific use.

15. Surplus Materials

- 1. Surplus materials specifically so specified, to remain property of the Owner and be neatly stockpiled or stored, as directed.
- 2. All other surplus materials to become property of the Contractor; to be removed from the site and legally disposed of.

16. Documents Required and General Duties

1. At Commencement of Contract

- .1 Supply Public Liability and Property Damage Insurance Certificates.
- .2 Supply Certificates of good standing from Workers' Compensation Board for the General Contractor and all Subcontractors.
- .3 Supply Contract Sum Breakdown of all sub-trades or parts of work and general expense items.
- .4 Supply Construction Schedule.
- .5 Supply Schedule of Shop Drawing Submissions.
- .6 <u>The Owner has paid for the cost of the Building Permit. Mechanical Subcontractor</u> <u>will pay the cost of other Fees related to the Work Specified under Division 15.</u> <u>Electrical Subcontractor will pay the cost of all permits and fees related to the Work</u> <u>Specified under Division 16.</u>
- .7 The General Contractor is to pay all other fees and refundable deposits if applicable.

2. During Construction

- .1 Adjust Allowances, as required.
- .2 Organize Job Meetings.
- .3 Supply Monthly Progress Reports and Construction Schedule.
- .4 Confirm that payments are being made to subcontractors and suppliers by submission of receipts with the second and subsequent Progress Payment Application. No payment will be made for unincorporated material on the site, unless Bill of Sale in proper format is provided.

3. Upon Completion

- .1 Upon completion of work before the Final Certificate of Payment is issued, the following to be observed, executed and submitted:
 - .1 All deficiencies to have been completed in a satisfactory manner.
 - .2 All final clean-up to have been executed.
 - .3 Finishing Hardware, Inspection and Verification.
 - .4 Organize a Final Inspection tour at which to be present:
 - the Owner's authorized representative;
 - the Architectural, Structural, Mechanical and Electrical Consultants, and their supervisory personnel, if any;
 - the Contractor and his superintendent.

- .5 Where the above procedure is impossible or where any deficiencies remain outstanding, the Owner's representative and the Consultant concerned, to inspect and accept the affected work and/or material upon notification by the Contractor, that all deficiencies involving this Consultant have been made good.
- .6 A complete release of all liens arising out of this Contract, other than his own. If a subcontractor or supplier refuses to furnish a release of such a lien, furnish a bond satisfactory to the Owner to indemnify him against any claim under such a lien.
- .7 Certificates of good standing from the Workers' Compensation board, for the General Contractor and all Subcontractors.
- .8 Certificate of Inspection from Mechanical and Electrical Engineers.
- .9 Copies of all Lists of Deficiencies with each Deficiency verified when complete by only this project's job Superintendent. The Final List of Deficiencies to be signed, completed by all concerned, if accepted.
- .10 Statement of Completion from General Contractor.
- .11 Final adjustment of all Allowances.
- .12 H.E.P.C. Inspection Certificate and all other Inspection Certificates required by Provincial, Municipal and other authorities having jurisdiction.
- .13 Balancing Reports.
- .14 As-Built Drawings Hardcopy mark ups and digital pdf.
- .15 Two hard copies of Operation and Maintenance Manuals. A digital copy (pdf file) of all closeout documents to be provided on a CD or USB memory stick format.

17. Progress Reports

- 1. Submit to the Architect, Monthly Progress Reports consisting of a concise narrative and a marked-up summary schedule showing physical percentage complete by item and in total. These progress calculations must agree with the Progress Payment Claims.
- 2. Keep permanent written daily records on the site on the progress of work. Record to be open to inspection at reasonable times and copies to be furnished upon request. Records to show notes of commencement and completion of different trades and parts of work; daily high and low temperatures and other weather particulars; number of men engaged on the site (including sub-trades) broken down in groups for each type of construction work, and particulars about excavation and shoring; erection and removal of form work; pouring and curing of concrete; floor finishing; placing and compaction of backfill, masonry work; roofing;
- 3. Daily progress to give particulars on commencement and completion of each trade or part of work; form work erections and removal; concrete pouring and curing; floor finishing; masonry work; roofing; waterproofing; finishing trades, tests and inspection and the like.

End of Section

1. General

- 1. Submit to Architect, for review, shop drawings, product data and samples specified.
- 2. Until submission is reviewed, work involving relevant product must not proceed.

2. Shop Drawings

- 1. Drawings to be originals prepared by Contractor, Subcontractor, Supplier or Distributor, which illustrate appropriate portion of work; showing fabrication, layout, setting or erection details as specified in appropriate Sections.
- 2. Identify details by reference to sheet and detail numbers shown on Contract Drawings.
- 3. Maximum sheet size 24" x 36" as PDF.

3. Project Data

- 1. Certain specification Sections specify that manufacturer's standard schematic drawings, catalogue sheets, diagrams schedules, performance charts, illustrations and other standard descriptive data will be accepted in lieu of shop drawings.
- 2. Above will only be accepted if they conform to following:
 - .1 Delete information which is not applicable to project.
 - .2 Supplement standard information to provide additional information applicable to project.
 - .3 Show dimensions and clearances required.
 - .4 Show performance characteristics and capacities.
 - .5 Show wiring diagrams (when requested) and controls.

4. Coordination of Submissions

- 1. Review shop drawings, product data and samples prior to submission.
- 2. Verify:
 - .1 Field measurements.
 - .2 Field construction criteria.
 - .3 Catalogue numbers and similar data.
- 3. Coordinate each submission with requirement of work and Contract documents. Individual shop drawings will not be reviewed until all related drawings are available.
- 4. Contractor's responsibility for errors and omissions in submission is not relieved by Architect's review of submittals.
- 5. Contractor's responsibility for deviations in submission from requirements of Contract documents is not relieved by Architect's review of submission, unless Architect gives written acceptance of specified deviations.

- 6. Notify Architect, in writing at time of submission, of deviations from requirements of Contract documents.
- 7. After Architect's review, distribute copies.

5. Submission Requirements

- 1. Schedule submissions at least fourteen (14) days before dates that reviewed submissions will be required to be returned.
- 2. Submit a digital copy (PDF) of shop drawings, product data to Architect for review.
- 3. Accompany submissions with transmittal letter, containing:
 - .1 Date.
 - .2 Project title and number.
 - .3 Contractor's name and address.
 - .4 Number of each shop drawing, product data and sample submitted.
 - .5 Other pertinent data.
- 4. Submissions must include:
 - .1 Date and revision dates.
 - .2 Project title and number.
 - .3 Name of:
 - .1 Contractor.
 - .2 Subcontractor.
 - .3 Supplier.
 - .4 Manufacturer.
 - .5 Separate detailer when pertinent.
- 5. Identification of product or material.
 - .1 Relation to adjacent structure or materials.
 - .2 Field dimensions, clearly identified as such.
 - .3 Specification Section number.
 - .4 Applicable standards, such as CSA or CGSB numbers.
 - .5 Contractor's stamp, initialled or signed, certifying review of submission, verification of field measurements and compliance with Contract documents.
- 6. Interference Drawings
 - .1 Prepare interference drawings for all work in confined space ie: ceiling space.

End of Section

1. Requirements Included

- 1. Record documents, samples, and specifications.
- 2. Equipment and systems.
- 3. Product data, materials and finishes, and related information.

2. Quality Assurance

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

3. Format

- 1. Organize data in the form of an instructional manual.
- 2. Binders: commercial quality, 8¹/₂" x 11" maximum 2¹/₂" ring size.
- 3. When multiple binders are used, correlate data into related consistent groupings.
- 4. Cover: Identify each binder with type or printed title "Project Record Documents", list title of Project, identify subject matter of contents.
- 5. Arrange content under Section numbers and sequence of Table of Contents.
- 6. Provide tabbed fly leaf for each separate product and system, with typed description of product and major component parts of equipment.
- 7. Drawings: provide with reinforced punched binder tab. Bind in with text; fold larger drawings to size of text pages.

4. Contents, Each Volume

- 1. Table of Contents: Provide title of project; names, addresses, and telephone numbers of Consultant and Contractor with name of responsible parties; schedule of products and systems, indexed to content of the volume.
- 2. For each Product or System: list names, addresses and telephone numbers of subcontractors and suppliers, including local source of supplies and replacement parts.
- 3. Product Data: mark sheet to clearly identify specific products and component parts, and data applicable to installation; delete inapplicable information.
- 4. Drawings: supplement product data to illustrate relations of component parts of equipment and systems, to show control and flow diagrams.
- 5. Typed Text: as required to supplement product data. Provide logical sequence of instructions for each procedure, incorporating manufacturer's instructions.

5. Submission

- Submit one copy of completed volumes in final form 15 days prior to substantial performance. For equipment put into use with Owner's permission during construction, submit Operating and Maintenance Manuals within 10 days after start-up. For items of Work delayed materially beyond date of Substantial Performance, provide updated submittal within ten days after acceptance, listing date of acceptance as start of warranty period.
- 2. Copy will be returned after inspection, with Consultant comments.
- 3. Revise content of documents as required prior to final submittal.
- 4. Submit two copies of revised volumes of data in final form within ten days after final inspection.
- 5. For contract drawings (architectural, landscaping, structural, mechanical, electrical), transfer neatly as-built notations onto second set and submit both sets.
- 6. Prepare digital pdf file for submission on CD of USB of completed closeout documents.

6. Record Documents and Samples

- 1. In addition to requirements in General Conditions, maintain at the site for Owner one record copy of:
 - .1 Contract Drawings.
 - .2 Specifications.
 - .3 Addenda
 - .4 Change Orders and other modifications to the Contract.
 - .5 Reviewed shop drawings, product data and samples.
 - .6 Field test records.
 - .7 Inspection certificates.
 - .8 Manufacturer's certificates.
- 2. Store Record Documents and Samples in Field Office apart from documents used for construction. Provide files, racks, and secure storage.
- 3. Label and file in accordance with Section number listings in List of Contents of this Project Manual. Label each document "Project Record" in neat, large, printed letters.
- 4. Maintain Record Documents in a clean, dry, and legible condition. Do not use Record Documents for construction purposes.
- 5. Keep Record Documents and samples available for inspection by Consultant.

7. Recording As-Built Conditions

1. Consultant will provide two (2) complete sets of white prints of project drawings and two (2) complete sets of specifications for the purpose of recording as-built conditions. Mark and

record one set on an on-going basis as construction proceeds. Near the end of the construction period transfer all marks neatly to second set for submission as project record documents.

- 2. Refer to drawings/specifications for additional mechanical and electrical requirements.
- 3. Record information concurrently with construction progress. Do not conceal work until required information is recorded.
- 4. Contract Drawings and shop drawings: legibly mark each item to record actual construction, including:
 - .1 Measure depths of elements of foundation in relation to finish first floor datum.
 - .2 Measured horizontal and vertical locations of underground utilities and appurtenances, referenced to permanent surface improvements.
 - .3 Measured locations of internal utilities and appurtenances, referenced to visible and accessible features of construction.
 - .4 Field changes of dimension and detail.
 - .5 Changes made by change orders.
 - .6 Details not on original Contract Drawings.
 - .7 References to related shop drawings and modifications.
- 5. Specifications: legibly mark each item to record actual construction, including:
 - .1 Manufacturer, trade name, and catalog number of each project actually installed, particularly optional items and substitute items.
 - .2 Changes made by Addenda and Change Orders.
- 6. Other Documents: maintain manufacturer's certifications, inspection certifications, field test records, required by individual specifications sections.
- 7. After the consultant has found the Redlined As-Built drawings to be acceptable, prepare digital pdf file of redlined Asbuilts Drawings to be included on CD or USB with other closeout documents.

9. Equipment and Systems

- 1. Each Item of Equipment and Each System: include description of unit or system, and component parts. Give function, normal operation characteristics, and limiting conditions. Include performance curves, with engineering data and tests, and complete nomenclature and commercial number of replaceable parts.
- 2. Panelboard Circuit Directories: provide electrical service characteristics, controls, and communications.
- 3. Include installed colour coded wiring diagrams.
- 4. Operating Procedures: include start-up, break-in, and routine normal operating instructions and sequences. Include regulation, control, stopping, shut-down, and emergency instruction. Include summer, winter, and any special operating instructions.

- 5. Maintain Requirements: include routine procedures and guide for trouble-shooting; disassembly, repair and reassemble instructions; and alignment, adjusting, balancing, and checking instructions.
- 6. Provide servicing and lubrication schedule, and list of lubricants required.
- 7. Include manufacturer's printed operation and maintenance instructions.
- 8. Include sequence of operation by controls manufacturer.
- 9. Provide original manufacturer's parts lists, illustrations, assembly drawings, and diagrams required for maintenance.
- 10. Provide installed control diagrams by controls manufacturer.
- 11. Provide Contractor's co-ordination drawings, with installed colour coded piping diagrams.
- 12. Provide charts of valve tag numbers, with location and function of each valve, keyed to flow and control diagrams.
- 13. Provide list of original manufacturer's spare parts, current prices, and recommended quantities to be maintained in storage.
- 14. Include test balancing reports as specified in mechanical specifications.
- 15. Additional Requirements: As specified in individual specification sections.

10. Materials and Finishes

- 1. Building Products, Applied Materials, and Finishes: include product data, with catalog number, size, composition, and colour and texture designations. Provide information for re-ordering custom manufactured products.
- 2. Instructions for cleaning agents and methods, precautions against detrimental agents and methods, and recommended schedule for cleaning and maintenance.
- 3. Moisture-protection and Weather-exposed Products: include manufacturer's recommendations for cleaning agents and methods, precautions against detrimental agents and methods, and recommend schedule for cleaning and maintenance.
- 4. Additional Requirements: as specified in individual specifications sections.

11. Guarantees, Warranties and Bonds

- 1. Separate each warranty or bond with index tab sheets keyed to the List of Contents listing.
- 2. List subcontractor, supplier, and manufacturer, with name, address, and telephone number of responsible principal. Use Guarantee/Warranty Form as provided in Section 01721

whenever standard preprinted trade or manufacturer's Guarantee/Warranty forms are not available.

- 3. Obtain warranties and bonds, executed in duplicate by subcontractors, suppliers, and manufacturers, within ten days after completion of the applicable item of work.
- 4. Except for items put into use with Owner's permission, leave date of beginning of time of warranty until the Date of Substantial Performance is determined.
- 5. Verify that documents are in proper form, contain full information, and are notarized.
- 6. Co-execute submittals when required.
- 7. Retain warranties and bonds until time specified for submittal.

End of Section

PART 1 - GENERAL

1.1 Related Work Specified Elsewhere

1. Not applicable

1.2 Existing Conditions

1. Take over structures to be demolished based on their conditions (on date that tender is accepted).

1.3 Demolition Drawings

1. Where required by authorities having jurisdiction, submit for approval drawings, diagrams or details clearly showing sequence of disassembly work or supporting structures.

1.4 Protection

- 1. Prevent movement, settlement or damage of adjacent grades. Provide bracing, shoring as required.
- 2. Prevent debris from blocking surface drainage inlets which must remain in operation.
- 3. Protect existing items designated to remain and materials designated for salvage. In the event of damage to such items, immediately replace or make repairs to approval of Owner and at not cost to Owner.

PART 2 - PRODUCTS

1. Not applicable.

PART 3 - EXECUTION

<u>3.1 Work</u>

1. Dispose of demolished materials except where noted otherwise.

3.2 Safety Code

- 1. Unless otherwise specified, carry out demolition work in accordance with Canadian Construction Safety Code 1980.
- 2. Should material resembling spray or trowel-applied asbestos be encountered, notify Architect. Any asbestos encountered will be removed by the Owner's Contractor.

3.3 Preparation

- 1. Disconnect electrical and telephone service lines entering areas to be demolished as per rules and regulations of authorities having jurisdiction. Post warning signs on electrical lines and equipment which must remain energized to serve other areas during period of demolition.
- 2. Inspect site and rectify with Architect items designated for removal and items to remain.
- 3. Disconnect and cap mechanical services in accordance with requirements of local authority having jurisdiction.
- 4. Natural gas supply lines to be removed by gas company or by qualified tradesman in accordance with gas company instructions.

3.4 Demolition & Field Work

- 1. Demolish areas as indicated on the drawings.
- 2. Remove existing equipment, services and obstacles, where required, for refinishing or making good of existing surfaces, and replace same as work progresses.
- 3. At end of each day's work, leave work in safe condition so that no part is in danger of toppling or falling. Protect interiors of parts not to be demolished from exterior elements at all times).
- 4. Demolish in a manner to minimize dusting. Keep dusty materials wetted.
- 5. Demolish masonry and concrete walls in small sections. Carefully remove and lower structural framing and other heavy or large objects.
- 6. Burning materials on site is not permitted.
- 7. Remove contaminated or dangerous materials from site and dispose of in safe manner.
- 8. Employ rodent and vermin exterminators to comply with health regulations.

3.5 Salvage

1. Carefully dismantle items containing materials for salvage and stock pile salvaged materials at locations as directed by Architect.

3.6 Restoration

- 1. Upon completion of work, remove debris, trim services and leave work site clean.
- 2. Reinstall areas and existing works outside areas of demolition to match condition of adjacent, undisturbed areas.

3.7 Scheduling

1. Demolition of areas adjacent to occupied spaces may not occur during occupancy of these spaces. Contractor to schedule the demolition of these areas to occur after school hours or weekends.

End of Section

1.0 General

- .1 Conform to all HDSB Part 'A' Outline and Instructions, Part 'B' Standard Terms and Instructions and any Appendices included within the Tender Documents.
- .2 Contractor to confirm window quantities shown on the Tender drawings are correct. Any miscount should be brought to the attention of the consultant prior to Tender submission.
- 2.0 Shop Drawings
 - .1 Upon notification, the Contractor shall have ten (10) days to supply to the Consultant four (4) sets of shop drawings of window superimposed over existing window opening clearly indicating materials and details for head, jamb and sill profiles of components and elevations of units, structural or reinforcing members, anchorage details, description of related components, exposed finishes, product types, quantities and proposed elevations. Electronic transmission/distribution also acceptable.

<u>Note</u>: The Consultant shall review shop drawings with the Contractor and indicate modifications where applicable. Only when the Consultant has indicated 'Reviewed' on the shop drawings shall the Contractor proceed with fabrication and installation of the project.

- .2 The Contractor shall indicate to the Consultant/Owner in writing the name of the project supervisor and verification of his experience of no less than five (5) previous institutional retrofit/replacement projects prior to installation commencement. Should the Consultant/Client not agree with the contractor's project supervisor choice, an alternate name will be provided by the contractor for approval by the Consultant and/or Owner.
- .3 Contractor to verify dimensions of existing openings prior to shop drawings and window fabrication.

3.0 Scope of Work – <u>Specific to this Section</u>

- .1 Removal of existing aluminum frames, operable sash and glazing. Supply and installation of all factory assembled and pre-finished extruded aluminum windows, complete with glass, glazing, weather-stripping, all required anchorages, attachments, shims and perimeter weather seals, as specified.
- .2 Supply/install window half-frames complete with glazed panels within the series of washroom windows designated as W5 & W6 within the East elevation.
- .3 <u>Removal, storage, re-installation and altering</u> of existing acoustical ceiling tiles and part of suspended ceiling system (if/where required) for the proper window frame replacement and intended operation of the operable window sashes.

- .4 Satisfactorily patch and repair any surrounding damaged areas and replace damaged materials <u>affected</u> by this contracted work.
- .5 Supply and installation of all necessary interior and exterior extruded aluminum trims to properly cover all excavated (uncovered) areas resulting from the removal of the existing window mainframes.
- .6 Supply and installation of required transition trims between interior walls/ partitions and new window frames (if required) to assist in limiting sound transfer between adjoining rooms.
- .7 Removal of existing window drapery and/or roller shades/tracks/brackets. Reinstallation, contact Faraday Window Fashions, Burlington ON. T: 905-632-3317.
- .8 Coordinate with the Board's suggested contact, the removal/replacement of electrical conduit located within the ground floor East & North elevation windows.
- .9 Remove any latent/broken glass, aluminum extrusion drops & filings to ensure clean/safe tarmac/grass areas. All refuse materials to be collected and deposited in the contractor's refuse bins or removed from site on a <u>daily</u> basis. <u>The use of school refuse containers are strictly prohibited.</u>
- .10 Contractor <u>MUST</u> provide tarpaulins and/or plasticized drop sheets in work areas on interior floors and over computers, books, bookshelves, etc. for containment of excessive dust and dirt during construction.
- .11 Contractor's site materials to be stored in contractor's trailers. Interior school classrooms or storage rooms will not be used for material storage purposes.
- .12 Apply sealants to all aluminum work as per specifications within.
- .13 On-site cleaning of all interior/exterior metal and glass surfaces. Preferred time for cleaning is prior to installation of caulking and heal-bead sealants.
- <u>Note</u>: Nothing contained herein, nor on the drawings shall be construed to relieve the contractor from making good and perfect, in all the usual details of construction, the work involved in the completion of this contract
- 4.0 Quality Assurance
 - .1 Qualifications The work of this section shall be designed, fabricated and installed by a company(s) with a minimum of five (5) years proven first class experience in this type of work, having adequate skilled personnel to complete the work in an efficient and very best workmanlike manner. Crew supervisor or foreman) must have five (5) years experience in a window installation management role for this project.

.2 Source Quality Control – Windows supplied under this specification shall have been tested by an independent testing agency indicating compliance with the present, up-to-date, performance requirements of the North American Fenestration Standard/Specification for Windows, doors and skylights

AAMA/WDMA/CSA 101/I.S.2/NAFS at the appropriate performance levels to meet climatic requirements and/or otherwise as specified herein.

Reference is also directed to the CSA/CAN-A440.M00 Canadian Omnibus Window Standard. Upon request, a valid copy of the product(s) Test Report(s) shall be issued to the Consultant/Client.

5.0 Submittals

.1 Test Reports

Test reports by an independent testing agency <u>may</u> be requested for the 'installation start-up' meeting. Once these reports are received they will be reviewed by the Consultant and/or client for perusal and comment.

Each window model design shall meet or exceed the performance requirements of North American Fenestration Standard/Specification for Windows, doors and skylights (AAMA/WDMA/CSA 101/I.S.2 /NAFS) at the levels indicated herein, i.e. infiltration, wind load resistance, water resistance, thermal performance, ease of operation, load test on screens, and blocked operation.

Where operating and fixed windows are used in the same opening to form a composite window, test reports must show conformance to AAMA/WDMA/CSA 101/I.S.2 /NAFS performance level C5 with respect to wind load resistance for an aluminum window composite mullion.

Test reports shall be considered incomplete if not accompanied by detailed drawings illustrating horizontal and vertical cross section of windows as submitted for third-party testing.

- .2 Certificates (if requested) Submit written certificate that windows to be furnished for this project are identical to windows subjected to testing to NSC Standard. Certificate shall be on manufacturer's letterhead signed by officer of company.
- .3 Maintenance Data and Operating Instructions
 - .1 On completion of work, supply 2 copies of maintenance and glazing instructions. Provide a demonstration with window manufactured for building maintenance staff dealing with operation of windows, insect screens removal, re-glazing, cleaning and general maintenance.

6.0 Warranty

Provide a written warranty upon notification of 'substantial completion' stating that aluminum windows are guaranteed against defect and malfunction under normal usage for a period of **ten (10) years on material and two (2) years labour** from date of the <u>entire</u> 'holdback' (invoice) release.

The Board reserves the right to conduct window testing by an independents agency as complete and installed assemblies during the retrofit procedure to confirm performance established under the AAMA/WDMA/CSA 101/I.S.2 /A440 standards. Cost of the initial test shall be borne by the Owner unless, tests results conclude that the windows and/or window components failed to meet required performance levels stipulated within this document at which 'test' costs will be on the Contractor's account.

Costs incurred in replacement, alterations, repairs and re-testing of windows shall be borne by the Contractor.

7.0 Window Performance Requirements

All on-site window performance testing conducted shall follow the procedures as stipulated within the Window Design Standard (AAMA/WDMA/CSA 101/I.S.2 /NAFS) with reference to the former CSA/CAN A440-M00 Standard.

All windows supplied will be tested for compliance of performance levels shown below and examined in the following areas for compliance of this specification.

- A) Air Leakage, A3
- C) Wind Load Resistance, C5
- E) Anodizing Finish,

- B) Water Leakage, **B7**
- D) Condensation Resistance Factor, I-55
- F) Heavy Duty Screen Strength
- G) Wall Thickness of Frame/Trim Materials

8.0 Products

- .1 Window Types The various school project drawings are based Windspec Inc. (905) 738-8311, Alwind Industries (905) 738-4266, and Alumicor Ltd. (416) 745-4222.
- .2 Sash, Frame and Screen Members Extruded aluminum alloy 6063-T6, minimum 1.6mm (0.062") thickness. Note: Frame components shall be 'one piece extrusions', i.e.; fins, tracks, guides, etc., may not be attached to mainframes.
- .3 Sealants (ALL MATERIALS TO BE ASBESTOS FREE) Exterior/Interior metal-to-metal, masonry, stone or porous materials – One part elastomeric sealant conforming to CAN/CGSB-19.13-M87, CWS by Dow Corning . Colour to match window frames.

Exterior /interior metal-to-metal and metal-to-glass joints – Silicone conforming to CAN/CGSB-19, 13-M82, CWS by Dow Corning. Colour to match window frame.

.4 Fasteners

To be countersunk flat head screws. All fasteners to be non-magnetic and corrosion resistant stainless steel to ASTM E-149.

.5 Insect Screens

Screens to be supplied for all operating sashes. Fly screens meeting CGSB 79-GP-1M and reference standard CSA/CAN-A440-M98 <u>rating heavy duty</u> shall consist of extruded aluminum frame having a wall thickness of 1.9 mm, with finish to match window framing. Screens supplied for horizontal sliding units to be located <u>between</u> the exterior and interior sash so that the screen is not exposed. Screen glides shall form an integral part of the thermal break or framing. Screen cloth shall be 18 x 14 aluminum mesh.

- .6 Spandrel Panels:
 - .1 Minimum 2mm thick consisting of clear anodized aluminum window half (depth) frame glazed with exterior of spandrel glass, standard shallow insulated back-pan or fabricated panel consisting of spandrel glass, insulation and interior face of .5 mm (0.020") painted aluminum sheet. All to be designed to engage in a manner maintaining air and vapour barrier in all required locations.
 - .2 Tolerances: panel bow: 0.2% of panel dimension, up to a maximum 5mm. Width or length: +/- 2mm from 1.2m to 2.4m. Squareness: maximum 5mm difference between diagonal measurements. Camber: maximum 1mm.
 - .3 Insulation: AF220 by Owens Corning or OF132 by Ottawa Fibre Inc or RXL 20 by Roxul Inc. minimum R13.3 value.
 - .4 Insulation clips: adhesive bonded pin and disc type: SkicKlip by Eckel or similar by Kelty or Dewar, or gun welded steel pin.
- .7 Upper insulated Metal Panels for i.e. electrical conduit or venting requirements to be 100 mm (4") thick, comprised of an exterior face of .5 mm (0.020") clear anodized aluminum sheet on 2.5 mm (0.100") tempered hardboard. Clear silicone heal beading to be applied to the exterior panel perimeters at frame and panel transition *laminated to a core of;*

Rigid polyisocyanurate insulation of CGSB 51-GP-21M, type 4, 30lgm/m3 (1.9 pcf) Density, having an 'R' value of 7.14/inch - *laminated to an inner face of;*

Aluminum sheet painted with thermosetting acrylic enamel, dry film thickness of 1.0 + - 0.2 mils of primer white paint on interior surface.

.8 Glass and Glazing Materials

All exterior glazing shall be 6 mm, tempered clear glass, Solarban 67 Low-E coating on inner surface. Interior glazing shall be 6 mm clear tempered glass.

Insulated glass units shall be 25mm (1") thickness to CAN2-12.3-M89 with exterior lite 6mm tempered clear glass, Solarban 67 Low-E coating on inner pane (2nd surface), 13mm Argon filled air space, inner lite 6 mm clear tempered glass. Washrooms window units to have interior obscure lite of Moroccan Pinhead to Can2-12.13-M89 (as required).

Spandrel Glass: Float glass, 6mm thick, tempered - painted with PPG Duranar "DTG", colour to be selected by client.

<u>Unless otherwise indicated</u>, glazing thickness to meet National Building Code requirements. Factory glazing set in wraparound virgin polyvinylchloride (PVC) glazing channel.

.9 Glazing Materials (ALL MATERIALS TO BE ASBESTOS FREE)

In colour to match sash. Compatibility of all materials is essential. Glazing compound to conform to CGSB 19-GP-2.

Urethane sealer to conform to CGSB/CAN2-19.13-M82, Vulkem 116 by Mameco. Glazing/gasket tape – Perma Stick #1351 @ 15lb. density Tremco "Polyshim".

.10 Glazing Accessories

Setting Blocks - Neoprene, Shore 'A' durometer hardness 70 to 90.
Spacer Shims - Neoprene, Shore 'A' durometer hardness 40 to 60.
Glazing Clips - As made available by window manufacturer.
Vision Strips - Grey, flexible PVC.
Sealed Unit Spacer – Warm Edge, non-metallic Super Spacer (aluminum spacer not permitted)

.11 Finish of Aluminum Components

Unless otherwise indicated, provide clear anodized AA-C22A31, Class 1, (.0004") minimum thickness, finish to match on all main, sash, frame and trim materials.

- 9.0 Fabrication.
 - .1 General

Fabricate windows using separate frames joined by means of a thermal break and as follows: Butt join all joints in main frame and sash neatly, in weathertight manner and secure by means of screws anchored into integral screw ports.

Secure sash corners with thread-cutting type screw to ensure tight corners when re-assembling after glass repairs have been made. Internally seal all sash corners.

De-burr and make smooth all sharp milled edges and corners of sash and screen frames. Provide tubular sections for all vertical sash rails, screen frames.

Provide sill members with minimum 5 degree positive slope away from the window main frame. Provide sill weep system that will facilitate drainage of water accumulating in sill area while preventing passage of air, dirt and insects to the interior.

Fabricate and anchor both inner and outer frames using specified screw fasteners without violating the thermo-barrier. Exposed fasteners or the use of pop rivets, **not acceptable**. Do not anchor window mainframe through bottom sill member of operable sash sections. Fabricate entire window in a manner that will allow easy replacement of any defective, damaged or worn components, hardware or weather-stripping.

<u>Note</u>: When composite window (operable frames, combined with sealed unit frames and/or architectural panel frames) are indicated, the voids between the joined horizontal and/or vertical frames shall be filled with approved insulating sealant. Composite windows may require additional 'stiffeners' to ensure sufficient rigidity. If requested, the window supplier shall present to the Owner, Engineered approved drawings of proposed composite windows indicating sufficient strength and rigidity in compliance with the O.B.C.

.2 Fixed Window Units

The fixed unit shall consist of two separate frames joined by means of a thermal break. All joints of the frame shall be butt type, joined neatly in a weathertight manner. The units shall be designed for filed glazing, using a combination semi solid/wet seal at the exterior weathering joint and a concealed screw applied stop with resilient gasket at the interior. The interior stop shall be extruded aluminum.

.3 Horizontal Sliding Sash

Completely separate all operating sash surfaces from metal-to-metal contact. Provide all <u>four</u> operable sash members with continuous, integral type pull handles. <u>Provide quiet, smooth sash operation using non-metal rollers concealed</u> <u>in sash bottom rails</u>. Provide sash with spring loaded metal locking device to provide automatic locking in closed position. All sashes shall operate and all sashes shall be easily removed from the interior for cleaning after removal of sash security/travel restrictors. .4 Bottom-Hung-Open-In (BHOI) Vent Windows:

Fabricate sash using two extruded components separated by means of a thermal break. Position vent sash on main frame to provide direction of opening specified, free and smooth operation, without binding or sticking against window mainframe members. Design ventilators for not more than 4" maximum opening. Equip each sash with two friction arms, spring catch and keeper to permit pole opening where sash <u>operating hardware</u> is more than 2.8 m (6ft) above floor level. Provide one operating pole for each individual room where high sash occur. Provide aluminum screens as specified.

.5 Thermal-Barrier

Extruded virgin polyvinylchloride thermal barrier.

Provide complete metal-to-metal separation between the two main frame members. Do not use connecting screws, clips or other devices that would tend to bridge the two frame members or restrict in any manner the expansion and contraction of the individual separate frame members.

- .6 Should the use of full depth window frames not be possible <u>within</u> the washroom series of windows frames located on the East elevation it will be necessary to supply window half-frame sections. In either case, supply blind panels within these subject frames.
- .7 Glazing Provide sash frames to permit glass replacement without the use of special tools.
- .8 Sealed Unit Spacer

Provide '<u>warm edge</u>' non-metallic Super Spacer product. Spacers shall be continuous with butt joints (if any) at corners only - pieces are not permitted. Butyl based or aluminum spacers <u>not</u> permitted.

.9 Sash Restrictors

Provide frame mounted sash travel (mechanical) restrictors for all exterior sashes limiting sash operation to a maximum opening of 4" as per O.B.C. requirements.

.10 Weather-Stripping

Polypropylene woven pile seal manufactured by Schlegal Company of Canada. Double weather-strip window units at all sash perimeters. Conceal weatherstripping to prevent accumulation of foreign matter due to cleaning, operation or handling which would reduce the effective life of the seal.

Install all weather-stripping in specially extruded ports and secure to prevent shrinkage, movement or loss when removing sash for cleaning or glass replacement.

.11 Exterior Panning

Extruded aluminum alloy 6063-T6, minimum 2.9 mm (0.078") thickness, providing one piece sections designed to slide and inter-lock into window frame. Join panning section at corners utilizing integral screw ports with screws back sealed on the interior side of framing.

.12 Interior Trims

Extruded aluminum alloy 6063-T6, minimum 1.5 mm (0.062") thickness. Provide extruded trims of sufficient size to neatly finish the window frame to the window opening. Seal all joints with specified sealants.

SHEET METAL FORMED SHAPES, EXPOSED INSTALLATION SCREWS, and NAILS OR POP RIVETS NOT ACCEPTABLE (<u>unless</u> otherwise instructed or shown on the tender drawings).

10.0 Installation

Install window in accordance with manufacturer's instructions, by approved or pre-qualified installers. Install window mainframes plumb, level and true relative to building structure. Do not exceed 3mm in 3,050 mm (1/8" in 10'-0") variation from plumb and level.

Prepare for glazing of glass by removing projections from glazing rebates and cleaning them of all materials that would adversely affect adhesion of sealers. Ensure that metal protection has been removed from rebates. Remove stops and store to prevent damage.

Do not set any glass without glazing beads or gaskets.

Position sealed unit glass in glazing openings with equal clearance on all sides. When glass lites are oversize, set them on two setting blocks at quarter points and use spacer shims, except at tapes and gaskets, on all four sides located a minimum of 300 mm from ends, spaced 600 mm o/c.

Stainless steel (#8) screws to be used when anchoring windows in final position. Do not install screws into sill area of operable sash sections.

<u>At no time</u> will anchoring be allowed through the window frame thermal break. Sealed units to be cap (heel-beaded) on exterior side with Tremco Proglaze one part silicone (or equal). Colour to match window framing or clear silicone.

From interior, install a barrier consisting of a single component polymeric insulating sealant to form a complete continuous bridge, full depth of the cavity between the window frame and existing building. Approved material: Hilti CB124 or Insta-foam NBS-7—or Ener Foam air barrier sealant by Abisko Manufacturing Inc. Foam to expand to a maximum of 25%.

Installation shall be inspected by the Owner or Consultant at the following stages:

- 1. Site confirmation of compliance with anodizing or other finish specified.
- 2. Frame perimeter sealant installation.
- 3. Sealed unit (fixed glazing) perimeter sealant (clear heel-beading) to be applied. Final glass cleaning to be completed just prior to this stage.

Trims, caps and caulking shall not be applied until the consultant has been given the opportunity to inspect said areas for tender specification compliance.

Interior trims shall be secured with mounting clips fastened at no less than 24" on center. If exterior panning is required, all butt joints shall be mechanically connected with removable panning clips, and shall be back sealed and made weather tight at butt joints. Window mainframe perimeter anchorage to be maximum of 24" on center.

Window frame thermal break shall be supplied non-perforated and remain so.

Initial on-site installation of a 'mock-up' window shall be supervised and approved by Owner and/or Consultant - contractor to coordinate.

Work will commence on the approval of the 'mock-up' window by the owner and/or consultant. Work will be undertaken during traditional summer month(s) school shutdown. The contractor or their sub-contractors are to coordinate the work schedule with all pertinent parties and cooperate with the consultant, school administration, custodial personnel and the school board representative(s).

All work areas to be cordoned off with a (minimum) 5ft. high mobile fence. Caution/safety signs are to be attached to fencing. Caution / NO Entry signage to be visible near work areas, i.e. classrooms, etc.

All installation personnel to adhere to Labour Board Safety Regulations with respect to their (PPE) personal protection equipment, i.e. on-site wearing of safety hats, safety shoes and fall arrest equipment if job-site conditions require.

During the installation process, the installation sub-contractor is asked to notify the Consultant of potential (daily) absence from the work site and reason(s) why. The installation foreman to furnish a valid/operable cell number in the event of necessary communication while travelling to/from the site & during the workday.

11.0 Caulking-Joint Depth

Provide the following depth-to-width ratios for caulking; Porous Materials: $\frac{1}{4}$ deep, up to $\frac{1}{2}$ wide $\frac{3}{8}$ deep, up to $\frac{3}{4}$ wide $\frac{1}{2}$ deep, up to 1" wide

Non-porous Materials: Joint depth and width must not be less than 1/4".

Examine joints before caulking to ensure that configuration, surface and width are suitable for sealant and service, and that execution of caulking and performance of sealants will not be adversely affected.

Gaps between panning and existing structure in excess of ¹/₄" shall be filled with foam backer rod of appropriate diameter, and/or single component polymeric foam sealant adhesive, prior to caulking.

The Consultant shall review gaps between window frames/extruded trims and the building structure in excess of 3/8" in width. Defective work resulting from application to unsatisfactory joint conditions will be rejected.

If possible - sealant (caulking) application to be scheduled on Fridays to allow sealant curing over the weekend.

Prime inner face surfaces of joints, as necessary for substrate in accordance with sealant manufacturer's specification in providing full adhesion and to prevent staining of face surfaces at joint(s). Fill joints with sealant in accordance with manufacturer's specification using pressure guns.

12.0 Cleanup

Clean glass at factory. Final cleaning of glass to remove job labels, site soiling, shipping tape residue, etc., shall be the responsibility of the Contractor.

Leave all aluminum surfaces reasonably clean, free of finger prints, sealants, caulking or other foreign materials. Remove surplus materials and debris from school premises, tarmacs & grassed areas resulting from work of this trade i.e. aluminum shavings, broken glass, etc., on a day-to-day basis. Contractor to provide their own company refuse container. The use of school refuse bins is prohibited.

Remove contractor's product storage trailers; refuse containers & unused materials from the project site A.S.A.P.

End of Section

The content of this specification is confidential and intended for information and guidance in the completion of this subject project. It is strictly forbidden to copy and/or share any part of this document with any third party without a written consent of KTS Consulting & Project Management Inc.

PHOTOGRAPHIC LOG



PHOTO #1 – VIEW OF PARTIAL NORTH ELEVATION WINDOWS



PHOTO #2 – VIEW OF PARTIAL NORTH ELEVATION WINDOWS

PHOTOGRAPHIC LOG



PHOTO #3 – VIEW OF ENTIRE NORTH ELEVATION WINDOWS



PHOTO #4 – VIEW OF PARTIAL EAST ELEVATION WINDOWS

PHOTOGRAPHIC LOG



PHOTO #5 - VIEW OF PARTIAL EAST ELEVATION WINDOWS



PHOTO #6 - (ALT) VIEW OF PARTIAL EAST ELEVATION WINDOWS

PHOTOGRAPHIC LOG



PHOTO #7 – VIEW OF PARTIAL EAST ELEVATION WINDOW



PHOTO #8 – VIEW OF SOUTH ELEVATION LIBRARY WINDOW

PHOTOGRAPHIC LOG



PHOTO #9 - EXTERIOR VIEW OF TYPICAL WINDOW @ HEAD / JAMB



PHOTO #10 - EXTERIOR OF TYPICAL WINDOW @ JAMB / SILL

PHOTOGRAPHIC LOG



PHOTO #11 -ELECTRICAL CONDUIT @ EAST WINDOW HEAD



PHOTO #12 - VIEW OF TYPICAL INSUL-PANEL DELAMINATION

PHOTOGRAPHIC LOG



PHOTO #13 - INTERIOR VIEW OF (EAST) WINDOWS @ HEAD / JAMB



PHOTO #14- INTERIOR VIEW OF (EAST) WINDOWS @ JAMB / SILL

PHOTOGRAPHIC LOG



PHOTO #15 - INTERIOR VIEW OF (NORTH) WINDOWS @ HEAD / JAMB



PHOTO #16 - INTERIOR VIEW OF (NORTH) WINDOWS @ JAMB / SILL
John T. Tuck Public School Burlington, ON. Window Replacement – 2021

PHOTOGRAPHIC LOG



PHOTO #17 – EXTERIOR VIEW OF LIBRARY WINDOW



PHOTO #18 – INTERIOR VIEW OF LIBRARY WINDOW

John T. Tuck Public School Burlington, ON. Window Replacement – 2021

PHOTOGRAPHIC LOG



PHOTO #19 - INTERIOR VIEW LIBRARY WINDOW @ MULLION



PHOTO #20 - LIBRARY WINDOW @ LOWER SECTION HEAD / JAMB

John T. Tuck Public School Burlington, ON. Window Replacement – 2021

PHOTOGRAPHIC LOG



PHOTO #21 – (ALT) INTERIOR VIEW @ LOWER WINDOW HEAD / JAMB



PHOTO #22 - LIBRARY WINDOW @ LOWER JAMB / SILL

End of Photographic Log - Jan. 2021

PART 1 - GENERAL

1.1 Reference Standards

- 1. Fabrication: to ASTM 365-78 and CAN/GSB-92.1-M77.
- 2. Installation: to ASTM C636-76, except where specified otherwise.

1.2 Design Criteria

1. Maximum deflection 1/360 of span to ASTM 365-78 deflection test.

1.3 Samples

1. Submit two each 12" x 12" samples of each individual tile and grid type in accordance with Section 01340.

PART 2 - PRODUCTS

2.1 Materials

- 1. Acoustic Panel Type (ACT-1)
 - 1. ACT-1: 610 mm x 1220 mm x 25mm, fine textured vinyl faced, square lay-in, Pebble #2989 by Armstrong. Suspension system: 15/16" Prelude MX, white, by Armstrong.
 - 2. Acceptable equal as manufactured by CGC.
- 2. **Exposed Tee Bar Grid Components:** Cold rolled steel, zinc coated, shop painted, satin sheen, white, interlocking, main and cross tee of double web with rectangular bulb, depth governed by span, 1" exposed face.
- 3. Hangers: 1/8" galvanized soft annealed steel wire. Maximum spacing 12.0 feet.
- 4. **Accessories:** splices, clips, retainers, etc., to complement suspension system components.

2.2 Installation

- 1. Co-ordinate suspension system with related components.
- 2. Install acoustic units parallel to building lines with edge unit not less than 50% or unit width.
- 3. Scribe acoustic units to fit adjacent work. Butt joints tight, terminate edges with moulding.
- 4. Support suspension system main runners at 48" oc maximum with hangers from structure. Assembly shall support super-imposed loads. Maximum permissible deflection, 1/360 of span.
- 5. Attach cross member to main runner to provide rigid assembly.

- 6. Install suspension assembly to manufacturer's written instructions.
- 7. Install flush edge moulding at junction of acoustic unit ceiling and other materials around entire length of joint. Secure to construction. Butt joints neatly, square and true in alignment.
- 8. Set acoustic units in place.
- 9. Set all ceiling levels by the use of transit or laser level.
- 10. Provide for Owner one (1) complete carton of each type of ceiling tile.

End of Section

PART 1 - GENERAL

1.1 Related Work

1. Not applicable.

1.2 Reference Standard

1. Ontario Painting Contractors Association (OPCA) Architectural Specification Manual - referenced as OPCA Manual, latest Edition. Paint formulations and methods referred to herein refer to this Manual. If contractor is unfamiliar with this reference standard, contact the OPCA.

1.3 Product Data

- 1. Submit to Architect, for review, product data for all formulas, including manufacturer's trade names.
- 2. Paint Manufacturer will provide periodic reviews and reports to Architect regarding work in this Section and if Contractor is adhering to manufacturer's product specifications.

1.4 Environmental Requirements

- 1. Do not apply paint finish in areas where dust is being generated.
- 2. Conform to requirements of OPCA Manual.
- 3. Comply with the requirements of Health and Environmental Specifications.

1.5 Extent of Painting

- 1. For new construction, for rooms shown in room finish schedule to have painted walls, paint all non prefinished surfaces unless indicated otherwise, and repaint prefinished surfaces where indicated.
- 2. For existing construction, for rooms shown in room finish schedule to have repainted walls:
 - Paint all non prefinished new surfaces unless indicated otherwise.
 - Repaint prefinished surfaces where indicated.
 - Repaint all previously painted surfaces unless indicated otherwise.

1.6 Finishes and Colours

1. Review the requirements outlined in Finish and Colour Notes. A separate colour schedule will be issued after contract award.

PART 2 - PRODUCTS

2.1 Materials

- 1. Acceptable products: Per Chapter 5 OPCA Manual as listed.
- 2. Paint materials for each paint system to be products of a single manufacturer.
- 3. Use low-VOC and low-odour paints only.

PART 3 - EXECUTION

3.1 Preparation of Surfaces in new Construction

- 1. Prepare surfaces to receive paint per Chapter 3 OPCA Manual.
- 2. Prepare wood surfaces to CGSB 85-GP-1M.
 - .1 Use CGSB 1-GP-126M vinyl sealer over knots resinous areas.
 - .2 Apply wood paste filler to nail holes and cracks.
- .3 Tint filler to match stains for stained woodwork.
- 3. Touch up shop paint primer on steel with CGSB 1-GP-40M to CGSB 85-GP-14M.
- 4. Prepare galvanized steel and zinc coated surface to CGSB 85-GP-16.
- 5. Prepare wallboard surfaces to CGSB 85-GP-33M. Fill minor cracks with plaster patching compound.

3.2 Preparation of Previously Painted Surfaces

- 1. Remove screws, bolts, nails, etc. from all surfaces to be painted
- 2. Remove all peeling and scaling paint by scraping and sanding.
- 3. Remove loose and broken pieces. Fill all holes, cracks and crevices with appropriate patching compound and match surrounding texture. Touch-up with appropriate primer.
- 4. Remove all dirt, grease, oil, wax and other contaminants by scrubbing with a detergent solution such as trisodium phosphate. Rinse with clean water.
- 5. All metal surfaces must be washed with mineral sprits. Change solvent and rags frequently. Remove all rust by sanding. Prime with rust inhibitive paint.
- 6. Dull all glossy surfaces by sanding.
- 7. Wash with solvent surfaces that have been subject to writing with marking pens, crayons, or lipsticks. Prime to stop bleeding.

8. For joints within or adjacent to exterior areas to be painted or cleaned, remove old cracked and loose caulking and replace with a high quality caulking compound.

3.3 Application

- 1. Sand and dust between each coat to remove defects visible from distance up to 60".
- 2. Finish closets and alcoves as specified for adjoining rooms.
- 3. Apply each coat at the proper consistency. Each coat of finish should be fully dry and hard before applying the next coat, unless the manufacturer's instructions state otherwise.

3.4 Mechanical and Electrical Equipment

- 1. Paint exposed conduits, pipes, hangers and other mechanical and electrical equipment occurring in finished areas as well as inside cupboards and cabinet work. Colour and texture to match adjacent surfaces, except as noted otherwise. Coordinate with mechanical trades applying banding and labeling after pipes have been painted. <u>Do not paint</u> white PVC covers on exposed mechanical water, drain and other lines
- 2. Paint gas piping standard yellow where visible on roof or in service spaces.
- 3. Paint surfaces inside of ductwork and elsewhere behind grilles where visible using primer and one coat of matte black paint.
- 4. Paint both sides and edges of plywood backboards for equipment before installation.
- 5. Leave equipment in original finish except for touch-up as required, and paint conduits, mounting accessories and other unfinished items.

3.5 Paint Systems

1. System references listed are based on Chapters 4A and 4B of OPCA Manual and are OPCA Premium Grade, unless noted otherwise.

3.6 Interior Finishes

- 1. Wood, where applicable: INT. 1-A, Alkyd Semi-Gloss Finish, Premium Grade.
- 2. Gypsum board Ceilings and bulkheads INT. 4-A, Alkyd Flat Finish, Premium Grade.
- 3. Gypsum board walls: JNT4A, Alkyd eggshell, Premium Grade.
- 4. Concrete Block: INT. 8-B, Alkyd Semi-Gloss Finish, Premium Grade.
- 5. Galvanized metal: INT. 13-A, Alkyd Semi-Gloss Finish, Premium Grade.

3.7 Refinishing of Previously Painted Surfaces

- 1. Apply two (2) finishing coats of paint materials listed in Section 3.5 and 3.6 for the type of surface considered.
- 2. When satisfactory coverage can be achieved by only one (1) coat, the second coat is not required.
- 3. Apply additional coats if necessary to cover accent colours, graphics, etc.

End of Section

PART 1 GENERAL

1.1 **REFERENCES**

.1 Division 1, General Requirements, is a part of this Section and shall apply as if repeated here.

1.2 APPLICATION

.1 This section applies to and is a part of all Sections of Division 16.

1.3 WORK INCLUDED

.1 Sections of these Electrical Specifications are not intended to delegate functions nor work and supply to any specific trade and the work shall include all labour, materials, equipment and tools required for a complete and working installation as described.

1.4 INTENT

- .1 Mention herein or indication on drawings of articles, materials, operations or methods requires: supply of each item mentioned or indicated, of quality, or subject to qualifications noted; installation according to conditions stated and; performance of each operation prescribed with furnishing of necessary labour, equipment and incidentals for Electrical Trade, Division 16.
- .2 Supplementary to definitions established are: `Supply' shall mean furnishing to site in location required or directed complete with accessory parts. `Install' shall mean set in place and secured or affixed to building structure as noted or directed. `Provide' shall mean supply and install as each is described.
- .3 Where used, wordings such as "approved, to approval, as directed, permitted, permission, accepted, acceptance", shall mean: approved, directed, permitted, and accepted, by authorized representative of the Owner.
- .4 Equipment and installation provided under this Division shall conform to applicable standards and regulations of the following organizations:

Canadian Standards Association (CSA) Underwriter's Laboratories of Canada (ULC) Ontario Electrical Safety Code (OESC) Electrical Safety Authority (ESA) Ontario Building Code (OBC)

1.5 WORKMANSHIP

.1 Workmanship and method of installation shall conform to best standards and practice. Where required by local or other By-Laws and Regulations, tradesmen shall be licensed in their trade.

1.6 TEMPORARY & TRIAL USAGE

.1 Temporary or trial usage of any equipment or materials shall not be construed as evidence of acceptance of same and no claim for damage shall be made for injury to or breaking of any part of such work which may be so used.

1.7 BY-LAWS & REGULATIONS

.1 Work shall conform to the latest rules, regulations and definitions of the Canadian Electrical Code and applicable Municipal and Provincial Codes and Regulations, and with requirements of other authorities having jurisdiction in the area where work is to be performed. Minor changes required by an authority having jurisdiction shall be carried out without change to the Contract amount. Standards established by drawings and specifications shall not be reduced by applicable codes or regulations.

1.8 PERMITS & FEES

- .1 File Contract Drawings with proper authorities and obtain their approval of installation and permits for same before proceeding with work. Prepare and submit necessary detailed shop drawings as required by Authorities.
- .2 Pay all fees in connection with examination of drawings, permits, inspections and final certificate of approval.

1.9 CERTIFICATES

.1 Finish necessary certificates as evidence that work installed conforms to laws and regulations of authorities having jurisdiction.

1.10 GUARANTEE-WARRANTY

.1 Guarantee and warranty requirements of the Contract shall apply except for incandescent lamps which shall be guaranteed for a period of ninety days after acceptance by the Owners.

1.11 SPECIFICATIONS, DRAWINGS, AND JOB CONDITIONS

.1 Electrical Drawings do not show structural and related details. Take information involving accurate measurement of building from building drawings, or at building. Make, without additional charge, any necessary changes or additions to electrical work or equipment locations to accommodate structural conditions. Equipment locations may be altered by Engineer without extra charge provided change is made before installation and does not necessitate major additional material.

- .2 Examine site and local conditions. Examine carefully all drawings and complete specifications to ensure that work can be satisfactorily carried out as shown. Before commencing work, examine the work of other Sections and report at once any defect or interference affecting the work, its completion or warranty. No allowance will be make later for any expense incurred through failure to make these examinations or to report any such discrepancies in writing.
- .3 Relocate equipment and/or material installed but not coordinated with work of other Sections as directed, without extra charge.
- .4 Furnish "built-in" items in ample time and give necessary information and assistance in connection with building-in of same. Notify Section concerned in writing of size and location of recesses, openings and chases at least 48 hours before walls are erected, floors poured and similar work.

1.12 TENDER & SUBSTITUTIONS

- .1 Tender shall be submitted based on specified manufacturer or "approved manufacturers" and equipment only.
- .2 Substitutions for materials may be proposed by submitting details with Supplementary Tender Form together with price difference to Stipulated Sum Tender amount under the following conditions:
 - 1. Product name shall be stated together with price difference, if any, to stipulated sum for each substitution proposed.
 - 2. Material or equipment substituted shall not exceed space requirements allocated. Extra charges will not be allowed for any additional installation cost resulting from acceptance of proposed substitutions.
 - 3. If an item of material specified is unobtainable or unavailable to meet proposed completion, state in tender the proposed substitute and amount to be added or deducted for its use. Extra charges will not be allowed for substitutions after the Contract has been awarded.

1.13 INTERFERENCE DRAWINGS

- .1 Prepare and submit composite interference drawings if required to avoid and/or resolve conflict of trades and to co-ordinate work of Electrical Division with all other trades.
- .2 Interference drawings shall indicate exact arrangements, of all areas and equipment to scale with dimensions.
- .3 Co-operate with work of Division 15 and provide data requested and as required in the preparation of interference drawings for the work of Division 15.

- .4 Make interference drawings in conjunction with all parties and trades concerned showing sleeves and openings and passage of electrical work through building structure. Drawings shall also show inserts, special hangers and other features to indicate routing through confined spaces, installation of equipment in such areas.
- .5 Provide detail drawings, fully dimensioned, of equipment in Boiler and Mechanical Equipment Rooms, Electrical Rooms, Fan Rooms, etc. Base equipment drawings on approved Shop Drawings and include, but do not necessarily limit to, details pertaining to access, clearances, sleeves, connections, etc.
- .6 Provide detailed drawings of pulling pits, equipment bases, anchors, floor and roof curbs, etc., pertaining to Electrical work.

1.14 SHOP DRAWING MATERIAL & LISTS

- .1 Prepare and submit shop drawings and lists of materials for review in accordance with Architectural Sections. Make submittals of more than two pages in booklet form. Individual and loose drawings will not be accepted for review.
- .2 Prior to equipment fabrication, delivery or installation, submit complete lists of materials proposed, indicating manufacturer, catalogue numbers and complete performance data.
- .3 Review of Shop Drawings by Consultant is for sole purpose of ascertaining conformance with general design concept. This review shall not mean that Architect and/or Engineer approves detail design inherent in Shop Drawings, responsibility for which shall remain with Contractor and such review shall not relieve Contractor of his responsibility for meeting all requirements of Contract Documents. Contractor is responsible for dimensions to be confirmed and correlated at site, for information that pertains solely to fabrication processes or to techniques of construction and installation and for co-ordination of work with all trades.
- .4 Shop drawings transmitted via facsimile (fax) machines, or copies of same, will not be accepted for review.

1.15 RECORD DOCUMENTS

- .1 Conform to General Requirements. Maintain at least 2 sets of documents and clearly mark on same as job progresses, changes and deviations from work shown so that on completion Owner will have records of exact location of ducts and equipment and record of material and equipment changes.
- .2 Record all homerun conduits, junction boxes for complete lighting, power and systems on As-Built Drawings.
- .3 Contractor shall obtain clean set of prints from Consultant at start of Contract Work and shall keep these prints up-to-date at jobsite, accurately recording all changes made on project and locating all services, equipment, etc. which may have been shown only diagrammatically on Contract Documents.

- .4 Contractor shall ensure that as-built information is accurately recorded and shall check same. As-Built drawings shall be reviewed with Consultant at each jobsite meeting.
- .5 Upon completion of Contract Work, prior to Substantial Performance inspection and after final review with Consultants, Contractor shall neatly transfer recorded information and make final As-Built submission to Consultant in the following form:
 - One (1) set of clean, legible prints.
 - Updated AutoCAD 2017 drawings.
- .6 Consultants shall be responsible for reviewing As-Built information provided by Contractor. Revise drawings to suit any comments until acceptable for submission to owner.

1.16 JOB SITE WORK SHOP AND STORAGE

.1 Supply job site office, workshop, tools, scaffolds and material storage as required to complete the work of this Division. Location of temporary buildings, use of space on site or within building shall be to later direction.

1.17 PROTECTION

- .1 Securely plug or cap open ends of electrical raceways or equipment to prevent entry of dirt, dust, debris, water, snow or ice. Clean all equipment inside and outside before testing.
- .2 Equipment stored on site shall be protected from weather and kept dry and clean at all times. Take care to avoid corrosion of metal parts.
- .3 Protect work installed from damage. Secure all unfinished or loose work to prevent movement.

1.18 INSTRUCTIONS TO OPERATOR

- .1 Instruct Building Operators in repair, maintenance and operation of Electrical Systems and associated equipment.
- .2 Supply three (3) full Operation and Maintenance Instructions each in stiff cover, three-ring binder suitably indexed, separated and labeled. Operate each item of equipment in presence of Operators to ensure understanding of working parts and function of each item of equipment. Supply one complete set of "Reviewed" Shop Drawings in separate hard cover binder suitably separated and labelled for Owner's use.
- .3 Operation and maintenance manuals shall be carefully prepared in co-operation with equipment manufacturers and include miscellaneous parts necessary for proper, efficient operation of all equipment.

.4 Manuals shall also include spare parts list for each type of equipment, component, control and device installed together with manufacturer's name and address so such items can be suitably identified and purchased. Include list of recommended spares.

1.19 CLEANING, LUBRICATION AND ADJUSTMENT

- .1 Immediately prior to completion of work:
 - 1. Remove all dust, dirt and other foreign matter from internal surfaces of enclosed electrical apparatus and equipment.
 - 2. Remove all temporary protective coverings and coatings, temporary labels.
 - 3. Clean, repair, lubricate and adjust all mechanism and moveable parts of apparatus and equipment leaving it in new condition and operating properly.
 - 4. Balance demand loads for service and distribution feeders within 5 percent upon completion of work and after the building is in full operation.

1.20 INSPECTION & TESTING

- .1 Systems, equipment, and all major items of material shall be tested to the satisfaction of the Architect, and as required to establish compliance with plans and specifications, and with the requirements for the Supply and Inspection Authorities.
- .2 Faulty and defective equipment shall be replaced with new materials. Conductors which are found to be shorted or grounded, or to have less than proper insulation resistance, shall be replaced with new conductors.
- .3 Tests shall include but are not limited to the following:
 - 1. Test of secondary voltage cables shall include megger tests to establish proper insulation resistance, and phase-to-ground resistance of cables.
 - 2. Proper functioning of all systems.
 - 3. Polarity tests to establish proper polarity connections to all sockets and receptacles.
 - 4. Test of system neutral to establish proper insulation resistance and isolation of neutral from ground except for required ground connection at Service.

1.21 CERTIFICATE OF TESTS

.1 When work is complete submit three copies of test results and a signed statement listing all tests that have been performed as required by specifications and manufacturer's instructions.

1.22 COMPLETION

- .1 Provide receipts from designated representative of Owner for portable and loose materials (e.g. spare fuses, fixture re-lamping equipment and the like).
- .2 Provide copy of final inspection certificate from Electrical Inspection Authority and fire alarm verification report.
- .3 Provide manufacturers corrected "as built" shop drawings for all major electrical items and systems, including all shop drawings returned for modifications.

1.23 ALTERATIONS TO EXISTING BUILDING

- .1 Note that certain alterations and structural changes are to be made to existing building. Architectural drawings and site are to be examined to determine extent of alterations affecting existing electrical systems. Where existing conduits and wires run through areas to be altered, to feed other parts of existing building, they shall be re-routed and reconnected to maintain their original function. Drawings do not necessarily indicate outlets, switches, receptacles, and the like, and other electrical equipment which are required to be relocated or abandoned. Provide decorative blank cover plates for obsolete outlet boxes remaining.
- .2 Electrical services and auxiliary services (fire alarm, P.A. intercom, and the like) shall be maintained continuously without interruption. Interruptions to services shall be confined to periods of time to be designated by Architect, and/or Owner's designated representative. Include in tender for temporary connections, overtime labour charges, and such related allowances in order to conform to these conditions.
- .3 The Electrical Contractor is responsible for removal, reinstallation, cutting and patching of ceiling and walls as required in the existing building.
- .4 Cutting directly related to electrical work, <u>regardless of whether such work occurs in new</u> <u>or existing construction</u>, shall be coordinated and paid for by Electrical Sub-Contractor involved, under supervision of Contractor.
- .5 Where existing electrical items or systems are demolished and removed from existing construction assemblies, Electrical Sub-Contractor involved shall be responsible for infilling entire hole left after removal of item or system with new construction assembly to match existing. Where new electrical items or systems are installed through existing construction assemblies, Electrical Sub-Contractor involved shall be responsible for properly sized and accurate cutting of existing construction assembly to allow installation of new work.

1.24 PROJECT SPECIFIC NOTES

.1 Obtain all approvals from public authorities having jurisdiction prior to commencing any work. Include, in the tender price, for all ESA permit and inspection fees. Arrange for and

attend all inspections required as per requirements of the electrical safety authority and the building department.

- .2 Examine architectural drawings and specifications and all contract documents before proceeding with the work. Any discrepancies between the drawings and specifications of all disciplines must be referred to the architect before any affected work is commenced.
- .3 The electrical Contractor shall furnish all labour, material, tools, equipment, etc. required to complete all work shown on the drawings and as specified in the contract documents. The work shall be performed in accordance with rules and regulations of all authorities having legal jurisdiction over the work. This Contractor shall provide any small items of work not specifically called for but required to complete the intended installation and/or required to achieve the desired intent or functional utility.
- .4 Perform all work in full accordance with the Ontario Building Code, Ontario Electrical Safety Code, HDSB standards and good practices and the requirements of all other authorities having jurisdiction. All work performed by this division shall be done in accordance with all manufacturer's recommendations. Obtain all available manufacturer's recommendations and comply.
- .5 All cutting, patching, coring, scanning, xraying, making good and fire stopping required for the work of this division shall be carried out by this division. The electrical Contractor is responsible for and shall pay for any and all damage to the building and/or surrounding area incurred by work of this division.
- .6 Review the Designated Substances Survey provided by the Board in detail prior to commencing any work.
- .7 The Electrical Contractor must review and submit shop drawings for the proposed door hardware in conjunction with the general Contractor to the architect and electrical consultant prior to ordering. Order only upon receipt of approval. Order, supply and install as per all comments.
- .8 All materials used throughout shall be new, of best quality, C.S.A. approved, and of one manufacturer. Wherever trade names are not used to describe materials, these materials shall be of the best available quality. Obtain and pay for special ESA inspections of specified non-C.S.A. electrical equipment.
- .9 Provide all wiring, raceways, electrical boxes, and such components as required for a complete and operational installation.
- .10 All conduit shall be rigid steel or EMT with gland watertight connectors and compression type couplings (cast fittings/set screws not acceptable) to be forced steel, unless otherwise noted. Conduit connectors shall be provided with factory-installed insulated throats. Exposed raceways in finished areas shall be wiremold channels installed neatly in appearance, run parallel to building lines, and concentric right angle bends only shall be used. Exterior exposed conduit shall be rigid galvanized steel. Supply and install access doors as necessary due to the proposed work. All access panel ratings shall match that of the surface in which it is being installed.

- .11 All wiring shall be of minimum #12 gauge copper, except as otherwise noted. All wiring shall be 600 Volt type RW90. All wiring shall be run in conduit from the source to the load. BX cable may be used where permitted by code in ceiling space for final connections only and for a maximum length of 5'. Maximum voltage drop shall not exceed 2 percent.
- .12 Coordinate with all other trades present on site throughout the full course of construction. Lay out of all work so as not to conflict with the work of other trades. Carry out work promptly which may interfere with the work and/or schedule of any other trades.
- .13 After completion of the work, provide the consultant with a set of 'as-built' record drawings in PDF and CAD format prior to submission to the owner. Incorporate all changes in the pdf drawings.
- .14 Alterations and additions: Contractors shall note that this contract is an alteration to an existing building and as such the Contractor shall thoroughly investigate the existing electrical installation and electrical, mechanical, structural, and architectural conditions prior to pricing and construction.
- .15 Demolition: remove all exposed conduits, branch wiring, outlets, etc. from surfaces being demolished.
- .16 Cleanup and garbage: the Contractor is responsible for maintaining as clean of a work area as possible during construction. The Contractor is responsible to clean-up and remove tools from the site at the end of every working day. Disposal of all redundant materials, devices, and equipment is the responsibility of the Contractor on a daily basis.
- .17 All work shall be done with minimum possible interruption to the existing building systems and in the time schedule permitted by the school board. Consult with the Project Manager prior to pricing. Complete the project within the allocated schedule.
- .18 Paint all exposed conduit and backboxes, inside and outside of the building, to match the surrounding colour. Minimize exterior conduit run where feasible.
- .19 All backboxes installed indoors shall be wiremold or approved equal. All backboxes installed outside shall be of cast aluminum finish.
- .20 For all panels where new circuits are added, provide a new typed panel directory based on the new loads. Incorporate all existing circuit information from the existing panel directory on site in the new panel directory.

1.25 CLOSEOUT DOCUMENTS

.1 Coordinate with the General Contractor to submit a comprehensive Closeout Document Package stating incorporating documents from all trades in one consolidated package. Closeout Documents shall consist of one (1) 3-ring binder hard copy and 3 USBs/CDs. The Electrical Section of the Closeout Documents shall consist of the following:

- (a) Electrical Contractor Warranty Letter, signed and dated. Warranty shall be for a period of twelve (12) months starting on the Date of Substantial Completion.
- (b) ESA Inspection & 'Final' Certificates.
- (c) Fire Alarm Verification Report from the Fire Alarm Manufacturer.
- (d) Fire Alarm Installer Letter.
- (e) Emergency Lighting Letter, confirming testing and stating continuous operation of all emergency lighting affected by this project for no less than 30 minutes.
- (f) Operations & Maintenance Manuals for all new Devices/Equipment
- (g) Red-Line As-Builts (completed by the Electrical Contractor).
- (h) CAD As-Builts (completed by the Electrical Contractor).

END OF SECTION

SURI & ASSOCIATES LTD. BASIC JOHN T. TUCK PUBLIC SCHOOL CEILING & LIGHTING REPLACEMENT 3365 SPRUCE AVENUE, BURLINGTON, ONTARIO. L7N 1J7.

PART 1 GENERAL

1.1 REFERENCES

.1 Conform to Section 16010 - Electrical General Requirements.

1.2 MATERIALS

- .1 Materials shall be new, of Canadian manufacture where available, first quality and uniform throughout. Submit tender based on the use of materials and equipment specified, or on the listed acceptable alternate equipment as further detailed.
- .2 Electrical materials shall be C.S.A. approved and be so labeled. Material not C.S.A. approved shall receive acceptance for installation by Electrical Safety Authority (ESA) Special Inspections Branch before delivery, and modifications and charges required for such acceptance shall be included in work of this Section. Material shall not be installed or connected to the source of electrical power until approval is obtained.
- .3 Confirm capacity, ratings and characteristics of equipment items being provided to supply power to equipment provided under other Sections of the work. Resolve discrepancies before such items are purchased.

1.3 MATERIAL ACCEPTANCE

- .1 Acceptance of materials installed presumes that materials have not been damaged or exposed to conditions that would adversely affect performance and life expectancy.
- .2 If in the opinion of the Consultant, materials have sustained damage, or have been exposed to abnormal conditions it shall be the responsibility of the Contractor to have such tests performed as deemed necessary by the Consultant to establish condition and therefore, acceptability of installed materials.

PART 2 PRODUCTS

2.1 RACEWAYS

- .1 Rigid galvanized steel conduit shall comply with CSA Specification C22.2 No. 45.
- .2 Electrical metallic tubing (EMT) shall comply with CSA Specification C22.2 No. 83. Connectors and couplings to be forged steel and rain tight in sprinklered areas. Connectors to have factory-installed insulated throats.
- .3 Rigid PVC conduit shall comply with CSA Specification C22.2 No. 136.
- .4 Watertight flexible conduit: "Sealtite" PVC jacketed flexible steel with Hubbell-Kellum strain relief grips; shall comply with CSA Standard C22.2 No. 56.

.5 Surface wall-mounted raceways shall be Wiremold No. 4000 metallic type complete with two channels and all necessary fittings, closers, device modules, etc. Wiremold or approved equal only.

2.2 WIRE & CABLE

- .1 Branch wire and cable shall comprise copper conductors, sized as noted, rated 75 deg. C., 600 volt minimum flame retardant insulation, and CSA approved for application.
- .2 Wire and cable installed in conduit shall be PVC insulated Type TWH Flame retardant and comply with CSA Specification C22.2 No. 75.
- .3 Use Electrovert "Z-Type" code markers for control & communication conductors.
- .4 All branch wiring shall be RW90.

2.3 **DEVICES**

- .1 Wiring devices unless otherwise specified herein, or noted, shall be as manufactured by Hubbell, Leviton or Pass & Seymour.
- .2 Switches for 120 volt branch lighting circuits, generally shall be A.C. "Quiet Type" rated 20 Ampere, 120 Volt, totally enclosed phenolic housing Hubbell 1200 Series, beige toggle handle.
- .3 Double Pole lighting switches shall be connected to 2 pole circuit breakers.
- .4 Key-operated switches shall be Hubbell 1221-L Series of the types listed above, except key-operated, and shall be keyed-alike.
- .5 Standard 15 Ampere, 125 volt duplex receptacles generally shall be specification grade Hubbell Cat. No.5262, beige, CSA #5-15R.
- .6 Receptacles with integral ground fault interrupter shall be Hubbell No. GF-5252 or approved equal.
- .7 Service receptacle shall be Hubbell No. 5262-RD.

2.4 DEVICES-SPECIALIZED

- .1 Flush floor boxes shall be Hubbell Cat. No. 3SFB-SSC 3-service box complete with devices shown on drawings.
- .2 Provide low-voltage lighting control, as detailed.

2.5 DEVICE COVER PLATES

- .1 Switch and receptacle and other device faceplates for flush mounted devices, generally shall be single or multi-gang as required, type 301, stainless steel, #4 brushed finish with removable protective covering.
- .2 Weatherproof enclosures for outdoor receptacles shall be P & S 4600 with 4600-26 Mounting Plate, duplex ground fault receptacles and two #4609 Keys.
- .3 Cover plates for other devices such as flush fan controls, telephone, etc., shall be stainless steel to match above.

PART 3 EXECUTION

3.1 EQUIPMENT LOCATIONS

- .1 Approximate locations of electrical equipment, fixtures switches, outlets, and the like, are given on the drawings. Refer to the architectural drawings and room elevations for application. In absence of definite detail exact location of outlets shall be determined on site as work progresses.
- .2 Device plates shall cover opening left for outlet box, and plates shall be attached to boxes in an approved manner. Outlets and fixtures are to be located symmetrically, (i.e. centered in wall panels, ceiling panels or tiles, columns, between and above doors and the like).
- .3 The right is reserved to alter the location of equipment and outlets a distance of up to 3 metres without involving a change to the Contract amount, providing notice is given prior to installation.

3.2 MOUNTING HEIGHTS

.1 Mounting heights of outlets, top of outlet to finished floor, except for exposed masonry construction, shall generally be as follows:

Lighting/Exhaust Fan Switches - 1100 mm (to the center of the switch) Receptacles - 400 mm above finished floor Television Outlets - 400 mm Telephone Outlets - 400 mm Manual Fire Alarm Pull Stations - 1100 mm to the middle of the Pull Station. Panelboards - 2000 mm to top of trim for standard panels. Clocks - 2000 mm or 300 mm below ceiling. Thermostats - 1200 mm Fire Alarm Audible Temporal Pattern Horn/Strobes – 2300 mm

3.3 HOLES & DRILLING

.1 Pneumatic hammers and percussion drills are prohibited.

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Seal holes and sleeves through floors to serve as water dam. .3

3.4 **CUTTING & PATCHING**

- Layout and install work in advance of other Sections for all new work. Bear all costs .1 resulting from failing to comply with this requirement.
- .2 Pay for cutting and patching and making good as required for work of this Division by reason of faulty or late work. Employ appropriate trades already engaged on the site to perform such cutting, patching and making good existing walls, floor, ceiling, etc. Before commencing, obtain Architect's approval for extent and nature of cutting. Make good, disturbed surfaces to the Architect's approval.

HANGERS & INSERTS 3.5

- Provide necessary hangers and inserts for work of this Division. .1
- .2 Fasten to cast-in place concrete by suitable drilled or cast-in inserts.
- .3 Fasten to structural steel using bolts or welded fasteners.
- .4 Do not use wood, chain, wire lashings, strap or grappler bar hangers except where noted or detailed.
- .5 Support fixtures independently of ceiling suspension systems. Provide additional supports as required, which shall be fastened to building structure steel members, joists, beams, etc., but not metal pan or roof decking. Material for additional supports and their installation shall comply with requirements of U.L.C. Refer to "List of Equipment and Materials" Vol. 2, and "Supplement" for application to rated assemblies.
- .6 Support outlet and junction boxes independently of the conduits running to them where required by electrical code and where deemed necessary by the Architect, use steel angle brackets or steel rods to support outlets and fixtures, to the building structure.
- .7 Drilled fastenings to concrete shall be self-drilling concrete anchors, Phillips 'Red-Head' or approved equal. The maximum weight per fastening shall not exceed 25% of manufacturer's 'pull-out' load data.
- .8 Surface mounted or stem suspended fixtures fastened to non-removable ceilings, 2 hr. fire rated ceiling assemblies, or mounted between metal suspension of exposed T-grid ceilings, shall be provided with minimum of two points of attachment for each 300 mm x 1200 mm (1' x 4') luminaire, using metal `channel-bar' fastened to building structure. Attach luminaires to `channel-bar' by means of threaded steel rods. Channel-bar shall be adequately supported and of a construction to prevent deflection under load, as selected

from manufacturer's published data, and to Architect's approval. `Channel-bar' shall be Unistrut, Burndy, Flexibar, Cantrough, or Canadian Strut Products or approved equal.

- .9 Use support clips (e.g. Caddy Type IDS) for suspension of fixtures attached to exposed T-grid ceilings. Clips shall be supported directly from building structure and not from suspended ceiling system.
- .10 Provide recessed fluorescent fixtures with support frames, and plastering frames where applicable.
- .11 Chain where permitted and specified for the installation of fluorescent lighting fixtures shall be No. 4, 2 mm (.080") Tenso Pattern coil steel chain, plated with a strength of 82 kg (180 lbs.) as manufactured by Dominion Chain Co. Ltd. or approved equal. Where 'S' hooks are used with chain, they shall be No. 6 type with open strength of 82 kg (180 lbs.) minimum. Attachment of chain at both ends of support shall develop full strength of chain.
- .12 Support outlet boxes, junction boxes, conduit and the like, mounted on exposed steel deck roofing by means of self-tapping minimum #10 gauge screws, secured through bottom member of deck corrugation. Do not pierce top of steel deck.

3.6 PAINTING

- .1 Hangers, support framing and all equipment fabricated from ferrous metals which are not protected with zinc or other suitable corrosion-resistant finish shall have at least one coat of a corrosion-resistant paint applied before shipment or immediately on arrival at the site.
- .2 After installation, touch up all scratches, chips, other damage and defects in paint, using zinc chromate primer or paint or special enamels as necessary to match the original.
- .3 Finish and colour of all equipment shall be coordinated to provide uniform appearance.
- .4 Painting of conduits and supports and other exposed surface work will be done under Painting Section except as noted. Install materials in time to be painted together with mounting surfaces.
- .5 Do not paint over nameplates.
- .6 Refer to other Sections for special paint finishes of equipment.

3.7 NAMEPLATES & SCHEDULES

.1 Identify electrical equipment supplied under this Division with 3 mm thick black laminated plastic nameplate to indicate equipment controlled to provide instruction or warning. Fasten each plate with two chrome plated screws. Lettering shall be 6 mm high for small devices such as control stations and at least 13 mm high for all other equipment. Submit a list of proposed nameplates for approval before manufacture.

- .2 Provide panelboards with typewritten schedules identifying outlets and equipment controlled by each branch circuit including existing panels being changed. Protect schedules with non-flammable clear plastic.
- .3 Identify junction boxes, pull boxes, cover plates, conduits and the like, provided for future extension, indicating their function (e.g. power, fire alarm, communication).
- .4 Verify room names and numbers prior to listing on nameplates and schedules.

3.8 BRANCH CIRCUIT WIRING & FEEDER CABLES

.1 Provide branch circuit wiring, conduits and feeders as required for Lighting, Power and Auxiliary Systems. Separate conduit systems shall be provided for feeder, lighting and power systems, for exit light system and auxiliary communication systems.

3.9 CONDUIT, RACEWAYS AND WIREWAYS

.1 Wire and cable shall be installed in conduit as follows:

Rigid galvanized steel conduit with threaded IPS fittings to be used:

- 1. Where noted and required by regulations.
- 2. Where subject to mechanical damage.
- 3. For all exposed conduit work.
- .2 Conduit embedded in concrete or buried below grade floors shall be CSA approved rigid PVC type.
- .3 Electrical metallic tubing (EMT) may be used in place of rigid conduit in dry locations subject to governing regulations, embedded in masonry walls, and concealed above suspended ceilings. Connectors shall be provided with factory-installed insulated throats.
- .4 Use flexible metallic conduit for connections to chain suspended and recessed fixture drops, motors and similar equipment to prevent transmission of vibration. A code-gauge green grounding conductor shall be provided for all such connections. Use "Sealtite" conduit with Hubbell-Kellum Sealtite conduit strain relief grips for all such connections at motors.
- .5 Fasten every conduit and cable to structure by means of approved conduit clamps or clips. Wire lashing is not acceptable.
- .6 Conceal conduits and wiring except where noted. Run exposed conduits parallel to building lines and to other conduits. Provide every empty conduit with a pull rope (3 mm polypropylene rope) and identify to designate its function (Power, Telephone, Fire Alarm and the like).
- .7 Where conduit is installed in concrete slabs, obtain general approval, prior to commencing the work, on both maximum dimension and cross-overs which may be used therein.

- .8 Install conduits in such a manner as to conserve head room and interfere as little as possible with free use of space through which they pass. Obtain approval for routing of same. Keep conduits at least 150 mm clear high temperature work.
- .9 Conduits installed at the roof level of exposed structures, shall be run tight to roof deck, above purlins and beams.
- .10 Conduit and cables for electrical work in demountable type and drywall type partitions shall enter from above, from a junction box concealed in the ceiling above and shall comprise a flexible conduit connection.
- .11 All branch wiring shall be provided with a separate code gauge supplementary grounding conductor run in each conduit or duct, terminating at ground block at panelboards.
- .12 Run conduit exposed in mechanical equipment rooms, electrical rooms, fan rooms, and the like, and installed after mechanical and other equipment is completed. Install fixtures, outlets, starters, etc., to clear and to suit application.
- .13 Wiring, boxes, conduit fittings, etc., in hazardous areas shall conform to the Ontario Electrical Code, covering explosion-proof areas. Provide conduit seals where required by these regulations.
- .14 Provide housekeeping curbs around exposed conduits feeding panels, disconnect switches, starters, etc. penetrating floors in front of walls.

3.10 WIRE & CABLE

- .1 Wire and cable shall not be installed at temperatures below 20°C unless "minus 40" type is used. Wiring to heating equipment shall be rated 90°C minimum, the ampacity of which shall be limited to 75°C value.
- .2 Conductors used for all auxiliary systems (e.g. Fire Alarm) shall be tagged and/or colour-coded, and where applicable shall agree with manufacturer's wiring diagrams.
- .3 Minimum wire size for power wiring shall be No. 12 AWG gauge unless specified otherwise. Minimum wire size for "Common" neutral conductors shall be No. 10 AWG. Control wiring shall be #14 AWG red insulation. Maximum voltage drop between furthest outlet of any circuit, when fully energized, and panel to which it is connected shall not exceed two percent except for electric heating circuits which shall not exceed one percent.
- .4 Cables shall be terminated with moisture-proof connectors, clamped to sheet metal enclosure by a single non-ferrous locknut and grounding bushing.
- .5 Sheaths of multi-conductor cables shall be grounded at both cable ends.
- .6 Sheaths of single conductor cables shall be grounded at supply end only. Provide a Code Gauge Grounding Conductor with each feeder cable run.

- .7 Numbers of wires indicated for lighting and power, motor and motor control, alarm, signal, communications, and auxiliary systems is intended to show general scheme only. The required number and types of wires shall be installed in accordance with equipment manufacturer's diagrams and requirements, and with requirements of the installation, except that specification standards shall not be reduced.
- .8 Solderless connectors with nylon-jacketed "Vibration-proof" screw-on wire connectors ideal "Wing Nuts", rated 600 volts shall be used for joints in Branch Wiring.
- .9 Use compression joints and terminals for all control wiring; and all conductors #4 AWG and larger. Mechanical connections are acceptable at panelboards and circuit breakers where these are part of factory-assembly.
- .10 Wire or cables in feeders, sub-feeders and branch circuits shall be colour-coded in accordance with Ontario Electrical Safety Code. Each end of feeder terminations (e.g. in Switchboard, Panelboards, switches, splitters and the like) Code Phase A Red, Phase B Black, Phase C Blue, Neutral White.
- .11 Use C.G.E. Vulcan X-Link insulated cables for circuits protected by ground fault circuit interrupters.
- .12 Include in each conduit, tubing and raceway, a code gauge green supplementary grounding conductor which shall be connected to suitable ground bus in equipment.
- .13 Armoured or sheathed cables may be used only for wiring within demountable and dry wall type partitions and if additionally specified or detailed; however it shall not be directly buried in or below concrete slabs. Once out of the wall, the run shall not exceed 5'-0". All wiring after transition shall be run in conduits c/w junction boxes. No exposed run of BX cables in finished or unfinished areas will be acceptable.

3.11 OUTLET, JUNCTION, & PULL BOXES

- .1 Use suitable electrical boxes for terminations and junctions on conduit work. Install pull boxes where necessary to permit installation of conductors. Support pull boxes, outlet boxes, panels and other cabinets independently of conduit.
- .2 Provide each light switch, wall receptacle and other device with an outlet box of suitable dimensions and a faceplate. Outlet boxes shall be adapted to their respective locations.
- .3 "Thruwall" and "Utility" type boxes shall not be used.
- .4 Electrical boxes and panels shall be CSA approved, code-gauge sheet metal, galvanized or with suitable protective treatment. Secure covers with screws or bolts.
- .5 Outlet boxes shall not be installed "Back-to-Back" in walls; separate by a minimum of 150 mm.

- .6 Use "Masonry Type" outlet boxes for flush installation in masonry walls as detailed on standard Detail Drawings attached hereto. Standard sectional boxes, 1004, 1104 and the like, shall not be used.
- .7 Install surface mounted devices, in cast conduit fittings, with threaded hubs and suitable stainless steel faceplates.
- .8 Main pull and junction boxes (excluding obvious outlet boxes) shall be clearly identified by painting the outside of the cover in accordance with the following schedule:

•	Lighting	Yellow
•	Power	Blue
٠	Fire Alarms	Red
•	Telephone	Cream
•	Control	Brown

- Intercom & Sound Green
- .9 In addition, each box shall be identified with a system and service designator of logic reference to the service.

3.12 ACCESS DOORS & ACCESS MARKERS

- .1 Supply access doors for installation under the work of other Division where electrical equipment requiring maintenance or adjustment or inspection is located above ceilings, within walls or behind furring; except ceilings of lay-in removable panel type.
- .2 Access doors shall be 12 gauge hinged metal Stelpro Ltd. or equal #722 flush type, minimum size 300 mm x 300 mm (12" x 12") "Reach-in" 300 mm x 600 mm (12" x 24") "Crawl-in", with prime coat finish, concealed hinges, screwdriver lock and plaster key. Access doors in finished masonry or drywall construction shall be #722 less plaster key. Access doors shall be #726 in acoustic tile ceilings; #704 in drywall ceiling and #726E in plaster ceilings.
- .3 Access doors in fire rated ceiling assemblies, all fire rated walls, duct shaft or in corridor walls shall be UL, ULC or WHI listed 1-1/2 hour fire rated access doors equal to LeHage #L1010 or Acudor #150B with screwdriver lock.
- .4 Where lay-in removable panel ceilings requiring hold-down clips are used, access doors are not required but panels shall be secured with accessible hold-down clips and marked with Buildemup #6 RH brass paper fasteners inserted through acoustic panel and bent over. Paint heads with blue enamel before installation.
- .5 Obtain approval for sizes and locations.

3.13 ELECTRIC WORK FOR OTHER DIVISIONS

.1 Examine Architectural and Mechanical (Plumbing, Heating, Ventilating and Air Conditioning) plans and specifications to determine extent of electrical work in connection with these Divisions which is to be done under the work of the Electrical Division.

- .2 In general, all loose motor starters and associated controls for mechanical equipment will be supplied under Division 16 for installation and connection to both source and load side of the equipment.
- .3 Co-ordinate the exact location and verify characteristics of electrical provisions for the work of the Mechanical Division.
- .4 Coordinate locations of starters, motors and associated equipment with the work of the Division 15 Mechanical Trade Sections to ensure proper location of equipment. The exact locations of conduit terminations at Mechanical units shall be determined from equipment manufactures' approved shop drawings. Conduits must be installed to enter only in the locations designated by equipment manufactures.
- .5 Provide safety switches required for disconnection of remotely controlled motors, and where required at motors by C.E.C. regulations whether shown on the drawings or not. Where required at fan motors, they shall be concealed in the fan housing if possible.
- .6 Provide for the 120 volt mechanical equipment where noted, all necessary wiring and connections including wiring and installation of starters, thermostats, aquastats, speed controllers and time switches controlling equipment.
- .7 Where motor starters, switches and the like, are grouped together, a suitable 19 mm (3/4") thick plywood panelboard shall be provided to which all such equipment shall be secured. Provide all necessary angle iron supports for support of panelboard and paint entire assembly with two coats of fire retardant type enamel acceptable to Building Inspection Department.
- .8 Provide weatherproof un-fused safety disconnect switches, fastened to exterior of roof mounted units, to approval.
- .9 Connect high temperature thermostats "Firestats" provided in ductwork by Division 15, to exhaust fan systems, to provide fan shutdown on activation.

3.14 GROUNDING – GENERAL

- .1 Ground all electrical systems in accordance with provisions of the Ontario Electrical Code.
- .2 Provide a grounding electrode in accordance with Section 10 of the Canadian Electrical Code.
- .3 Install grounding conductors to permit the shortest and most direct path from equipment to ground. Install grounding conductors in rigid galvanized conduit with both conductor and conduit bonded at both ends. Provide bonding jumpers with approved clamps to maintain ground continuity of metallic raceway systems at all expansion joints.
- .4 Ground connections to grounding conductors shall be accessible for inspection and made with approved solderless connectors bolted to the equipment of structure to be grounded. Clean contact surface prior to making connections to ensure proper metal to metal contact.

Connections shall be of the type that grounds both conduit and conductor, and cap screws, bolts, nuts and washers shall be silicon bronze.

3.15 FIREPROOFING & SEALING

- .1 Make watertight seal at sleeves and other openings through floors above grade. Sleeves to extend minimum 25 mm (1 inch) above finished floors.
- .2 Provide Fireproofing protection of openings through floors and fire rated walls. Refer to Architectural Drawings for rated surfaces.
- .3 Caulk spaces between conduit, cables, bus ducts, raceways, and cable trays with "Cerafibre" 2300 F packing to Building Department approval. Pack and seal both sides of openings with Electrovert "Flameseal" putty, minimum thickness 25 mm (1"). Install in accordance with Electrovert Instruction Bulletin #3601.

END OF SECTION

Tender No. Roof Replacement March 2021

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End of Section 00 01 15



1. GENERAL

- 1. General Requirements shall apply to every section of these specifications and in accordance with Contract Documents.
- 2. *Contractor* shall be *Prime Contractor* and shall be totally responsible for completion of entire Work.

2. Site Examination

- 1. *Contractors* shall visit premises and be satisfied as to conditions affecting Work before submitting a Bid. Misinterpretation of any requirements of these Contract Documents shall not relieve *Contractor* of any responsibility.
- 2. *Contractor* shall obtain approval from Halton District School Board prior to visiting and examining site. Examine site and ascertain extent, nature and any conditions affecting performance of the Work.
- 3. Under no circumstances will any claims against Halton District School Board be allowed resulting from failure to ascertain extent of such Work herein described or implied or for rise in material and labour costs.

3. Review of the Work

- 1. **Alspex Building Consultants Inc.** (Alspex) hereafter referred to, as *Consultant*, will review Work of this Contract, on behalf of Halton District School Board. Co-operate with and provide access to the Work, Site and Samples to *Consultant*.
- Provide Consultant with date each phase of Work will begin, 48 hours before commencing Work. Contractor shall advice Consultant on a daily basis (no later than 7:00 a.m. of Work Day) of daily work schedule. Contact Consultant either by phone, fax or e-mail.
- Cost for tests and site review required by *Consultant* on corrected Work, when initial tests and site review reveal Work <u>not</u> in accordance with Contract Documents, <u>will</u> <u>be deducted</u> by Halton District School Board from moneys due to *Contractor*.
- 4. Re-inspection fees shall be borne by *Contractor* for each initial failed site review and all subsequent site reviews thereafter.

4. Insurance

1. *Contractor* shall provide Halton District School Board with required insurance as per Bid Documents.

5. Notice of Project

1. Contractors (Constructors) are required to notify Ministry of Labour before construction begins of any project meeting Section 6 of the Regulation for Construction Projects (O. Reg. 213/91)



2. Contractor shall advise and submit to Ministry of Labour a "Notice of Project" for any project valued over \$50,000.00. Proof of Notice of Project shall be submitted to Halton District School Board and a copy must be posted at site. Location to be confirmed by Halton District School Board.

6. Constructor

1. *Contractor* shall be required to clearly identify their work area on site with barriers and signage to avoid '*Owner*' being noted as "Constructor". *Owner shall not* be deemed 'constructor' under any circumstance. *Contractor* shall be responsible to control 'work site' at all times.

7. Indemnification

1. *Contractor* shall defend, indemnify and hold Halton District School Board *and Consultant* harmless from all claims, actions, demands, loss and causes of action arising from injury, including death, to any person, or damage to any property, arising out of or related to activities of *Contractor*, its officers, subcontractors, agents and employees under this contract.

8. **Proprietary Information**

1. *Contractor* shall keep confidential all information, drawings, specifications, data, intellectual property, or knowledge furnished by Halton District School Board or *Consultant* or prepared by *Contractor,* in conjunction with this Contract.

9. Limitation on Assignment

1. *Contractor* shall not assign, sell, transfer or subcontract rights, or delegate responsibilities under this Contract, in whole or in part, without the prior written approval of Halton District School Board.

10. Payment Certifier

- 1. *Consultant* is 'Payment Certifier' upon whose certificates of payments are made under contract and certifies Substantial Performance.
- 2. *Contractor* is required to submit <u>in writing</u>, a request for final inspection to *Consultant* in order for *Consultant* to Certify Substantial Performance.

11. Reference Standards

1. Reference standards, to manufacturer's and published codes, standards and specifications are to the latest edition, (revision) approved by issuing organization, current at date of this Specification.

12. Project Meetings

1. Attend project meetings as requested by Halton District School Board or *Consultant*. Project meetings will be held bi-weekly if requested by *Consultant*. *Contractor's* superintendent shall attend along with all requested subcontractors.



13. Codes, By-Laws and Standards

- 1. Execute Work to comply with, meet or exceed the following:
 - 1. Ontario Building Code, including all amendments up to project date.
 - 2. Ontario Fire Code, including all amendments up to project date.
 - 3. Occupational Health and Safety Act and regulations for Construction projects
 - 4. Canadian Construction Safety Code
 - 5. Rules and regulations or authorities having jurisdiction.
 - 6. Project Contract Documents.
 - 7. Latest edition of all relevant codes, by-laws, regulations and standards.
- 2. Where Drawings and Specifications exceed Code or Jurisdictional requirements, **more stringent requirements shall govern**.
- 3. Adhere to most stringent requirement when above noted codes and standards conflict.
- 4. Review with Halton District School Board and *Consultant* situations, which are ambiguous, before proceeding with Work.

14. Drawings and Specifications

- 1. Work in Specification is divided into descriptive Sections that are not intended to identify absolute contractual limits. Where drawings do not show all structural and architectural details and accurate dimensions are required, these shall be obtained by measurements at the site.
- 2. *Contractor* shall be responsible for organizing labour and supply of materials essential to complete Work in all its parts and provide protection of Work, public and property.
- 3. Drawings and specifications complement each other and neither is to be considered independent. Therefore, any item omitted in one, but mentioned, indicated or implied in the other, shall be provided. **More stringent requirements shall govern.**
- 4. All changes to Contract Documents which result in an extra or credit to Contract amount, are not to be executed until written instructions have been received and the extra or credit agreed to in writing by all parties to the Contract.
- 5. *Contractor* shall execute variations, alterations, modifications and substitutions that do not affect Contract amount as instructed by *Consultant* or Halton District School Board.



15. Additional Instructions and Drawings

- 1. *Consultant* may furnish additional instructions and drawings to assist with proper execution of Work. These instructions and drawings will be issued for clarification only. Such instructions and drawings shall have same meaning and intent as if they were included with Contract Documents.
- 2. Issuance of additional instructions or drawings is not intended to result in a change to Contract Price or Contract Time.
- 3. Do not proceed with any Work that will result in a change to Contract Price or Contract Time without Halton District School Board and *Consultant's* approval by way of a signed Change Order or Change Directive.

16. Approved Alternatives

- Requests for Approved Alternatives shall be submitted <u>by Contractor</u> in writing seven (7) calendar days prior to Bid Closing for Owner's and Consultant's review. Approval (in writing) on Alternatives shall be obtained from Consultant and an addendum shall be provided for all Bidders.
- 2. Bidder shall include following information: manufacturer's name and supplier's name; change in price; reason for proposing alternate; detailed description of alternate; statement assuming full responsibility of any additional costs/equipment, R-Values and weight/loading calculations, etc.
- 3. Owner and Consultant reserve right and shall have sole authority and discretion to accept or reject 'Approved Alternatives' and to adjust or reject Bids as required. Rejection by Consultant does not require Consultant to become obligated to give any reason for their decision and action.
- 4. Approval of any Alternates shall not affect specified warranty requirements.

17. Errors or Omissions During Work

- 1. Contractor shall notify Owner and Consultant immediately of any error or unusual condition which may be found. Any attempt by Contractor to make changes because of error or unusual condition shall be done at Contractor's expense.
- 2. Any additional cost incurred by *Contractor* to remedy a wrong decision shall be borne by *Contractor. Consultant* shall make final decision for any necessary alterations as a result of error or unusual condition.

18. Subcontracting

- 1. Subcontracting of any portions of the work outlined in these specifications will not be permitted without prior written consent of *Consultant* and Halton District School Board <u>unless</u> identified in Bid Form.
- 2. Any work undertaken by subcontractors shall in no way relieve *Contractor* of theirs and any responsibilities.


19. Scheduling

- 1. Scheduling of the Work shall be discussed with, and be subject to approval of Halton District School Board and *Consultant*. Coordinate all schedules with Halton District School Board and *Consultant* to suit occupant requirements.
- 2. Submit to *Consultant* and Halton District School Board initial schedule within seven (7) working days after Contract award and prior to commencing Work, showing anticipated progress stages and final completion of Work.
- 3. *Contractor* shall provide Halton District School Board with a complete plan or layout of their work schedule prior to commencing any work. All work scheduled shall be approved by *Consultant* and Halton District School Board.
- 4. Access to building and site shall be pre-arranged based on approved schedule. Adhere to schedule as stringently as possible and notify Halton District School Board and *Consultant* of all changes to schedule such that pre-arranged access is provided.
- 5. *Contractor* shall take all possible steps to minimize interference with building operations and schedule their work, etc., in such a manner as to accomplish this.
- 6. Do not carry out any Work without first informing *Consultant* by way of approved schedule or by special notice. Notify Halton District School Board and *Consultant* of all changes to approved schedule.
- 7. Interim review of work progress based on work schedule will be conducted as decided by *Consultant* and schedule updated by *Contractor* in conjunction with and to approval of *Consultant*.
- 8. It is *Contractor's* responsibility to ensure that once a project has started, that there are no unreasonable delays in completion and **work is carried out continuously and in an expeditious manner** in accordance with specified schedule.
- 9. Schedule shall comply with Section 01 11 00 Summary of Work.

20. Execution of Work

- 1. Pre-arrange access to buildings and site with Halton District School Board and *Consultant*. Normal building operations will continue while Work of this Contract is being performed. Adhere to pre-approved schedule as stringently as possible.
- 2. Execute Work with least possible interference or disturbance to occupants, public and normal use of premises, roadways, parking areas, sidewalks, alleys, or passageways. Do not block fire exits.
- 3. Perform Work that interferes with building occupants comfort at times specified by Halton District School Board.
- 4. Coordinate with Halton District School Board shut down of air handling units located in vicinity of re-roofing operations which produce fumes (i.e., hot asphalt applications,



kettle operation, adhesives, etc.). Confirm that air handling equipment is shut down prior to commencing operations, which produce fumes.

- 5. Take proper care to avoid unnecessary noise. Advise Halton District School Board, *Consultant* and occupants ahead of time and make suitable arrangements when excessive noise or obstruction is unavoidable.
- 6. Provide temporary means to maintain security, where security is reduced by Work in Contract. Provide suitable protection to all interior and exterior building surfaces, landscaping and vehicles from debris and damage for duration of Contract.
- 7. Take all necessary precautions to keep dust, dirt and noise to an acceptable level by means of protection or revised operations as directed by *Consultant* and Halton District School Board.
- 8. Perform a preconstruction inspection with *Consultant* of all work areas and work access areas to record condition of existing building and site components, which are to remain. Notify *Consultant* in writing of any existing damage caused by others.
- 9. Make good, to satisfaction of Halton District School Board and *Consultant*, any damage resulting from Work of this Contract.
- 10. Provide and arrange for traffic control where necessary for delivery of materials, removal of garbage, etc. as required by laws, ordinances, rules and regulations relating to the Work.

21. Permits and Inspection

- 1. *Contractor* shall obtain all permits, licenses, notices and certificates of inspection and approval required to carry out work and provide proof of same to *Owner* and *Consultant.* **Owner** shall pay for any required Building Permits.
- 2. *Contractor* shall at completion of project, present to *Owner*, unconditional acceptance of installation of all authorities having jurisdiction. Furnish certificates, inspection reports and permits when requested.
- 3. Provide authorities having jurisdiction with information requested. Contractor shall provide safe access for required inspections. Furnish certificates, inspection reports and permits when requested.
- 4. In cases where applicable jurisdiction (City/Municipality) does not require building permits and/or licenses to carry out the work specified in the Bid Documents, *Contractor* is to provide *Consultant* with written confirmation that jurisdiction does not require permits/licenses to complete the Contract in its entirety.
- 5. *Contractor* shall at completion of project, present to *Owner*, unconditional acceptance of installation of all authorities having jurisdiction. Furnish certificates, inspection reports and permits when requested.



22. Inspection and Testing

1. <u>Contractor shall be responsible for all inspection and testing</u> as required by Contract Documents, laws, ordinances or regulations or any other jurisdictional authority.

23. Health and Safety Requirements

- 1. Provide all safety requirements and protection necessary or as required by local bylaws, governing authorities, Halton District School Board and *Consultant* including but not limited to: guard rails, barriers, night lights, sidewalk and curb protection, warning notices and covered or hoarded doorway protection.
- 2. Take all precautions and provide all required protection to ensure safety of general public and Workers in accordance with the latest edition of the Occupational Health and Safety Act and Regulations for Construction Projects.
- 3. *Contractor* shall ensure only competent personnel are permitted to work on site.
- 4. Provide an adequate supply of required protective clothing and equipment to workers, such as eye goggles, hard hats, and gloves in accordance with Ontario Health and Safety Association regulations.
- 5. **Owner** or **Consultant** will remove from site any persons not observing or complying with safety requirements. Continued disregard for safety standards can cause Contract to be cancelled and *Successful Bidder* and *Subcontractors* removed from Site.
- 6. *Contractor* shall report to *Owner*, *Consultant* and authorities having jurisdiction any accident or incident involving *Successful Bidder*, *Owner*, *Consultant* or public personnel and property arising from execution of the Work.
- 7. Provide portable fence, minimum 2440 mm (8 ft.) high, around all ground stations. Maintain lockable containers on site, if approved by *Owner*.

24. Damages

1. *Contractor* shall be responsible for all and any damages to building and contents caused by their forces for whatever cause or reason and shall indemnify and save *Owner* harmless from injury to public when working within and around buildings.

25. Contractor's Use of Site

- 1. Access to buildings, site, on-site parking and use of washrooms will be as specified by Halton District School Board. *Contractor* shall access roof areas from exterior.
- 2. Do not unreasonably encumber site with materials or equipment. Move stored materials or equipment, which interfere with operations of Halton District School Board or other Contractors.



- 3. Do not store materials or use trucks, cranes, hoists, or other equipment in a manner, which would load building structure and other adjacent structures beyond their design capacity.
- 4. Obtain and pay for use of additional storage needed for operations. Do not transport materials through the buildings.

26. Portable Facilities

1. *Contractor* shall provide their own portable toilet/facilities. The portable toilet shall be adequately secured to *Contractor's* equipment to prevent toppling over or other means of vandalism. Location to be approved by Halton District School Board.

27. Water Supply

1. If water supply is available, it may be provided for construction use at no cost to *Contractor at* Halton District School Board discretion.

28. Power

- 1. *Contractor* shall provide temporary, gas powered generator in accordance with governing regulations and ordinances, for all required Work.
- 2. Minimal electrical power supply is available by Halton District School Board and may be provided for construction use at cost to *Contractor*.

29. Cutting, Fitting and Patching

- 1. Execute cutting, fitting and patching required to make Work fit properly.
- 2. Where new work connects with existing and where existing work is altered, or cut, patch and make good to match existing work.
- 3. Obtain *Consultant's* approval before cutting, boring or sleeving load-bearing members.
- 4. Make cuts with clean, true, smooth edges. Make patches inconspicuous in final assembly. Fit work airtight to pipes, sleeves, ducts and conduits.

30. Existing Services

- 1. Where work involves breaking into or connecting to existing services, carry out work at times directed by governing authorities, with minimum of disturbance to pedestrian and vehicular traffic.
- 2. Before commencing Work, establish location and extent of service lines in area of work and notify *Consultant* of findings.



- 3. Submit schedule to and obtain approval from *Consultant* and Halton District School Board for any shut-down or closure of active service or facility. Adhere to approved schedule and provide notice to affected parties.
- 4. Where unknown services are encountered, immediately advise *Consultant* and confirm findings in writing. Record locations of maintained, re-routed and abandoned service lines.

31. Fire Prevention

- 1. Keep project site free of waste materials, rubbish and debris. Follow fire prevention measures established by Halton District School Board.
- 2. Do not bring to site, use or dispose of at site any flammable liquids having a flashpoint lower than 43°C (except when in use as fuel in operating equipment) without permission of the *Consultant*.
- 3. All such flammable liquids shall be confined either in safety containers approved by Underwriter's Laboratories of Canada, or in the fuel tanks of the operating equipment.
- 4. No burning or welding operations shall be performed without permission of the *Consultant*. Provide 10kg (20 lb.) dry chemical fire extinguisher fully charged and in operable condition at every location where open flames are used.
- 5. If 'hot work' i.e. torching, welding, is to be carried out, a permit shall be obtained, signed and copy provided to Halton District School Board.

32. Documents Required

- 1. Maintain at Work Site, one copy of the following:
 - 1. Contract Documents
 - 2. Addenda
 - 3. Change orders
 - 4. Other modifications to Contract
 - 5. Notice of Project
 - 6. MSDS Sheets for Hazardous Materials
 - 7. Copy of approved work schedule.

33. Setting Out Work

- 1. Assume full responsibility for and execute complete layout of Work to locations, lines and elevations indicated.
- 2. Provide devices needed to lay out and construct Work in accordance with Contract Documents. Provide such devices as straight edges and templates required to facilitate *Consultant's* inspection of Work.



34. Materials

- 1. When materials and equipment is specified by standard or performance specifications, upon request by *Consultant*, obtain from manufacturer and submit to *Consultant*, an independent testing laboratory report stating that material or equipment meets or exceeds specification requirements.
- 2. Particular method, material, procedure or equipment specified shall be used as a standard.
- 3. During and upon completion of Work, *Contractor* shall remove from premises all surplus materials, equipment and debris.

35. Construction Equipment

- 1. Provide and maintain all construction equipment necessary to perform specified Work expeditiously.
- 2. Provide and maintain all required hoisting equipment for movement of materials and equipment and for removal of debris during construction.
- 3. Provide and maintain temporary ladders required to perform the Work. Ladders shall be strongly constructed and shall comply with all requirements of safety authorities having jurisdiction over the Work. All ladders shall be secured and used only by methods approved by Authorities.
- 4. Provide and maintain all required suspended platforms to perform the Work. Suspended platforms shall meet requirements of CAN3-Z271-M, Safety Code for Suspended Powered Platforms, Local By-Laws and requirements of governing authorities.
- 5. Provide and maintain all required scaffolding necessary to perform the Work. Erect scaffolding independent of walls. Construct, maintain and use scaffolding in accordance with CAN/CSA-S269.2-M, Access Scaffolding for Construction Purposes.

36. Delivery, Storage and Handling

- 1. Deliver, store and maintain packaged material unopened with manufacturer's seals and labels intact. Prevent damage, adulteration and soiling of material and equipment during delivery, handling and storage. Immediately remove rejected material and equipment from site.
- 2. Store material and equipment in accordance with supplier's instructions and to *Consultant's* approval. No materials or equipment are to be stored within building unless approved by Halton District School Board. **Protect all materials from freezing and moisture.**
- 3. *Contractor* shall be responsible for handling, delivery and storage of materials. Halton District School Board employees shall not be allowed to assist in any loading or unloading.



37. Site Supervision

- 1. *Contractor's* foreman/superintendent shall sign in and out daily at front desk. Contractor shall provide the number of workers on site, the locations of the day's work area. *Contractor* shall provide two days advance notice of work areas.
- 2. Provide at Project Site at all times, during construction hours, a competent Supervisor, who shall be empowered to act on behalf of *Contractor* in execution of this Contract. This person shall be named and approved by *Consultant* and Halton District School Board prior to starting Work and must have a mobile telephone.
- 3. Always provide a competent person on duty for emergency calls after regular construction hours and on weekends. This person shall be named and approved by *Consultant* and Halton District School Board prior to starting Work and must have a mobile telephone.
- 4. Supply *Consultant* and Halton District School Board with name(s) and mobile telephone number of approved persons to be contacted during these periods.

38. Quality Assurance and Workmanship

- 1. All Work shall only be done by a recognized and approved *Contractor* having minimum five (5) years of proven, satisfactory and related experience with skilled workmen thoroughly trained and competent in carrying out required work.
- 2. *Contractor* is responsible for quality control of his own work and his subcontractors.
- 3. Contractor shall designate a qualified superintendent and foreman for this Project. Appointed superintendent/foreman must remain on project for its duration and must attend all site meetings. Substitution of these individuals will not be permitted without prior approval of *Consultant or* Halton District School Board.
- 4. Any Work not acceptable to Halton District School Board, *Consultant or Local Authorities* having jurisdiction, shall be removed and replaced by *Contractor* when and as directed by them. The cost of such work shall be sole responsibility of *Contractor* and shall be done to satisfaction of Halton District School Board and *Consultant*.
- 5. If *Consultant* or Halton District School Board deem it not expedient to correct defective work or work not done in accordance with Contract Documents, Halton District School Board may deduct from Contract Price, difference in value between work 'as done' and that called for by Contract, amount of which shall be determined by *Consultant*.

39. Emergency Vehicle Liability

- 1. *Contractor* shall be responsible for any false alarms causing dispatch of any and all emergency vehicles.
- 2. *Contractor* shall pay for any and all costs associated with false alarms.



40. Asbestos Containing Material (ACM's)

- 1. No materials or equipment containing any form of asbestos or lead shall be permitted on Project.
- 2. Prior to any work being done, *Contractor* shall review Asbestos Management Program Manual and determine whether ACM's will be disturbed by *Contractor's* work.
- 3. If *Contractor* determines that ACM's will be disturbed, *Contractor* shall notify *Consultant* and Halton District School Board of their findings. Halton District School Board shall arrange for appropriate remedial action prior to commencement of *Contractor's* work.
- 4. If *Contractor* encounters "unexpected" ACM's, he/she shall temporarily cease such work at once, immediately inform *Consultant* and Halton District School Board.

41. Designated Substances

1. If a designated substance is located during work, stop work and notify Halton District School Board or *Consultant* immediately. Halton District School Board will arrange for abatement of Designated Substances in accordance with appropriate current legislation under Occupational Health & Safety Act.

Item No.	Designated Substance	Probable Location
1.	Asbestos	pipe insulation; ceiling tiles; floor tiles; plaster; sealants; vent pipes: drain flanges
2.	Lead	piping; solder joints; paint finishes; roof/drain flashings
3.	Silica	concrete and cement products
4.	PCB'S	capacitors; light ballasts, paint and sealants

2. Designated Substance and Probable Locations

42. Material Safety Data Sheets and WHMIS Requirements

- 1. *Contractor* shall ensure that every "controlled product" used at work site shall meet labeling requirements and have an updated corresponding Material Safety Data Sheet as per the Workplace Hazardous Materials Information System legislation (WHMIS).
- 2. *Contractor* shall ensure that all material safety data sheets (MSDS) are available at Site.



43. Contract Schedule and Working Days

- 1. Bidder, upon award of Contract, shall commence work as stipulated in Contract Documents and proceed expeditiously and uninterrupted to project completion.
- 2. *Consultan*t shall be solely responsible for determining 'Work Day' as defined in Contract Documents.

44. Site Reviews

- 1. Contractor shall give Consultant timely notice for site reviews of critical installations, as requested by Consultant. Halton District School Board will pay costs for site reviews that are acceptable. However, any initial site reviews and additional reviews due to non-conformance to Contract Documents shall be at Contractor's expense and will be deducted from Contract amount.
- 2. *Consultant* will promptly conduct site reviews. Work covered up prior to site review or without *Consultant*'s approval, shall be uncovered for examination and made good at *Contractor's* expense. Reviews may be performed at place of manufacture, fabrication, storage or site.
- 3. *Contractor* shall ensure that proper facilities, assistance and access is provided to execute required reviews to *Consultant's* satisfaction.

45. Daily and Final Cleaning

- 1. Remove temporary protection. Remove dust, dirt and foreign matter from interior and exterior surfaces on a daily basis or more frequently if requested by *Owner*.
- 2. Broom clean paved exterior surfaces, rake clean exterior surfaces on a daily basis.
- In preparation for Substantial Performance or occupancy for each phase of construction, conduct inspection of sight-exposed interior and exterior surfaces and concealed spaces.
- 4. Employ experienced workers for final cleaning. Use only cleaning materials recommended by manufacturer of surface to be cleaned.
- 5. Repair, patch and touch-up marred surfaces to match adjacent surfaces. Final cleaning and repairs shall be acceptable to *Owner*.

46. As-Built / Record Drawings

- 1. After award of Contract, *Consultant* will provide *Contractor* with a hardcopy and digital copy of drawings.
- 2. *Contractor* shall maintain, as work progresses, records of significant changes, revisions, additions and deletions to or from Contract Documents, including location, depth/size and type of existing/abandoned utilities and services.



- 3. Neatly mark on hardcopy, locations of structures, services and similar work not clearly in view, position of which is required for maintenance, alteration work, and future additions. Do not conceal critical work until its location has been recorded.
- 4. Make arrangements to enter as-built information from marked-up record drawings to digital format of AutoCAD 2010 or newer version, on CD-Rom. As-built information to be entered on layers to Halton District School Board standard.
- 5. Submit marked-up hardcopy and up-dated digital drawing file for *Consultant's* review on application for Certificate of Substantial Performance.

47. Project Commissioning

- 1. Collect, assemble and submit to *Consultant* documents executed by subcontractors, suppliers and manufacturers.
- 2. *Contractor* shall submit documentation stating all equipment and services modified during this project have been adequately re-installed, are operational and functioning as required.

48. Operating and Maintenance Instructions

- 1. Instruct *Owner's* representatives in proper operation and maintenance of equipment. Provide 3 (three) copies of Maintenance Manuals and Operating Instructions. Manuals to be delivered to *Owner's* Representative at Contract Close-Out.
- 2. Data shall be assembled in systematic order, generally following the specification format, in three ring binders. Provide covered tabs fastened to hard paper dividers to identify different sections.

49. Waste and Disposal

- Waste Management Disposal Company shall be approved and licensed by Ministry of Environment for transportation and disposal of all site and construction related materials. Transportation and disposal of all materials shall meet Ministry of Environment guidelines.
- 2. Maintain work area and site free of accumulated waste and rubbish. Dispose of debris and garbage on a daily basis with minimum disturbance to Halton District School Board. Remove full garbage bins daily. <u>Do not pile debris or garbage at Site.</u>
- 3. Provide garbage bins and enclosed chutes required for daily disposal of debris and garbage. Obtain approval from Halton District School Board for bin location prior to commencement of Work.
- 4. *Contractor* may be required to submit copies of all Bills of Lading from disposal facilities and transfer stations to *Consultant*.



50. Contract Close-Out

- 1. Upon completion of the Work and before Final Payment Certificate, following required documents shall be submitted and be acceptable to *Consultant*:
 - 1. Statutory Declaration
 - 2. Workplace Safety Insurance Board Certificate of Clearance
 - 3. Publication of Substantial Performance
 - 4. Record Drawings
 - 5. Certificates of Warranties
 - 6. Manuals



1. GENERAL

1.1 Section Includes

1. Submittal of shop drawings, product data, samples and mock-ups.

1.2 Shop Drawings

- 1. *Contractor* shall provide Shop Drawings as required in Contract Documents. *Consultants*' drawings are not to be used as 'Shop Drawings'.
- 2. Consultant's review is for conformity to design concept and for general arrangement only.
- 3. Term "shop drawings" mean drawings, diagrams, illustrations, schedules, performance charts, brochures and other data, which are to be provided by *Contractor* to illustrate details of a portion of the Work.
- 4. 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 the Work.
- 5. *Contractor* shall provide Shop Drawings to *Consultant for* review in an orderly sequence and sufficiently in advance so as to cause no delay in the Work or in the work of other contractors.
- 6. *Contractor* shall provide Shop Drawings in 280 mm x 432 mm (11 in. x 17 in.) in PDF format, forwarded by e-mail.
- 7. Shop Drawings shall indicate by stamp, date and signature of person responsible for review that *Contractor* has reviewed each one of them. *Contractor* shall expressly advise *Consultant* in writing of any deviations in a Shop Drawing from requirements of Contract Documents.
- 8. Shop Drawings which require approval of any legally constituted authority having jurisdiction shall be provided to such authority by *Contractor* for approval.
- 9. *Contractor* shall review all Shop Drawings before providing them to the Consultant. The Contractor represents by this review that:
 - Contractor has determined and verified all applicable field measurements, field construction conditions, Product requirements, catalogue numbers and similar data, or will do so, and
 - Contractor has checked and co-ordinated each Shop Drawing with the requirements of the Work and of the Contract Documents
- 10. Consultant's review shall not relieve Contractor of responsibility for errors or omissions in Shop Drawings or for meeting all requirements of Contract Documents.
- 11. Contractor shall provide revised Shop Drawings to correct those which the *Consultant* rejected. *Contractor* shall notify *Consultant* in writing of any revisions to Shop Drawings other than those requested by *Consultant*.



12. Consultant will review and return Shop Drawings in accordance with schedule agreed upon, or, in absence of such schedule, with reasonable promptness so as not to cause delay in the performance of the Work.

1.3 Material Lists

1. *Contractor* shall submit Material List identifying each Material to be used with manufacturers and suppliers' name and method of application <u>prior to commencing</u> <u>Work.</u>

1.4 Construction Schedule

1. Submit required Construction Schedule in accordance with General Conditions or General Instructions.

1.5 Labour and Products

- 1. *Contractor* shall provide and pay for labour, Products, tools, Construction Equipment, water, heat, light, power, transportation, and other facilities and services necessary for performance of the Work in accordance with Contract Documents.
- 2. Unless otherwise specified in Contract Documents, Products provided shall be new, of best quality, in perfect condition, dry, free from defects, which may impair performance, strength, durability or appearance. Products which are not specified shall be of a quality consistent with those specified and their use acceptable to *Consultant*.
- 3. *Contractor* shall maintain good order and discipline among *Contractor*'s employees engaged on the Work and shall not employ anyone not skilled in the tasks assigned.

1.6 Samples and Mock-Ups

- 1. *Contractor* shall provide samples and mock-ups in accordance with Contract Documents for *Owner's* and Consultant's review for: material, colour, installation methods, and integration of adjacent materials and assemblies, to establish acceptable standard.
- 2. Submit samples in duplicate as requested in respective Sections. Identify manufacturer or suppliers name and materials. Deliver samples prepaid to *Consultant's* business address.
- 3. Notify *Consultant* in writing, at time of submission of deviations and reasons, in samples from requirements of Contract Documents. Adjustments requested to samples, by *Consultant*, are not intended to change Contract Price. If adjustments affect the value of Work, state in writing to *Consultant* prior to proceeding with the Work.
- 4. Make changes in samples that *Consultant* may require, consistent with Contract Documents. Products supplied and installed shall match reviewed samples.



TECHNICAL SECTIONS

1. GENERAL

2. Work Includes

- 1. General Conditions, Supplementary Conditions and Contract Documents shall govern the Work.
- 2. *Contractor* shall be responsible for providing all labour, material, equipment and services to complete the Work in accordance with Contract Documents.

3. Place(s) of the Work

1. The Place(s) of the Work is/are.

John T. Tuck Public School 2265 Spruce Ave Burlington, Ontario L7N 1J7

4. Description of Work

- 1. This Contract shall be for removal and replacement of described roof system(s) at the Place of the Work:
- 2. Roof Replacement Areas C, D, Da, D1, E & F

5. Summary of Work

 Summary of Work provided is a general guideline only and is not intended as limiting Scope of Work. Work shall be carried out to full intent of Contract and in accordance with

Contract Documents.

- 2. Drawings and details are diagrammatic and are not intended to convey entire Work. Drawings and details indicate general intent of design and approximate location and arrangement of Work.
- 3. *Contractor* shall be responsible for verifying all elevations, lines, levels, and dimensions shown on drawings and details and reporting any discrepancies to *Consultant* prior to commencing Work, so that all work is carried out and installed in accordance with Contract Documents.

6. Scope Of Work

- 1. Remove and dispose of all existing sheet metal flashings and trim, gravel, bituminous felts, overlay board and wood not required to remain for new systems.
- 2. Provide enclosed disposal chute, tarpaulins and perimeter barriers during removal and disposal of refuse. Dispose of all waste in approved bins and transport to approved Ministry of Environment disposal site(s).
- 3. Existing mechanical and electrical equipment and services must be disconnected and removed from work area, including HVAC Units, electrical conduits and gas lines, to



facilitate new roof system applications and re-installed once all roofing work has been completed with all required modifications. TSSA Documentation shall be provided.

- 4. **All abandoned** skylights, curbs, sleepers and stacks to be removed and provide new deck, vapour retarder and insulation to match roof height.
- 5. Provide new structural steel and metal deck at skylight infill areas as per structural drawing.
- 6. Provide new rough carpentry.
- 7. Provide new roof system comprising of: sheet metal flashing and trim, sealants, modified bituminous membrane and flashings, vent pipe sleeves & exhaust sleeves, drains, overlay board, tapered and base insulation, vapour retarder and all miscellaneous items.
- 8. Provide new gas line/conduit/pipe and duct supports.
- 9. Provide new roof access ladders.
- 10. Provide new rainwater leader at drain from Area Da to D1.
- 11. Provide new overflow scupper(s).
- 12. Provide precast pavers & pedestals.
- 13. Re-instate all mechanical and electrical equipment and services to original working conditions with all required modifications to ductwork and services. Submit certification of services to authorities having jurisdiction.
- 14. Perform daily and final clean-up of work areas and site.

7. Work Days & Hours

- 1. Workdays and hours shall be carried out in accordance with Contract Documents and Halton District School Board requirements and as follows:
 - 1. Monday to Friday 7:00 a.m. to 7:00 p.m.
- 2. Workdays and hours shall not contravene local Noise By-Laws.

8. Progress of Work

- 1. Working Days Allowed:
- 2. Commencement:
- 3. Substantial Performance: August 27, 2021
- 4. Total Completion: <u>40 Days After Substantial Performance</u>

End of Section 01 11 10



1. GENERAL

1.1 Section Includes

- 1. Section includes for provision of all labour, materials, equipment and services for the Selective Structure Demolition and removal of Work in accordance with Contract Documents.
- 2. Section includes for removal and disposal of designated roof areas and components and skylights not required to remain at Place of the Work.

1.2 Related Sections

- 1. Section 01 10 00 General Instructions
- 2. Section 01 11 00 Summary of Work
- 3. Section 06 10 00 Rough Carpentry
- 4. Section 07 51 13 Built-Up Asphalt Roofing
- 5. Section 07 62 00 Sheet Metal Flashing and Trim
- 6. Section 07 92 00 Joint Sealers

1.3 Submittals

- 1. Submit shop drawings, diagrams and details clearly showing selective demolition sequence, if requested by *Consultant*.
- 2. Submit shop drawings stamped by a Professional Engineer, licensed in province of Ontario for work requiring scaffolding and stages or if required by authorities having jurisdiction.

1.4 Operations

- 1. Do not interrupt or delay Halton District School Board operations.
- Perform operations, at times designated by Halton District School Board, that will not adversely affect occupants of building and operations in and around site access and egress.

1.5 Protection

- 1. Provide enclosed chute from roof level to ground disposal bin. Under no circumstances shall material be thrown from the roof.
- 2. Provide perimeter barricades and tarpaulins, guard rails, overhead scaffolding and other necessary protection to ensure safety of occupants, public and site workers.
- 3. Hang tarpaulins where refuse and other materials are lowered.
- 4. Enclose areas used for removal of debris and materials with temporary framing or fencing and post warning signs.



- 5. Temporarily protect interior spaces, where overhead work is proceeding, and provide dustproof and weatherproof partitions.
- 6. Provide perimeter protection including but not limited to: barriers to adjacent buildings, surfaces, equipment and properties by use of guard rails, mesh, screens, tarps, etc., to contain roof debris and prevent damage.
- 7. Provide protection for all roof drainage systems.

1.6 Permits

- 1. If required, arrange and pay for all permits, notices and inspections necessary for the proper execution of selective demolition.
- 2. Carry out demolition Work in accordance with the Ontario Occupational Health and Safety Act and Regulations for construction projects, Construction Safety Act of Ontario, Ontario Building Code and Authorities having jurisdiction.

2. PRODUCTS

2.1 Materials

1. Not Used.

3. EXECUTION

3.1 Selective Structure Demolition

- 1. Material requiring demolition shall be responsibility of *Contractor*. Remove materials from site daily, unless such materials are to be re-used, remain in assembly or are for Halton District School Board use.
- 2. Perform demolition work to prevent damage to materials to remain and to adjacent equipment and surfaces. *Consultant* and Halton District School Board will determine acceptance of materials damaged during demolition and removal.
- 3. Clean up debris and all deleterious material and dispose at end of each workday or place in disposal bins with protective covers.
- 4. Stockpiling of debris and surplus materials on roof will not be permitted.

3.2 Preparation

- 1. Arrange for all mechanical and electrical equipment and services to be disconnected and relocated by licensed professionals.
- 2. Do not disconnect HVAC equipment without the knowledge and approval of the *Consultant* or Halton District School Board and for no more than 48 hours.
- 3. If required, carry out work during weekends or after hours.



3.3 Demolition

- 1. Perform demolition work with extreme care to designated roof areas. Gravel to be vacuumed from roof surface to minimize airborne debris.
- 2. Remove materials of existing systems that can be replaced with new complete specified systems on a daily basis to maintain integrity of roof and wall.
- 3. Only the following materials are to be removed on Areas C, D, Da, E and F: Gravel, membrane and 13 mm (1/2 in.) Overlay Board.

The <u>inter-ply membrane and lower materials are to remain</u> intact and undamaged. Extreme care and due diligence shall be exercised during removal so as not to damage materials to remain.

- 4. Ensure method of roof removal does not damage existing roof deck and structural components and adjacent works that are to remain.
- 5. Clean drains of all debris on a daily basis.
- 6. Do not use hoists, equipment, discarded material or equipment in a manner that may overload structure. Perform Work to minimize dusting. Maintain work areas wetted down to prevent dusting.
- 7. *Contractor* shall inform *Consultant* of any unusual or deteriorated construction components revealed during demolition. *Consultant* shall review questionable conditions prior to new roof applications.
- 8. Leave work in safe condition so that no part is in danger of toppling or falling at end of each day's work. Removal and installation of any roof components during inclement weather is not permitted.

9. Do not use mechanical means to remove existing roof system from: Siporex; Tectum; Rapidex and Lightweight Decks.

3.4 Disposal

- 1. Transportation and disposal of all materials must meet guidelines, be approved and licensed by the Ministry of Environment. Dispose of debris on a continuous basis.
- 2. Cost of transporting to dump site and for dumping of materials, etc., are to be included in Total Bid Price.
- 3. *Contractor* may be required to submit 'Bills of Lading' from disposal facilities to *Consultant* as proof of compliance.

3.5 Restoration

1. Restore all Products, areas, landscaping and equipment etc. damaged during work of this Contract to satisfaction of *Consultant* and Halton District School Board.

End Of Section 02 41 19



1. GENERAL

1.1 Section Includes

1. Section includes for provision of all labour, materials, equipment and services for new rough carpentry in accordance with Contract Documents.

1.2 Related Sections

- 1. Section 01 10 00 General Instructions
- 2. Section 01 11 00 Summary of Work
- 3. Section 21 41 19 Selective Structure Demolition
- 4. Section 07 51 13 Built-Up Asphalt Roofing
- 5. Section 07 62 00 Sheet Metal Flashing and Trim
- 6. Section 07 92 00 Joint Sealers

1.3 References

- 1. CSA B1111 Wire Nails, Spikes and Staples
- 2. ANSI B18.6.1 Slotted and Recessed Wood Screws
- 3. CSA O121 Douglas Fir Plywood
- 4. CSA O151 Canadian Softwood Plywood
- 5. OBC Table 9.23.3.4 Nailing For Framing
- 6. CAN/CSA-080 Wood Preservation
- 7. Graded lumber must be in accordance with rules and regulations of the National Lumber Grades Authority (NLGA).

1.4 Operations

- 1. Do not interrupt or delay Halton District School Board operations.
- 2. Perform operations, at times designated by Halton District School Board, that will not adversely affect occupants of building and operations in and around site access and egress.

1.5 Protection

- 1. Provide perimeter barricades and tarpaulins, guardrails, overhead scaffolding and other necessary protection to ensure safety of occupants, public and site workers.
- 2. Temporarily protect interior spaces, where overhead work is proceeding, and provide dustproof and weatherproof partitions.



1.6 Shop Drawings

1. Submit shop drawings, stamped by a Professional Engineer, licensed in Province of Ontario, if members and securement are part of structural components.

1.7 Permits

1. If required, arrange and pay for all permits, notices and inspections necessary for the proper execution of work in this section.

1.8 Lumber Requirements

- 1. Dimensions of lumber must conform to dressed sizes specified in CAN/CSA-0141. Dimensions specified and shown are nominal sizes.
- 2. Moisture content of lumber at time of installation must be S-DRY maximum 19% moisture content.
- 3. Lumber must be sound and free of splits and deficiencies, which impair strength and durability.

1.9 Securement

- 1. Members shall be framed, anchored, fastened, tied and braced to provide necessary strength and rigidity.
- 2. All nails shall be long enough so that not less than half their required length penetrates into the second member.
- 3. Individual pieces must be secured with minimum of 2 fasteners at all corners.
- 4. Splitting of wood members shall be minimized by staggering nails in the direction of the grain and by keeping nails a minimum of 50 mm (2 in.) in form edges
- 5. Nailing of framing shall conform to OBC Table 9.23.3.4 Nailing For Framing.
- 6. Plywood roof sheathing shall be installed with the surface grain perpendicular to the framing.

2. PRODUCTS

2.1 Material

- 1. Wood Blocking: No.1 Grade, exterior grade 50 x 50 mm (2 in. x 2 in.) 50 x 100 mm, (2 x 4 in.), 50 x 150 mm (2 x 6 n.), 50 x 200 mm (2 x 8 in.), 50 x 250 mm (2 x 10 in.) and 50 x 305 mm (2 x 12 in.) as indicated on drawings and required
- 2. Plywood Sheathing: 13 mm (1/2 in.) and 19 mm (3/4 in.), exterior grade, as indicated on drawings and required.
- 3. Wood Cant: No.1 Grade, Pressure Treated, exterior grade 75 x 75 mm (3 x 3 in.)



- 4. Concrete Board: 16 X 1220 X 2440 mm (5/8 x 48 x 96 in.) Cement Board by DuRock, polymer modified concrete with alkali-resistant fibre glass mesh.
- 5. Fasteners: Are to be of sufficient length to penetrate concrete decks 50 mm (2 in.), metal decks 19 mm (3/4 in.) and wood decks 38 mm (1¹/₂ in.). Acceptable Material:
 - 1. Nails: No. 10 spiral shank, hot dipped galvanized.
 - 2. Wood and Metal Deck Screws (Low profile head):
 - 1. Roofgrip #14 Buildex by ITW Construction Products
 - 2. #14 Heavy Duty Drill Point Fastener by Tru-Fast.
 - 3. Rawl #14 Deck Screw by Rawlplug Canada Ltd.
 - 3. Masonry anchors (Robertson head):
 - 1. Tapcon Plus, 6 mm (1/4 in.) diameter, Climaseal coated by ITW Construction Products.
 - 2. Tap-Grip heavy-duty self-tapping concrete anchors by Perma-Grip Fasteners.
 - 3. Rawl PERMA-SEAL TAPPER, 6 mm (1/4 in.) diameter by Rawlplug Canada Ltd.
 - 4. Steel: use special metal screws, minimum cadmium coating.
- 6. Mechanical Fasteners for Concrete Board:
 - 1. Factory Mutual (FM) Class 1, coated screws and 75 mm (3 in.) galvanized metal plate. Fasteners to be of sufficient length to penetrate metal deck 19 mm (3/4 in.), concrete/masonry 38 mm (1-1/2 in.) and minimum 25 mm (1 in.) into wood deck/planks. *Contractor* shall confirm actual size(s).
- Exposed Sheet Metal Fasteners: #14 AB x 11 mm (7/16 in.) Self-Drilling Hex Head cadmium plated carbon steel, complete with washer and colour coded cap, minimum 38 mm (1-1/2 in.) long.

3. EXECUTION

3.1 Preparation

- 1. Remove all deteriorated existing wood and wood not required to remain. Replace deteriorated members with new and secure as specified.
- 2. *Consultant* shall review structural components deemed not suitable.
- 3. Fasten loose, existing wood members with screws/fasteners to satisfaction of *Consultant*.

3.2 Installation

1. Lay out work to provide a uniform transition for insulation and membrane.



- 2. Cut and fit members accurately. Mitre all corners, leaving no space or unevenness greater than 3 mm (1/8 in.) between components.
- 3. Install continuous plywood sheathing, wood blockings, cants, studs, nailers and continuous shims where required and detailed.
- 4. Erect members in position, align, level, square, plumb and secure permanently in place as specified. Brace work temporarily as required to maintain safely in place.
- 5. Join members over solid substrate, with a minimum end bearing of $38 \text{ mm} (1\frac{1}{2} \text{ in.})$.

3.3 Fastening

- 1. Secure new wood with minimum of 2 fasteners at 610 mm (24 in.) on centre staggered, and as follows:
 - 1. Into masonry: masonry anchors.
 - 2. Into wood: wood screws.
 - 3. Into metal: metal screws.
- 2. Secure new plywood with appropriate fasteners as follows:
 - 1. At 305 mm (12 in.) on centre along perimeter
 - 2. One fastener per 0.3 m² (3 sq. ft.) in field of plywood, each way.

3.4 Parapets/Perimeters/Walls/Curbs/Sleepers

1. Fabricate, construct and modify parapets, perimeters, walls, and curbs as detailed. Where possible, maintain minimum height of 305 mm (12 in.) above finished roof surface for sleepers and curbs.

3.5 Dividers and Movement Joints

- 1. At dividers and movement joints, neatly cut cement board to required dimensions. Cutting shall be done by 'scoring' with carbide tipped utility tool/knife or circular saw with carbide blade. Smooth cut-edges with a wood rasp.
- 2. Secure cement board to substrate using appropriate fasteners, screws and galvanized metal plates (FM Approved) at 205 mm (8 in.) on centre each way and along perimeters.
- 3. Maintain screws 13 mm (1/2 in.) from edges and maintain 3 mm (1/8 in.) gap between each piece of board.

3.6 Clean-up

1. Remove all excess materials, debris, tools and equipment as work proceeds and on completion, or sooner if requested by *Consultant*.

End Of Section 06 10 00



1. **GENERAL**

1.1 Section Includes

- 1. Section includes for provision of all labour, materials, equipment and services for Built-Up Asphalt Roofing in accordance with Contract Documents.
- 2. Contractor shall allow for 92 sq. m. (1,000 sq. ft.) of existing roof system replacement including insulation and 2-ply bituminous felt separation layer, installed in accordance with Contract Documents.

1.2 Related Sections

- 1. Section 06 10 00 Rough Carpentry
- 2. Section 07 62 00 Sheet Metal Flashing and Trim
- 3. Section 07 92 00 Joint Sealers

1.3 References

- 1. CSA A231.1 / CSA A231.2 - Precast Concrete Paving Slabs
- 2. CAN/CSA A123.4 - Asphalt for Constructing Built-Up Roof Coverings and Waterproofing Systems
- 3. CAN/CSA A123.17 – Asphalt Glass Felt Used In Roofing and Waterproofing
- 4. CAN/CSA A123.21 – Dynamic Wind Uplift Resistance of Roof Membrane Systems
- 5. CAN/CSA B149.1 - Natural Gas and Propane Installation Code
- 6. CAN/ULC - S107 - Fire Test of Roof Covering
- CAN/ULC S701 / ASTM C578 Thermal Insulation, Polystyrene, Boards and Pipe 7. Covering
- 8. CAN/ULC – S702 / ASTM C612 – Mineral Fibre Thermal Insulation for Buildings
- 9. CAN/ULC - S704 - Thermal Insulation, Polyurethane and Polyisocyanurate Boards, Faced
- 10. CAN/ULC S706 Wood Fibre Thermal Insulation for Buildings
- CAN/ULC S770 Determination of Long-term Thermal Resistance of Closed-cell 11. **Thermal Insulating Foams**
- 12. CAN/ULC - S114 - Determination of Non-Combustibility in Building Materials
- 13. CGSB-37-GP-56 / ASTM D6164 / ASTM 6163 - Membrane, Modified, Bituminous, Prefabricated and Reinforced for Roofing
- 14. CGSB 37-GP-9 / ASTM D41 - Primer, Asphalt for Asphalt Roofing, Dampproofing and Waterproofing
- 15. ASTM E108/ANSI/UL 790 Fire Tests of Roof Coverings
- 16. ASTM D312 Asphalt Used in Roofing
- ASTM C1177 Glass Mat Gypsum Substrate for Use as Sheathing 17.



- 18. ASTM C1278 Fiber Reinforced Gypsum Panels
- 19. ASTM C1289 Faced Rigid Cellular Polyisocyanurate Thermal Insulation Board
- 20. ASTM D1863 Mineral Aggregate Used on Built-Up Roofs
- 21. ASTM D6164 Styrene Butadiene Styrene (SBS) Modified Bituminous Sheet Materials Using Polyester Reinforcements
- 22. Canadian Roofing Contractors Association (CRCA) Specification Manual
- 23. FM 4470 Approval Standard for Class 1 Roof Covers

1.4 Operations

- 1. Perform operations, at times designated by *Owner*, that will not adversely affect occupants of building and operations in and around site access and egress.
- 2. *Contractor* shall undertake all reasonable measures to reduce vibration and noise level on the roof decks during work hours.
- 3. Should specific complaints be issued by *Owner* to this matter, *Consultant* reserves the right to have *Contractor* proceed with other facets of the Work.

1.5 Shop Drawings and Other Submittals

- 1. Submit to *Consultant* for review, shop drawings, prior to commencement of work. Provide six (6) copies of the shop drawings. Indicate on shop drawings all insulation layers, slopes, crickets, insulation sumps and drainage patterns.
- 2. Submit Shop Drawings for: Tapered Insulation indicating on shop drawings all insulation layers, slopes, crickets, insulation sumps and drainage patterns.
- 3. Submit Shop Drawings for: Gas Line Supports and Roof Access Ladders, stamped by Professional Engineer licensed in province of Ontario.
- 4. Submit Shop Drawings for: Roof Access Ladders and Cross-Over Bridges, stamped by Professional Engineer licensed in province of Ontario.
- 5. Submit Material List and Shop Drawings to Consultant for review prior to ordering materials and commencing Work.
- 6. Construction Schedule: Submit required schedule within 10 days of contract award.

1.6 Quality Assurance

- 1. Skilled trades and *Contractors* having a minimum of five (5) years related experience shall execute roofing Work.
- 2. *Contractors* shall be approved applicators of system specified. Documentation shall be provided prior to commencing Work.



1.7 Roof System Compliance

- 1. Roof system meets requirements of CAN/ULC-S107 "Fire Tests of Roof Coverings', Class A, B or C as listed in the ULC Directory. **Roof system is based on a 4-ply Hybrid Modified Bituminous Membrane System by Soprema Inc.**, *for minimum* <u>standard and performance requirements.</u>
- 2. Alternatives from other manufacturers will be considered upon submittal and review of technical data sheets and fire resistance test results, and warranty specimen demonstrating product equality.
- 3. Approved Alternates include: Henry-Bakor and Johns Manville

1.8 Approved Alternatives

- Requests for Approved Alternatives shall be submitted by **Bidder** in writing and seven (7) working days **prior to Bid Closing** for Halton-District District School Board and *Consultant's* review. Approval (in writing) on all Approved Alternative shall be obtained from *Consultant*.
- 2. Bidder shall include following information: manufacturer's name and supplier's name; change in price; reason for proposing alternate; detailed description of alternate; statement assuming full responsibility of any additional costs/equipment, R-Values and weight/loading calculations, etc.
- 3. Owner and Consultant <u>reserve right, and shall have sole discretion</u>, to accept or reject 'Alternate Prices' and to adjust or reject Bids as required. Approval of any Alternates shall not affect specified warranty requirements.
- 4. Rejection by *Consultant* does not require *Consultant* to become obligated to give any reason for their decision and action.
- 5. Approval (in writing) on all alternative materials and installations shall be obtained from *Consultant* and an Addendum shall be provided for all Bidders.

1.9 Insulation Requirements

- 1. Polyisocyanurate Roof Insulation Manufacturers shall be members of Polyisocyanurate Insulation Manufacturers Association (PIMA). Manufacturers shall submit documentation listing their LTTR values based on CAN/ULC and ASTM test methods for 2014.
- 2. When insulation thickness exceeds 69 mm (2.7 in.), it shall be installed in multiple layers. Minimum thickness for bottom layer shall be 33 mm (1.3 in.) and 38 mm (1.5 in.) for top layer.
- 3. In multiple layer applications, if thicknesses greater than 38 mm (1.5 in.) are required, thicker layer shall be installed in bottom followed by minimum 38 mm (1.5 in.) top layer.
- 4. **Curing Time:** Insulation shall be cured and delivered to site in accordance with Polyisocyanurate Insulation Manufacturers Association (PIMA)



1.10 Warranty

- 1. Provide Ontario Industrial Roofing Contractor's Association (OIRCA) or a Standard Form of Warranty for a <u>period of two (2) years</u> from date of Substantial Performance, <u>including all labour, material and workmanship.</u>
- Provide <u>ten (10) year</u> roof membrane manufacturer's Warranty <u>for labour, materials</u> <u>and workmanship</u> from date of Substantial Performance covering entire roof system and all materials.
- 3. Roofing *Contractor* shall be registered/approved with manufacturer's quality program and submit documentation prior to commencing roofing applications.
- 4. Repair leaks into building or roofing assembly within 24 hours of notification. Repair all roof membrane deficiencies, including ridges, blisters, splits and bare spots.
- 5. Carry out all repair work during warranty period as directed by *Consultant* and at no additional cost to *Owner*. *Contractor* shall extend Warranty on replaced parts and workmanship for a period of two (2) years from date of acceptance of replacement parts and workmanship.
- 6. Defects shall include but will not be limited to: leaking; failure to stay in place; lifting; blow off; deformation; and breaking of weathertight seals.

1.11 Delivery, Storage and Handling

- 1. All materials shall be delivered, stored and handled in accordance with the Contract Documents, be in original manufacturer wrapping with labels intact and clearly identifying the product.
- 2. All modified bitumen membranes that will be used for installation on a daily basis must be stored at a minimum of 15°C (58°F) for a period of at least 4 hours prior to application. Stand rolled materials on end and protect edges.
- 3. Materials transported, stored or handled in a manner that contradicts Contract Documents, shall not be installed at the Place of the Work, shall be marked and removed from site.
- 4. Insulation, vapour retarders and roofing membranes must be kept dry under protective coverings or stored in trailers. Emulsions must be maintained at temperatures above freezing.
- 5. Plastic wrapping installed at the factory <u>is not</u> to be used as an outside storage cover.
- 6. Immediately remove and dispose of wet materials off site. Do not hoist materials with straps/ropes that damage materials. Use specialty supports.
- 7. Hoist material to roof surface daily, for same day use. **Do not 'drop' materials** during handling and installation.



1.12 Environmental Requirements

- 1. Do not install roofing when temperature remains below 0°F (-18°C) for torch applications and 23°F (-5°C) for asphalt applications.
- 2. Removal and installation of any roof components during inclement weather is not permitted.

1.13 Scaffolding, Ladders and Conveyances

- 1. Provide scaffolding, ladders and conveyances required for execution of Work and in accordance with the Contract Documents. Provide all hoisting equipment and barricades required to complete the Work.
- 2. Construct and maintain scaffolding in accordance with authorities having jurisdiction. If required, have scaffolding designed and stamped by Professional Engineer licensed in Province of Ontario.

1.14 Safety Barriers

1. Contractor shall provide upstanding barrier protection at all perimeters, eaves and parapets. **Mesh, screen and tarpaulins shall also be provided to** prevent debris from blowing or falling over edge. Barriers shall be adequately constructed and secured to prevent toppling over.

1.15 Fire Protection

- 1. Comply with Fire Protection and Prevention Act, Ontario Regulation 213/07, Fire Code, Section 5.11 Hot Surface Applications.
- 2. Fire extinguishers must be on site within 3 m (10 ft.) and at same level as torch applicator. Maintain adequate fire watch (as recommended by membrane manufacturer) after each day roofing operations cease and as noted within this section.
- 3. Torches must never be placed near combustible or flammable products. Torches should never be used where flame is not visible or cannot be easily controlled.
- 4. Never apply the torch directly to old and wood surfaces. Maintain adequate fire watch (as recommended by membrane manufacturer) during work and after each day roofing operations cease.
- 5. Maintain <u>minimum four (4) hour fire watch</u> after torch applications have ceased. A hand-held thermal imaging camera shall be used and operated by contractor's competent and trained person in detecting hidden hot spots, who shall maintain a fire watch log. Provide additional protection as required.
- 6. In addition, prior to leaving site, use digital thermometer to scan roof surface temperature for 'any hot spots' and address them accordingly.



7. Maintain an approved fire extinguisher within 3 m (10 ft.) and at same level as torch applicator and open flame. Torches must never be placed near combustible or flammable products. Torches should never be used where the flame is not visible or cannot be easily controlled. Never apply the torch directly to old and wood surfaces.

1.16 Protection

- 1. On a daily basis, provide interior protection to equipment, services, material, floors and walls by use of polyethylene or drop sheets, tape, tarps, plywood sheathing or other means to effectively protect contents.
- 2. Protect work of this section from damage. Damaged work which cannot be satisfactorily repaired, restored or cleaned shall be replaced at no cost to *Owner*.
- 3. Protect work of other sections from damage while performing roofing work. Provide tarpaulins and other coverings, as required, to protect lower and adjacent walls, finishes and surfaces. Additional protection shall be provided if instructed by *Consultant*.
- 4. Work is to be performed on occupied buildings. Take all reasonable precautions to protect against entry of elements and persons to unauthorized areas. Prevent precipitation and debris entering openings and drains during work. Prevent damage to site, roads, curbs and building elements.
- 5. Protect finished roof surfaces with minimum 13 mm (1/2 in.) plywood sheathing with 25 mm (1 in.) polystyrene insulation board on underside. Weigh in place or remove when not in use.
- 6. Damaged areas and surfaces shall be repaired to satisfaction of *Consultant* at no additional cost to *Owner*.

1.17 Temporary Facilities

- 1. Provide temporary storage facilities for materials, tools and equipment. Location to be approved by *Owner*. Provide temporary washroom facilities for workers. Secure portable washrooms to adjacent fences or walls to prevent toppling over.
- 2. Ground work stations shall be fully enclosed by temporary fencing and be manned at all times.

3. Kettles and disposal bins shall be located minimum 2 m (6'-6") away from building walls.

1.18 Fastenings

- 1. Fasteners, anchors and adhesives shall be of appropriate size and type and must be used in sufficient quantity to provide positive and permanent anchorage of component.
- 2. Fastenings which cause spalling or cracking of material to which anchorage is being made are not permitted. **Powder-actuated** fastening devices are not permitted on this project. Only low velocity plunger-type devices are permitted.



1.19 Available Project Information

- 1. Available Project Information was obtained from limited cut-tests.
- 2. Bidders shall confirm all existing assemblies.
- 3. This information is provided to Bidders as a guideline only and Bidders shall not hold Alspex Building Consultants Inc., *Owner* or any other third party liable for any errors or omissions resulting from this information.

4. Existing Roof System

1. Roof Areas Da & D, E

Surfacing: Roof Membrane: Overlay Insulation: Inter-Ply Membrane Base Insulation: Vapour Retarder: Deck: Bitumen and Gravel Surface 4-Ply Bituminous Felt Membrane 13mm (1/2 in.) Fibreboard 2-Ply Bituminous Felt and Bitumen 56 mm (2-1/4 in.) Fibreglass Asphalt Laminated Kraft Paper Metal

2. Roof Area C

Surfacing: Roof Membrane: Overlay Insulation: Inter-Ply Membrane Base Insulation: Vapour Retarder: Deck:

3. Roof Area F

Surfacing: Roof Membrane: Overlay Insulation: Inter-Ply Membrane Base Insulation: Vapour Retarder: Deck:

4. Roof Area D1

Surfacing: Roof Membrane: Overlay Insulation: Deck: Bitumen and Gravel Surface 4-Ply Bituminous Felt Membrane 13mm (1/2 in.) Fibreboard 2-Ply Bituminous Felt and Bitumen 56 mm (2-1/4 in.) Polyisocyanurate Asphalt Laminated Kraft Paper Metal

Bitumen and Gravel Surface 4-Ply Bituminous Felt Membrane 13mm (1/2 in.) Fibreboard 2-Ply Bituminous Felt and Bitumen 56 mm (2-1/4 in.) Fibreglass 2-Ply Felt Membrane & Bitumen Concrete

Bitumen and Gravel Surface 4-Ply Bituminous Felt and Bitumen 25mm (1 in.) Fibreboard Metal



1.20 New Roof System(s)

New Roof System(s) at Place Of The Work are as follows and include all miscellaneous items;

1. Roof Areas D, Da & E

New Surfacing: New Roof Membrane: New Overlay Board: New Base Insulation:

New Tapered Insulation: Existing Inter-Ply Membrane Existing Base Insulation: Existing Vapour Retarder: Existing Deck:

2. <u>Area D – Infill at Skylights</u>

- 1. New Surfacing:
- 2. New Roof Membrane:
- 3. New Overlav Board:
- 4. New Base Insulation:
- 5. New Tapered Insulation:
- 6. New Inter-Ply Membrane
- 7. New Base Insulation:
- 8. New Vapour Retarder:
- 9. New Deck & Supports:

10. Roof Area C

New Surfacing: New Roof Membrane: New Overlay Board: New Tapered Insulation: Existing Inter-Ply Membrane Existing Base Insulation: Existing Vapour Retarder:

11. Roof Area F

Existing Deck:

New Surfacing: New Roof Membrane: New Overlay Board: New Tapered Insulation: Existing Inter-Ply Membrane: Existing Base Insulation: Existing Vapour Retarder: Existing Deck:

12. Roof Area D1

New Surfacing: New Roof Membrane: New Overlay Board: New Tapered Insulation: New Base Insulation: Existing Deck: Bitumen and Gravel Surface 1 + 3 Ply Bituminous Membrane 13mm (1/2 in.) Fibreboard 63 mm (2-1/2 in.) Flat Polyisocyanurate Beyond Tapered on Area D

Tapered Polyisocyanurate 2-Ply Bituminous Felt and Bitumen 56 mm (2-1/4 in.) Fibreglass Asphalt Laminated Kraft Paper Metal

Bitumen and Gravel Surface

1 + 3 Ply Bituminous Membrane
13mm (1/2 in.) Fibreboard
63mm (2-1/2 in.) Polyisocyanurate
Tapered Polyisocyanurate
2-Ply Glass Felt and Bitumen
56 mm (2-1/4 in.) Polyisocyanurate
Self-Adhesive Vapour Retarder
Metal Deck & Steel Supports (As Per Structural)

Bitumen and Gravel Surface 1 + 3 Ply Bituminous Membrane 13mm (1/2 in.) Fibreboard Tapered Polyisocyanurate 2-Ply Bituminous Felt and Bitumen 56 mm (2-1/4 in.) Polyisocyanurate Asphalt Laminated Kraft Paper Metal

Bitumen and Gravel Surface 1 + 3 Ply Bituminous Membrane 13mm (1/2 in.) Fibreboard Tapered Polyisocyanurate 2-Ply Bituminous Felt and Bitumen 56 mm (2-1/4 in.) Fibreglass 2-Ply Felt Membrane & Bitumen Concrete

Bitumen and Gravel Surface 1 + 3 Ply Bituminous Membrane 13mm (1/2 in.) Fibreboard Tapered Polyisocyanurate 25mm (1 in.) Polyisocyanurate Metal



2. PRODUCTS

2.1 Material

- 1. Primer:
 - 1. Asphalt Cutback Primer
 - 2. Modified Membrane Primer: Elastocol 500 by Soprema Inc.
 - 3. Self-Adhesive Membrane Primer: Elastocol Stick by Soprema Inc.
 - 4. Metal Deck Primer: Rustguard Q.D. Shop Coat Primer by Devoe Coatings
 - 5. Pitch Primer: Universal Primer as manufactured by Millennium Adhesive Company and supplied by Soprema Inc.

2. Area D – Material for Skylight Infill

- 1. Vapour Retarder: Sopravap'r and Elastocol Stick Primer by Soprema Inc.
- 2. Insulation: 58 x 1220 x 1220 mm (2-1/4 in. x 4 ft. x 4 ft.), comprising of rigid closed cell polyisocyanurate foam core, bonded with all inorganic fibre glass reinforced facer on each side.
- 3. Mechanical Fasteners: As noted in Article 2.1.4 in this Section.
- 4. Overlay Board: High Density Fibreboard as noted in Article 2.1.8 in this Section.
- 5. Separation Layer: Sopra IV Glass Felt by Soprema Inc.
- 3. Asphalt for Insulations, Overlay Board and Membrane:
 - 1. Type II and Type III by Bitumar
 - 2. Approved Alternate
- Mechanical Fasteners for Base Layer Insulation Area D1 & Skylight Infill in Area D: Factory Mutual (FM) Class 1, No.12 coated screws and 75 mm (3 in.) galvanized metal plate. Fasteners to be of sufficient length to penetrate <u>crest</u> of metal deck 19 mm only (3/4 in.) and minimum 25 mm (1 in.) into wood deck/planks. *Contractor* shall confirm actual size(s).
- 5. Base Insulation Area D (Beyond Tapered Sumps): 75 mm x 1220 x 1220 mm (2-1/2 in. X 4 ft. x 4 ft.), comprising of rigid closed cell polyisocyanurate foam core, bonded with <u>all fibre glass reinforced facer on each side</u>. Minimum long-term thermal resistance for 2014 material (LTTR) of RSI 1.00 (R 5.7) per 25 mm (1 in.) thickness.
 - 1. SOPRA-ISO Plus by Soprema Inc.
 - 2. AC Foam III by Atlas Corporation Ltd.



- Base Insulation Area D1: 25 mm x 1220 x 1220 mm (1 in. X 4 ft. x 4 ft.), comprising of rigid closed cell polyisocyanurate foam core, bonded with <u>all fibre glass</u> <u>reinforced facer on each side</u>. Minimum long-term thermal resistance for 2014 material (LTTR) of RSI 1.00 (R 5.7) per 25 mm (1 in.) thickness.
 - 1. SOPRA-ISO Plus by Soprema Inc.
 - 2. AC Foam III by Atlas Corporation Ltd.

Note: All polyisocyanurate insulation boards shall be provided by one manufacturer with same production dates and lot numbers and letter submitted regarding claimed R-values.

- Tapered Insulation: Fabricated from rigid closed cell polyisocyanurate foam core, bonded with <u>all fibre glass reinforced facer on each side</u> to layouts and slopes (0.5%, 0.75%, 1.0%, 2.0% or 4.0%) as indicated on drawings. Minimum thickness 13 mm (1/2 in.) 1220 x 1220 mm (4 x 4 ft.), SOPRA-ISO Plus by Soprema Inc. Acceptable Suppliers:
 - 1. Accu-Plane Enterprises Inc.
 - 2. Posi-Slope Enterprises Inc.

Filler pieces shall not exceed 63 mm (2.5 in.) per layer and shall be same material as tapered.

- Tapered Edge Strip (<u>To be Used with Tapered Polyisocyanurate</u>): Fabricated from high density, wax impregnated rigid fiberboard. Density to be a minimum of 0.27 g/cm³ (17 pcf). Compressive strength minimum of 289 kPa (42 psi) at 5% consolidation. Minimum thickness of 0 mm (0 in.) to 13 mm (1/2 in.) by 305 mm (12 in.) wide. Acceptable Suppliers:
 - 1. Accu-Plane Enterprises Inc.
 - 2. Posi-Slope Enterprises Inc.
- Overlay Board: 13 x 1220 x 1220 mm (1/2 in. x 4 ft. x 4 ft.) high density asphalt impregnated and coated wood fibreboard. Density to be a minimum of 0.27 g/cm3 (17 pcf). Compressive strength to be a minimum of 310 kPa (45 psi) at 5% consolidation. Acceptable Material:
 - 1. High Density Fibreboard by Louiseville Specialty Products
 - 2. High Density Fibreboard by RoofRite International Bildrite, Inc.
 - 3. Structodek HD Fibreboard by Blue Ridge Fibreboard Inc.
- 10. Protection Board (At Drain Sump): 6.4 x 1220 x 1525 mm (1/4 in. x 4 ft. x 5 ft.) semirigid protection board composed of a mineral fortified asphaltic core formed between two saturated fibreglass felts.
 - 1. Sopraboard by Soprema Inc.



- 11. Mineral Fibre Cant: 100mm wide x 38mm thick x 1220mm long (4 in.x1.5 in.x48 in.) rigid mineral wood fibre, manufactured from basalt rock and steel slag with a bitumen saturated surface, 'CantRSS' by ModulR TS
- 12. Modified Bituminous Membrane Base Sheet: SBS polymer modified, non-woven polyester reinforced sheet, minimum 2.2 mm (0.09 in.).
 - 1. Elastophene Sanded 2.2 by Soprema Inc.
- 13. Glass Felt: Type IV membrane composed of a glass mat reinforcement coated with oxidized bitumen.
 - 1. Sopra IV by Soprema Inc.
- 14. Modified Bituminous Membrane Base Sheet Flashings:
 - 1. Elastphene 180 PS by Soprema Inc. general flashings
 - 2. Sopraflash Stick 20 by Soprema Inc. for exterior of perimeters
 - 3. Sopralene Flam 180 by Soprema Inc. for flange flashings
- 15. Modified Bituminous Membrane Cap Sheet Flashings:
 - 1. Sopralene Flam 250 GR by Soprema Inc. (Grey Colour)
- 16. Membrane Flashing Cold Adhesive: Colply EF Flashing by Soprema Inc.
- 17. Modified Bituminous Membrane Liquid Flashings: Polyurethane/bitumen resin 'Alsan Flash' and 152 mm (6 in.) wide fabric reinforcement by Soprema Inc.
- 18. Pea Gravel Aggregate: 6 to 13mm (1/4 in. to 1/2 in.), well graded, round, opaque, non-porous material, washed, free of fines, moisture, ice and snow and long splinters.
- 19. Mastic: As per membrane manufacturer's requirements
- 20. Pitch-Pans:
 - 1. Sopramasrtic Block and Sopramastic PF sealant by Soprema Inc.
 - 2. ChemCurb System by Chem Link, which shall include sealer and filler.
 - 3. Fabricated from 0.71 mm (24 gauge) stainless steel, 102 mm (4 in.) high with 152 mm (6 in.) wide flanges, all seams continuously soldered. Allow 52 mm (2 in) gap all around protrusion for pitch-pan filler.
- 21. Round Top Cap Nails: Ardox spiral shank with 25 mm (1 in.) steel washer
- 22. Bulk Granules: Coloured granules in bulk to match cap sheet.
- 23. Rough Carpentry: As per Section 06 10 00 Rough Carpentry.
- 24. Metal Flashing: As per Section 07 62 00 Sheet Metal Flashing and Trim.
- 25. Sealants: As per Section 07 92 00 Joint Sealers.



2.2 Roofing Accessories

- 1. Roof Drains: Prefabricated Aluminum Roof Drain complete with nuts and bolts, clamping ring, aluminum locking drain strainer and mechanical (MJ) connections, minimum 100 mm (4 in.) diameter or to suit maximum on-site diameter. Acceptable Material:
 - 1. RD-24A Vandalproof Roof Drain, T-6 Ferrule and T-7 Aluminum Control Flow by Thaler Metal Industries Ltd.
 - 2. ABD-CR-SU Heavy Duty Aluminum Body and Aluminum Control Flow by Altra Metal Specialties Inc.
 - 3. Inserts are not acceptable. Size of drainage pipe shall not be reduced in direction of flow.
- 2. Drain/Plumbing Couplings: 'Fernco Flexible Coupling', of appropriate size and type to suit site conditions by Fernco Connectors Ltd.
- 3. Rain Water Leader: Non-combustible material - cast iron or copper, to suit maximum size on site or minimum 75 mm (3 in.) diameter for new drains, and all accessories for securing and hanging rain water leader, in accordance with authorities having jurisdiction.
- 4. Pipe Fittings: Pipe fittings shall be approved for installation with piping material and comply with respective pipe standards and codes.
- 5 Vent (Soil) Pipe Sleeves: 1.6 mm (0.64 in.) thick, 75 or 102 mm (3 or 4 in.), one piece spun aluminum pre-insulated stack jack. To be minimum of 305 mm (12 in.) above finished roof surface. Diameter to suit site conditions. Acceptable Material:
 - 1. SJ-38 Insulated Stack Jack Flashing by Thaler Metal Industries Ltd.
- 6. Exhaust / Hot Stack Sleeve Flashing: One piece spun aluminum, to be a minimum of 305 mm (12 in.) above finished roof surface with storm collar. Diameter to suit site conditions. Acceptable Material:
 - 1. BVF Seamless Spun Aluminum B-Vent Flashing with Rain Collar by Altra Metal Specialties Inc.
 - 2. Fabricated from 0.56 mm (16 oz.) Copper or 0.71 mm (24 gauge) stainless steel. Provide a continuous sleeve with a minimum height of 305 mm (12 in.) above finished roof surface complete with a storm collar. Sleeve flange shall have a 150 mm (6 in.) wide apron with continuously soldered seams.
- 7. Storm Collars and Clamps: Fabricated from same material as exhaust stacks and sleeves, with continuously soldered seams and extending a minimum of 52 mm (2 in.) down face of sleeve. Allow 6 mm (1/4 in.) gap between storm collar and sleeve.
- 8. Insulation Stop: Fabricated from 0.56 mm (16 oz.) Copper or 0.71 mm (24 gauge) stainless steel. Provide Insulation Stop with a minimum height of insulation plus 13 mm (1/2 in.). Sleeve flange shall have a 150 mm (6 in.) wide apron with continuously soldered seams.



- 9. Conduit / Gas Penetration Sleeve Flashing: Size, number and type to suit existing conduit / pipe penetrations and configuration. Acceptable Material:
 - 1. "MEF Series" Aluminum Pre-Insulated Flashing for Multiple Conduits by Thaler Metal Industries Ltd.
 - 2. MEF-9 Modcom Gas Pipe Flashing by Thaler Metal Industries Ltd. ORMEFA by ALTRA Metal Specialties Inc.
 - Multiple / Custom: Fabricated from 0.56 mm (16 oz.) Copper or 0.71 mm (24 gauge) stainless steel. Provide a continuous sleeve with a minimum height of 305 mm (12 in.) above finished roof surface complete with a storm collar. Sleeve flange shall have a 150 mm (6 in.) wide apron with continuously soldered seams.
- 10. Goose Necks: Fabricated from 0.71 mm (24 gauge) stainless steel, 305 mm (12 in.) high with 152 mm (6 in.) wide flanges, separate cap with 150 mm (6 in.) neck that is sloped downward and all seams continuously soldered. Opening shall only be large enough for quantity of conduits/pipes required.
- 11. Closure Plates:
 - 1. Minimum 1.6 mm (16 gauge) galvanized steel plates for openings up to 250 mm (10 in.) or less in width and length and minimum 150 mm (6 in.) wider than opening on all sides.
 - 2. For openings up to 610 mm (24 in.), provide adequate structural supports from beneath and provide 5 mm (3/16 in.) galvanized steel plate secured to supports with appropriate fasteners. Plates to be a minimum 125 mm (5 in.) wider than opening on all sides.
 - 3. A Professional Engineer registered in the Province of Ontario shall design openings greater than noted above.
- 12. Precast Concrete Pavers: 52 x 610 x 610 mm (2 x 24 x 24 in.) "Brooklin Roof Ballast' slabs with Built-In Pedslab Pedestal System", as manufactured by Brooklin Concrete Products Limited. Colour to be natural with standard diamond texture.
- 13. Paver / Gas Line Support Pedestals: 25 mm (1 in.) "Roofmate" as manufactured by Dow Chemical Canada Ltd. or Foamular 250 by Owens-Corning.
- 14. Sprayed polyurethane foam insulation: one component polyurethane foam insulating sealant.
 - 1. ENERFOAM by Abisko Manufacturing Inc.
 - 2. Duotack by Soprema Inc.
- 15. Mineral Batt Insulation: Roxul Mineral Batt, of size and thickness to suit site requirements.
- 16. Aprons: Fabricated from 0.87 mm (0.034 in.) galvanized metal flashings to profile detailed.
- 17. Butyl Tape: 3 mm x 13 mm (1/8 x 1/2 in.) wide elastomeric butyl rubber.


- 18. Termination Bar: 3 mm thick x 25 mm wide (1/8 x 1 in.) Extruded Aluminum, 'TB-100 Termination Bar' with sealant edge by Trufast.
- Overflow Scuppers (Where Shown on Drawings): Fabricated from 0.71 mm (24 gauge) stainless steel. To be a minimum 250 mm wide x 150 mm high (10 x 6 in.) with continuously soldered seams with a 150 mm (6 in.) wide apron/flanges. Overflows to be open ended with bottom drip edge to extend 38 mm (1-1/2 in.) past wall/fascia.
- 20. Gas Line & Conduit/Pipe Supports: Channel or roller type, appropriate size to accommodate on-site gas/pipe sizes and to support all weights, as supplied and designed by Portable Pipe Hangers (Canada Inc.) with all required hardware.

Note: Supports shown on drawings are only for illustration purposes only. Actual quantity and locations shall be shown on supplier shop drawings.

- 21. Gas Line Primer and Paint: Anti-Corrosive Industrial Enamel, OSHA Safety Yellow.
- 22. Roof Access Ladders: Pre-engineered Aluminum Access Ladder (or galvanized steel) and Powder Coated, (<u>with cage where required</u>), walkthrough landing/platform at top with guard rails/toe board, offset bracket, fasteners, etc. and designed by Professional Engineer licensed in Province of Ontario, and in accordance with Ministry of Labour Guidelines for Fixed Access Ladders. Acceptable Supplier:
 - 1. Portable Pipe Hangers (Canada Inc.)
 - 2. **Note:** Top portion of ladder / landing shall be provided with galvanized steel 'ladder supports' for placement of minimum 3 precast pavers onto the roof for counterweight. System shall be part of roof ladder design. Under no circumstance will a ladder with any movement / sway be accepted.
- 23. Guy Wire Roof Support: ARS 300 Guy Wire Roof Support by Thaler Metal Industries Ltd. Provide Urethane Insulated Aluminum Stack Jack, Galvanized Forged Steel Eye and metal Cap with 75 mm (3 in.) vertical face.



3. EXECUTION

3.1 Workmanship

- 1. Do work in accordance with Canadian Roofing Contractors Association Roofing Specifications Manual (CRCA) and Manufacturer's requirements except as specified within Contract Documents and to approval of *Consultant*.
- 2. More stringent requirements shall govern.

3.2 Examination and Preparation

- 1. Examine site conditions and surfaces to ensure that they are in satisfactory condition for the commencement of Work of this section.
- 2. Ensure that substrates are smooth, clean and dry. Clean surfaces of all substances, which may be detrimental to new roof system. Clean adhesives with solvent and allow vapours to dissipate prior to membrane application.
- 3. Application of the Work, or any part of it will constitute acceptance of conditions upon which work is to proceed.

3.3 Abandoned Skylights, Curbs, Equipment and Deck Closures

1. Remove abandoned skylights and curbs and provide <u>new steel and deck</u> closures over openings, as per Structural Drawings and new Roof System in accordance with this Section..

3.4 General Requirements

- 1. Complete new roof system to membrane base sheet and membrane flashings to each day's termination point and install temporary water cut-off. Remove water cut-off when work resumes.
- 2. If membrane is to be left exposed and there is a possibility of frost or dew, it shall be glaze coated.
- 3. Materials shall not be installed during inclement weather, rain or snowfall.
- 4. Roofing materials, applications and systems shall be left in a watertight condition at end of day's work, everyday.

3.5 Primer

- 1. All surfaces to be primed shall be free of rust, dust or any residue that may hinder adherence.
- Apply primer to curbs, wall, wood and metal at a minimum rate of 0.2 to 0.3 litres/m² (0.5-0.75 gal / 100 sq. ft.) with roller or spray. Do not allow primer to puddle.



- 3. Prevent primer from entering building interior through openings and joints in metal decks, by installing self-adhesive membrane at roof perimeters, walls, curbs and other roof openings.
- 4. Allow primer to cure prior to application of new roofing membrane or membrane flashings as detailed. Do not accelerate drying time by use of flame.
- 5. Self-adhesive membranes must be applied same day as primer.

3.6 Preparation of Asphalt

- 1. Asphalt shall be heated in kettle, equipped with a circulating pump, sufficiently to provide Equiviscous Temperature (EVT) at point of application. Do not heat asphalt above its Final Blowing Temperature (FBT). Suppliers shall provide lot-specific EVT'S for mopping applications.
- 2. General asphalt temperature applications shall be in the range of: 220°C (428°F) to 260°C (500°F).
- 3. Equip kettles with working thermometers that accurately register asphalt temperatures at all times. Asphalt heated beyond 260°C (550°F) will be rejected and shall not be used.
- 4. Asphalt shall be applied at temperature <u>not to exceed 235°C (450°F</u>) for Polyisocyanurate insulation.
- 5. Asphalt shall be applied at temperature of <u>205°C (400°F</u>) for glass felts.
- 6. It is Contractor's sole responsibility to provide staff with temperature measuring devices to monitor kettle temperature and application temperature of asphalt. Asphalt temperatures shall be continuously monitored to maintain required range.

3.7 General Requirements

- 1. Asphalt and Modified Asphalt Quantities (Unless otherwise noted):
- 2. 1.0 kg/m² (22 lbs./100 ft2) asphalt for each glass felt mopping.
- 3. 1.25 kg/m² (25 lbs./100 ft2) asphalt for each felt mopping.
- 4. 1.25 kg/m² (25 lbs./100 ft2) asphalt for mopped topcoat.
- 5. 3.0 kg/m² (60 lbs./100 ft2) asphalt for pour coat (If pea gravel used).
- 6. Type 2 for slopes up to 125 mm/m (1.5 in./ft) (1:8)
- 7. Type 3 for slopes greater than 125 mm (1.5 3.0 in.) (1:8 1:4) and membrane flashings
- 8. Complete new roof system, including vapour retarder, insulations and membrane and membrane flashings to each day's termination point and install temporary water cutoff. Remove water cut-off when work resumes.



3.8 Roof System at Skylight Infill Area D

- 1. At all roof perimeters, walls, curbs, dividers, movement and control joints and penetrations, provide 200 mm (8 in.) self-adhesive reinforcing vapour retarder to seal openings/gaps at junction of wall and deck, to prevent primer/asphalt seepage into building.
- 2. Roll out vapour retarder on dry and clean metal and wood deck. Peel back first 1000 mm (3 ft.) of release paper and adhere vapour retarder in place. Hold vapour retarder tight and peel off remaining release film diagonally.
- 3. Apply additional rolls in similar fashion and maintain 75 mm (3 in.) side laps and 150 mm (6 in.) end laps. **Side laps shall bear on crest of metal deck.** Roll vapour retarder onto deck and ensure all laps are sealed.
- 4. Install first layer base insulation over vapour retarder and mechanically secure into substrate to Factory Mutual FM 1-90 requirement layout pattern of five (5) fasteners per 1220 x 1220 mm (4 x 4 ft.) board, as per details on drawing.
- 5. Maintain fasteners a minimum of 150 to 305mm (6 to 12 in.) from all perimeters and corners. Provide 50% more fasteners for 2440 mm (8 ft.) perimeters and 75% more at corners for 3660 mm (12 ft.) each way.
- 6. Ensure fasteners adequately engage and penetrate crest of metal deck 19 mm (3/4 in.) or embedded into wood deck 25 mm (1 in.). Fasteners that do not engage the substrate, shall be removed and re-installed. **Do not overdrive or underdrive fasteners.**
- 7. Stagger all joints in insulation boards within each adjacent layer and between lower and upper layers. Walk insulation into hot asphalt to achieve solid bond, immediately after placement.
- 8. Install insulation boards ensuring panels are tightly butted and end joints between panels are staggered 610 mm (24 in.), each way.
- 9. Do not lay more insulation/board than can be covered with roof membrane on same day. Insulation, which is damaged by moisture, shall be marked and promptly removed from site.
- 10. Glass Felt Membrane: Over base layer insulation, apply 2-plies of glass felt in solid mopping of Type 2 liquid hot asphalt with a mop, applied at rate of 1.2 kg/m² (25 lbs./100 ft²). Extend all plies to top of cant. Applications shall commence at low point and conform to manufacturer's written instructions and literature for starter strips, side lap, end lap exposure and staggering of end laps. Minimum side laps shall be 280 mm (11-1/8 in.).
- 11. Thoroughly and effectively roll membrane/felt into asphalt to ensure full contact and adhesion. Do not step or walk on membranes during or immediately after application until bitumen has set.
- 12. Roll each ply into uniform mopping of asphalt and ensure there is no 'dry felt'. Do not walk on newly laid felts until bitumen has solidified.



3.9 Base Insulation Area D1 – Metal Deck

- 1. Contractor shall provide electronic equipment to 'locate electrical/mechanical services' on underside of deck. <u>Contractor shall be responsible for any damage.</u>
- 2. Install first layer base insulation over vapour retarder and mechanically secure into substrate to Factory Mutual FM 1-90 requirement layout pattern of five (5) fasteners per 1220 x 1220 mm (4 x 4 ft.) board, as per details on drawing.
- 3. Maintain fasteners a minimum of 150 to 305mm (6 to 12 in.) from all perimeters and corners. Provide 50% more fasteners for 2440 mm (8 ft.) perimeters and 75% more at corners for 3660 mm (12 ft.) each way.
- 4. Ensure fasteners adequately engage and penetrate crest of metal deck 19 mm (3/4 in.) or embedded into wood deck 25 mm (1 in.). Fasteners that do not engage the substrate, shall be removed and re-installed. **Do not overdrive or underdrive fasteners.**
- 5. Base insulation shall be reduced 13 mm (1/2 in.) for 1220 mm (4 ft.) centred at drain sump as noted on drawings. Transition shall be 'shaved' to provide a smooth surface for tapered insulation or overlay board.
- 6. At junction with wood blocking at parapets, walls and curbs, neatly trim insulation to suit profile of wood assembly and to provide a tight/butt joint.
- 7. Stagger all joints in insulation boards within each adjacent layer and between lower and upper layers. Walk insulation into hot asphalt to achieve solid bond, immediately after placement.
- 8. Install insulation boards ensuring panels are tightly butted and end joints between panels are staggered 610 mm (24 in.), each way.
- 9. Do not lay more insulation/board than can be covered with roof membrane on same day. Insulation, which is damaged by moisture, shall be marked and promptly removed from site.

3.10 Tapered Insulation

- 1. Tapered insulation shall be applied over base insulation and under overlay board.
- 2. Install tapered insulation, sumps, crickets and backslope in a full mopping of liquid hot asphalt, applied at a rate of 1.25 kg/m² (25 lbs./100 ft²), in accordance with reviewed shop drawings and to minimize water ponding. Provide tapered edge strip where tapered insulation terminates at 13 mm (1/2 in.).
- Insulation shall be immediately placed and walked into hot asphalt to achieve solid bond, immediately after placement. Cut insulation boards to fit snugly within 6 mm (1/4 inch) of board joints, perimeters, penetrations, etc., but not oversized to damage vapour barrier during installation.



- 4. <u>Tapered sump shall be installed in its entirety the same day.</u> Under no circumstance shall sump be installed in more than one application as to build-in a high point within sump area.
- 5. Do not lay more insulation than can be covered with base sheet / overlay board on same day. Transitions shall be 'shaved' to provide a smooth surface for tapered insulation or overlay board.

3.11 Base Insulation Area D – Over Existing Bituminous Separation Layer

- 1. At junction with wood blocking at parapets, walls and curbs, neatly trim insulation to suit profile of wood assembly and to fit snugly within 6 mm (1/4 inch) of board joints, perimeters, penetrations, etc.
- Apply overlay board in a full mopping of liquid hot asphalt, applied at a rate of 1.25 kg/m2 (25 lbs./100 ft2). Embed overlay board into hot asphalt and weigh down / roll into place to achieve solid bond. Walk insulation into hot asphalt to achieve solid bond, immediately after placement.
- 3. Install insulation boards ensuring panels are tightly butted and end joints between panels are staggered 610 mm (24 in.), each way and minimum 305 mm (12 in.) to underlying insulation joints.
- 4. Do not lay more boards than can be covered with roof membrane base sheet on same day. Boards that are damaged shall be marked and promptly removed from site.
- 5. Insulation, which is damaged by moisture, shall be marked and promptly removed from site.

3.12 Overlay Board – Over Tapered and Base Insulation, All Areas

- 1. Top layer of base insulation shall be free of debris, dust or any residue that may hinder adherence of the base sheet / overlay board.
- Apply overlay board in a full mopping of liquid hot asphalt, applied at a rate of 1.25 kg/m² (25 lbs./100 ft²). Embed overlay board into hot asphalt and weigh down / roll into place to achieve solid bond.
- 3. Install overlay boards ensuring panels are tightly butted and end joints between panels are staggered 610 mm (24 in.), each way and minimum 305 mm (12 in.) to underlying insulation joints. Cut boards to fit snugly within 6 mm (1/4 inch) of board joints, perimeters, penetrations, etc.
- 4. Do not lay more boards than can be covered with roof membrane base sheet on same day. Boards that are damaged shall be marked and promptly removed from site.

3.13 Mineral Fibre Cant

1. Install mineral fibre cants at all junctions between horizontal and vertical surfaces. Provide tight flush joints between length of cants and mitre corners.



- 2. Embed cants in full mopping of liquid hot asphalt applied at a rate of 1.25 kg/m² (25 lbs./100 ft²) and press into place for solid contact.
- 3. Trim cants (overall height) to suit new roof elevations. In no case shall top of cant extend above parapet, curbs or walls.

3.14 Roof Membrane

- 1. New membrane shall consist of <u>1-ply Modified Bituminous Membrane Base Sheet</u> and 3-plies Glass Felt.
- 2. Unroll modified membrane base sheet and allow to relax as required by manufacturer. Align dry and position in place and apply membrane base sheet centre within drain or commencing at low point working upslope with side laps to shed water. At end laps, cut 45° dog-ear away from selvage edge at all T-joints.
- 3. Embed modified membrane base sheet in solid mopping of liquid hot asphalt applied at rate of 1.2 kg/m² (25 lbs./100 ft²) and extend to top of cant. Use chalklines to maintain neat and straight lines. Maintain minimum 75 mm (3 in.) side and 150 mm (6 in.) end laps. End laps shall be staggered from adjacent rows minimum 305 mm (12 in.)
- 4. Glass Felt Membrane: Over completed modified membrane base sheet, apply 3-plies of glass felt in solid mopping of Type 2 liquid hot asphalt with a mop, applied at rate of 1.2 kg/m² (25 lbs./100 ft²). Extend all plies to top of cant. Applications shall commence at low point and conform to manufacturer's written instructions and literature for starter strips, side lap, end lap exposure and staggering of end laps. Minimum side laps shall be 280 mm (11-1/8 in.).
- 5. Roll each ply into uniform mopping of asphalt and ensure there is no 'dry felt'. Lay felts smooth, free of wrinkles, air pockets, fish mouths, tears or prominent lap joints.
- 6. Lay felts across slope starting at low point so that the flow of water is over or parallel to, but never against the laps. Apply felts continuous to top of cant. Do not walk on newly laid felts until bitumen has solidified.
- 7. Thoroughly and effectively roll membrane/felt into asphalt to ensure full contact and adhesion. Do not step or walk on membranes during or immediately after application until bitumen has set.
- 8. Apply membrane/felt without voids, wrinkles, buckles, fishmouths or any evidence of a lack of full adhesion. Deficiencies must be repaired to satisfaction of manufacturer and *Consultant*.
- 9. Allow minimum of 12 hours and maximum five (5) days for roof membrane to solidify before application of gravel pour.
- 10. Do not 'empty/dump' excess bitumen on roof surface/membrane so that it impedes surface drainage. *Consultant* may request that bitumen/membrane be removed and new membrane applied.



3.15 Modified Bituminous Membrane Base Sheet Flashings

General Application Guidelines

- 1. Apply appropriate primer to surfaces that are to receive membrane flashings at rates recommended by manufacturer. Allow primer to 'flash off' prior to membrane flashing application.
- 2. Apply membrane base sheet flashings in general conformance with details commencing from low point and working up-slope. Maintain minimum 75 mm (3 in.) side laps. Laps shall be installed to shed water.
- 3. Apply base sheet flashing in maximum 1 m (3.25 ft.) wide strips in solid mopping of Type 3 liquid hot asphalt applied at rate of 1.2 kg/m² (25 lbs./100 ft²) and extending from outside edge of perimeters/parapets and minimum 150m (6 in.) beyond toe of cant (or vertical transition) onto field of roof.
- 4. At wall and curbs, provide mechanical fasteners within laps of base sheet flashing, prior to applying succeeding sheet. Fasteners shall be installed at maximum 100 mm (4 in.) on centre commencing from 200 mm (8 in.) above roof membrane.
- 5. Extend modified bituminous base sheet flashing over parapet, perimeter and eaves down outside face of walls 38 mm (1 ½ in.) onto lower substrate. Secure membrane flashing with large head galvanized nails at 150 mm (6 in.) on centre. Laps shall be 'torch welded' where noted to be incomplete or open.
- 6. At exterior face of parapets / perimeters, apply self-adhesive base sheet flashing, to provide continuous cover over exposed wood and joints between substrates as detailed. Overlap self-adhesive base sheet under overhang of membrane base/cap sheet flashings at top edge of parapets / perimeters.
- 7. Apply base sheet flashing without wrinkles, air pockets or fish mouths. Repair defects in applications with additional piece of torch grade base sheet. Carry out repairs to satisfaction of *Consultant*.

Hot Asphalt Applications

- 8. **Base sheet flashing shall be applied using 'mop and flop' technique.** Place base sheet with back side facing up and apply full coat of hot asphalt to base sheet and substrate and adhere base sheet to substrate prior to asphalt cooling.
- Apply base sheet flashing in full application of hot asphalt at a rate of 1.2 kg/m² (25 lbs. per square).
- 10. Heat weld exterior 25 mm (1 in.) of all side and end laps providing a 3 mm (1/8 in.) bitumen bleed out. Thoroughly and effectively roll membrane (using manufacturer's recommended steel roller) to attain full contact and adhesion.

Self-Adhesive Applications (Exterior Face)

11. Apply self-adhesive base sheet flashing into primed surfaces and roll into place with adequate pressure to ensure full contact and adhesion with substrate. Membrane must be rolled into place using manufacturer's approved roller.



- 12. Peel back 100 to 150 mm (4 to 6 in.) of the silicone release paper to hold the membrane in place. Gradually peel back remaining silicone release paper, pressing down on membrane with an aluminum applicator to ensure contact and adhesion.
- 13. Heat weld exterior 25 mm (1 in.) of all side and end laps providing a 3 mm (1/8 in.) bitumen bleed out. Thoroughly and effectively roll membrane (using manufacturer's recommended steel roller) to attain full contact and adhesion.

3.16 Reinforcement Gussets

- 1. Apply gussets at every angle, on inside and outside corners in accordance with manufacturer's requirements.
- 2. Install self-adhesive or thermofusible gussets over base sheet flashing and before application of membrane cap sheet flashing.

3.17 Modified Bituminous Membrane Cap Sheet Flashings

- 1. Apply membrane cap sheet flashings in general conformance with details commencing from low point and working up-slope in maximum 1 m (3.25 ft.) wide strips and offset base sheet flashing side laps 50%.
- 2. Membrane sheets with a poly on top face shall have poly burned off prior to applying cap sheet flashings. Maintain minimum 50% stagger from base sheet flashing. Use chalklines to maintain neat and straight lines. Do not walk on or step into newly applied membrane.
- Fully torch modified bituminous cap sheet flashing to attain full bond. Provide 3 mm (1/8 in.) bleed out at all side laps. Maintain minimum 75 mm (3 in.) side and 152 mm (6 in.) end laps. Laps shall be installed to shed water.
- 4. Terminate cap sheet 13 mm (1/2 in.) back from outside edge of parapet blocking and past base sheet flashing 52 mm (2 in) onto flat of roof.
- 5. At wall terminations, install and secure termination bar to adequately restrain the base and cap sheet flashings. Secure termination bar at maximum 305 mm (12 in.) on centre. Apply sealant bead along entire length of termination bar.
- 6. Repair defects in applications with additional piece of torch grade base sheet. Carry out repairs to satisfaction of *Consultant*.

3.18 Drains

- 1. Cut opening through membrane base sheet, insulation, thermal barrier, vapour retarder and centre drain over pipe. Apply mastic on underside of flange.
- 2. Insert drain body into existing or new rain water leader until flange is flush with roof membrane. Secure new drains with mechanical (MJ) connection and underside with deck clamp.
- 3. Note: Overlay board to be completely cut-out under drain flange.



- 4. Flash drain flange with one ply of torch grade base sheet. Extend membrane a minimum of 305 mm (12 in.) beyond the edge of drain flange. New 3-ply glass felt shall be continuous through drain area.
- 5. Install clamping ring, control flow and aluminum strainer over raised bosses and install screws to tighten ring against membrane and flashings until secure.
- 6. Ensure roof drains are clear of debris and free draining at project completion.

3.19 Rainwater Leaders (RWL)

- 1. Provide new rainwater leaders where indicated on drawings. Prior to drilling core holes, use electronic devices (X-ray equipment) to locate conduits.
- 2. Install lines with required slope to effectively drain water and connect to existing rainwater leader with required fittings. Secure to deck and walls with appropriate hangers and brackets.
- 3. Insulate plumbing lines with insulation to provide a continuous thermal barrier. All joints are to be taped. Entire length of rainwater leader shall be insulated, unless otherwise approved by authorities having jurisdiction. Exterior rainwater leaders do not require insulation.
- 4. Provide all required hardware and accessories to complete required installation.
- 5. Conduct water test to ensure rainwater leader and drain connections are watertight.

3.20 Sleeves and Stacks

- 1. Provide all required vents, stacks and conduit sleeves and supports to suit site conditions.
- 2. At existing vent pipes, extend pipe with same material to 25 mm (1 in.) above top edge of sleeve. At existing exhaust stacks, extend pipe as required to allow for rain collar installation.
- 3. Prime stack flanges, top and bottom and set underside of flange in bed of mastic on membrane and position evenly around projection. Flash in flanges with one ply of torch grade base sheet. Extend membrane a minimum of 305 mm (12 in.) beyond the edge of drain flange.
- 4. Where stacks are installed on top of curbs, entire 'boxed curb' shall be covered with adequately secured overlay board and completely covered with torch grade membrane base sheet and cap sheet.

3.21 Guy Wire Anchors

- 1. Remove existing guy wire anchors, if possible, without disturbing structural supports and install new guy wire supports as per Article 3.20 in this section and resecure guy wire.
- 2. If unable to remove existing supports, raise and clean flange and flash-in as per Article 3.20 in this section.



3.22 Goose Necks

- 1. Set Goose Neck flange in adhesive, apply 1-ply torch grade modified membrane base sheet flashing over flange and apply torch grade membrane cap sheet continuously though penetration as noted herein.
- Insulate bottom half of sleeve with mineral fibre and spray foam top half leaving a 25 mm 2. (1 in) gap. Once spray foam has cured, trim to a flush surface and apply pourable sealer for the top 25 mm (1 in.).
- 3. Install the separate cap and mechanically secure to base, carefully fitting cables through end and seal with metal end plate and caulking.

3.23 Parapets/Perimeters/Walls/Sleepers/Curbs

- 1. Butt new insulation to sleepers by neatly cutting perimeter to fit profile of sleeper.
- 2. Provide 2-ply membrane flashings or elastomeric sheeting over all sleepers to fully encapsulate wood and in accordance with this section and as detailed.
- 3. Construct parapet, perimeters, wall and curbs as detailed with new wood members constructed in accordance with Section 06 10 00 - Rough Carpentry.
- 4. Provide metal cap flashings at sleepers and curbs prior to re-installing units.

3.24 Dividers/Movement/Control Joints

- 1. At all roof dividers, movement and control joints, construct as detailed with new wood members and frame in accordance with Section 06 10 00 - Rough Carpentry.
- 2. Provide 2-ply membrane flashings in accordance with this section and as detailed.
- 3. Install metal counter flashing over top/horizontal portion of divider.

3.25 Overflow Scuppers

Existing walls will have to be saw-cut, boxed in with plywood sheathing and 1. membrane base sheet flashing prior to installing scupper. Allow for required rough opening.

2. At high walls and concrete/core slab and Rapidex deck, existing substrate shall be scanned to avoid cutting through any reinforcement.

- Where indicated on drawings, install new scuppers and secure to substrate. Flash in 3. scupper flanges with one-ply of self-adhesive base and one ply torch grade cap sheet.
- 4. Exterior face of scupper shall be covered with metal flashing to match adjacent metal.

3.26 Roof Access Ladders

1. Existing roof access ladders not to remain shall be removed and disposed off site. Existing wall penetrations shall be adequately sealed and metal siding replaced to match, where required.



- 2. Provide new roof access ladder, cage and ladder guard and install in accordance with reviewed shop drawings.
- 3. Exact locations to be verified on site by *Owner* and *Consultant. Contractor* shall be responsible for field measurement.
- 4. All work to be in accordance with governing regulations and Ministry of Labour Guidelines.
- 5. At base and top of ladder, provide minimum two precast pavers on leveled pedestals. At top of ladder, precast pavers shall be set into 'metal trellis', which is laid horizontally on the roof on insulation pads secured to main ladder to prevent any movement, sway or rocking of handrail during use.

3.27 Existing Access Ladders

- 1. Existing roof access ladders not required to remain shall be removed and disposed of appropriately. Existing anchors / plates shall be removed, and holes filled in with either mortar or sealant to match. Openings shall be made watertight.
- 2. Existing ladder(s) to remain shall be modified to suit new perimeter(s) and roof elevations without disturbing structural integrity / securement of ladder and substrate.

3.28 Storm Collars

1. Install storm collars complete with clamping ring and sealant over stacks where caps cannot be installed.

3.29 Electrical/Mechanical and Gas Line Penetrations

- 1. At pipe/conduit penetrations, provide prefabricated pitch-pan system, adhesive and mastic or insulated sleeve. Provide minimum 25 mm (1 in.) gap between penetration and inner face of pitch-pan.
- 2. Clean and seal the base of the penetration top the membrane and extend minimum 25 mm (1 in.) above the pitch-pan.
- 3. Adhere pitch-pan system to roof membrane with a continuous 6 mm (1/4 in.) sealant bead on underside of pitch-pan and all end joints. Embed onto membrane and press in place until sealant overflows from all sides. Apply continuous sealant bead at exterior face of all end joints and at junction of pitch-pan to membrane
- 4. Completely fill pitch-pan with required pourable sealer/mastic, with high point in the middle and sloped to exterior edge to adequately drain moisture over perimeter.

3.30 Sealing All Penetrations

1. Ensure substrate is cleaned of all foreign substances that can impair adhesion. Apply a base coat of liquid waterproofing. Trim reinforcing material to conform to shape of penetrations and fully embed into liquid base coat.



- 2. Apply second coat of liquid membrane fully saturating reinforcement. Apply additional thin coat of liquid membrane and embed coloured granules before it dries.
- 3. Note: This application is required at all penetrations prior to application of the pitch-pan.

3.31 Pitch – Pans (If Approved by Consultant)

- 1. New pitch-pan pockets are to be provided at penetrations where specified sleeves are not suitable. All surfaces shall be clean dry and free from all deleterious material. Galvanized metal penetrations and painted metal must be prepared using a grinding machine to bare metal. PVC pipe must be sanded with sandpaper.
- 2. All metal surfaces and the pitch-pan pocket must be cleaned with non-greasy solvent such as acetone or Methyl Ethyl Ketone (MEK). Place pitch-pan pocket at desired location and mark outside edge for reference. Pitch pocket shall be placed with minimum 25 mm (1 in) clearance from inside of pitch pocket and penetration.
- 3. Seal base of penetration with Liquid Flashings as per Paragraph **3.27 Sealing All Penetrations in this section.**
- 4. Position pitch-pan pocket and apply a liberal bead of sealant at outside perimeter of pitch pocket. Use the tip of a trowel to adhere sealant to the membrane. Dispense an initial amount of mastic (equivalent to half of the nozzle), outside of the pitch pocket, to assure a homogeneous mixture of parts A and B.
- 5. Fill assembled pitch pocket with mastic until full, with a high point at middle and tapered to outside edge to allow for water flow over pitch-pocket.

3.32 Asphalt Floodcoat and Aggregate Surfacing

- 1. Completed roof membrane and flashing system shall be reviewed by manufacturer providing warranty prior to application of gravel surfacing. Carry out required remedial work as required by manufacturer. *Contractor* shall be responsible for notifying manufacturer and manufacturer shall provide liter of acceptance to *Consultant*.
- 2. Allow minimum of 12 hours and maximum five (5) days for roof membrane to solidify before application of gravel pour.
- 3. Over completed roof membrane, apply flood coat of hot asphalt at a rate of 3.0 kg/m² (60 lbs./100 ft²) and while hot embed 20 kg/m² (400 lbs. /100 ft²) of gravel. Broom back loose gravel and apply second pour of bitumen at rate of 2.5 kg/m2 (50 lbs./100 ft²) and gravel at rate of 15 kg/m2 (300 lbs./100 ft²) of gravel for minimum of 3000 mm (10 ft.) each way at corners and around perimeters for 1220 mm (4 ft.).
- 4. Evenly distribute aggregate and ensure bond with flood coat. Extend aggregate to bottom edge of cant strips.

3.33 Precast Pavers

1. Install new precast paver to required layout. Saw cut to fit at corners/walls or core hole where required to fit penetrations and field dimensions. No piece shall be smaller than



152 mm (6 in.) x 610 mm (2 ft.). Maintain continuous drainage under all pavers.

2. Set pavers on pedestals and adequately balance pavers so that 'rocking' does not occur. Pedestal shall be minimum 152 mm (6 in.) wide by 305 mm (12 in.) long.

3.34 Existing Mechanical & Electrical Supports

1. Newer installed mechanical/electrical supports shall be temporarily moved, protected from work and re-installed with required modifications. Existing services shall be adequately supported during this work.

3.35 Gas line Painting

1. Gas lines are to be cleaned of all deleterious materials and painted with two coats of yellow paint. Prime coat minimum 1.5 mil (.04 mm) dry thickness. Top coat minimum 2 mil (.05 mm) dry film thickness.

3.36 Gas Line, Mechanical Pipe and Conduit Supports

- 1. Provide new gas line, mechanical pipe and conduit supports and pads to spacing indicated and in accordance with Shop Drawings and CSA B149.1.
- 2. Provide required modified bituminous membrane cap sheet pad, minimum 450 x 450 mm (16 x 16 in.), under manufacturer pad support.
- 3. Submit certification from design Engineer that supports have been installed in accordance with authorities having jurisdiction.

3.37 Mechanical Equipment

- 1. *Contractor* shall be responsible to remove and re-install roof mounted mechanical equipment and services necessary to facilitate application of new roof system. This includes temporary removal and replacement of all associated ductwork. Do not disconnect H.V.A.C. without approval of *Owner*.
- 2. Mechanical pipes and gas lines must be disconnected and sufficiently supported. Use treated wood blocks located on concrete pavers resting on top of pedestals to temporarily support equipment. During roof replacement operations, all H.V.A.C. ducts are to be adequately supported.
- 3. Temporary removal of gas piping is responsibility of *Contractor* and shall be re-installed in accordance with applicable regulations and authorities having jurisdiction. Installation of gas line and connections shall be tested and certified by Gas Piping Fitter and Gas Technician, employed by a *Contractor* licensed by the Technical Standards and Safety Act (TSSA), Ontario Regulation 215/01. Documentation shall be submitted as part of Close-Out Documents.
- 4. *Contractor* shall provide for adjustments to ducting, duct supports and piping to suit new roof elevations and new mesh and mastic repairs to match existing duct coatings. At wall junctions, ductwork shall be sealed with transition membranes secured to wall with termination bar/metal flashings and provide watertight junction.



- 5. At wall junctions, ductwork is to be sealed with transition membranes that are secured to wall with termination bar or metal flashings and provide a watertight junction.
- 6. Submit certificate from licensed mechanical contractor stating all modifications and connections comply with Building Automation System and fully functional.
- 7. *Contractor* shall be responsible for Building Automation System (BAS) and may retain mechanical/electrical services contractor from *Owner* to ensure system is adequately disconnected, connected and functioning properly.

3.38 Electrical Equipment

- 1. *Contractor* shall disconnect all wiring and junction boxes required to facilitate installation of new roof system. Prior to disconnecting electrical systems, obtain approval from *Consultant* or *Owner*. Provide minimum 48 hours' notice for clearance.
- 2. Submit certificate from licensed electrical contractor stating all modifications and connections comply with the Electrical Safety Authority (ESA).

3.39 Commissioning

- 1. HVAC commissioning shall be carried out assuring that all systems and components designed, installed, tested, operated, verified and maintained according to operational requirements of HVAC system and to *Owner* satisfaction.
- 2. *Contractor* shall submit signed and certified checklist from 'certified and qualified mechanical contractor' stating that HVAC system meets or exceeds required functioning requirements.
- 3. Verify that operation of control system conforms to that specified in sequence of operation. All systems shall be adequately balanced. Provide required clearance certificates from electrical and mechanical authorities having jurisdiction.

3.40 Quality Control

- 1. Owner may retain an independent Consultant to carry out periodic supervision during construction. If requested by Consultant, take cut-test samples of roofing membrane and membrane flashings, wrap and label samples, identify locations and submit to Consultant for review and testing.
- Contractor shall make an allowance for minimum of one cut test per day and all required patching to match existing assembly. Samples must be a minimum 305 x 305 mm (12 x 12 in.) and include all new roof components including asphalt pour and gravel. Failed test results will require remedial work acceptable to Consultant and may entail complete removal and replacement of failed areas.

3.41 Clean-up

1. Remove all excess materials, debris, tools and equipment as work proceeds and on completion, or sooner if requested by *Consultant*. Remove all stains, asphalt, caulking or other adhesive from all surfaces.

End Of Section 07 51 13



1. GENERAL

1.1 Section Includes

1. Section includes for provision of all labour, materials, equipment and services for Sheet Metal Flashing and Trim in accordance with Contract Documents.

1.2 Related Sections

- 1. Section 01 10 00 General Instructions
- 2. Section 01 11 00 Summary of Work
- 3. Section 21 41 19 Selective Structure Demolition
- 4. Section 06 10 00 Rough Carpentry
- 5. Section 07 51 13 Built-Up Asphalt Roofing
- 6. Section 07 92 00 Joint Sealers

1.3 References

- 1. ASTM A 525M, Standard Specification for Sheet Steel, Zinc Coated (Galvanized) by the Hot Dipped Process, General Requirements.
- 2. Canadian Sheet Steel Building Institute (CSSBI) Bulletin No. 9, Core and Maintenance of Pre-finished Sheet Steel Building Products.

1.4 Operations

1. Perform operations, at times designated by Halton District School Board, that will not adversely affect occupants of building and operations in and around site access and egress.

1.5 Protection

1. Protect work of this section from damage. Damaged work which cannot be satisfactorily repaired, restored or cleaned, shall be replaced at no cost to Halton District School Board.

1.6 Submittals

1. Submit samples of flashing and sheet metal type and colour to *Consultant* and Halton District School Board for review prior to commencing work.

1.7 Mock-Up

- 1. Fabricate mock-ups in minimum 2440 mm (8 ft.) lengths with reviewed materials, approved methods including, joints, seams, expansion joints, starter strips and fasteners.
- 2. Mock-up, if accepted, shall represent the minimum standard for work. Mock-up may be included as part of final work



1.8 Quality Assurance

1. Flashing and Sheet Metal Work shall be executed in accordance with SMACNA Architectural Sheet Metal Manual - 1993 (Addendum No. 1 – October 31, 1997), by skilled trades having a minimum of five (5) years related experience.

1.9 Warranty

- 1. Provide minimum two (2) year Warranty from date of Substantial Performance, as certified by *Consultant*. Warranty shall be submitted against defects in workmanship and materials. Provide all additional Warranties that may be available from manufacturer.
- 2. Contractor must extend the Warranty on replaced parts and workmanship for a period of two (2) years from date of acceptance of replacement parts and workmanship. Defects will include but will not be limited to leaking, failure to stay in place, lifting, deformation and breaking of weathertight seals.

2. PRODUCTS

2.1 Material

- 1. Prefinished steel sheet: Galvanized steel, 0.71 mm (24 gauge) core nominal thickness, conforming to ASTM A525, Z275 zinc coated (galvanized) to designation G90 by the hot dip process, with a prefinished coat. Profiles as detailed.
- 2. Precoat Finish: Perspectra Plus Series, factory applied coating. Colour to be approved by Halton District School Board from standard colours listed in General Colour Card.
- 3. Starter strips: Fabricated from prefinished steel sheet, 0.87 mm (22 gauge) core nominal thickness. Minimum 75 mm (3 in.) wide face or as detailed and to be continuous.
- 4. Termination Bar: 3 mm x 25 mm (1/8 in. x 1 in.) extruded aluminum bar.
- 5. Fasteners: In accordance with Section 06 10 00 Rough Carpentry
- 6. Touch-up paint: As supplied and recommended by sheet steel manufacturer.
- Exposed Sheet Metal Fasteners: #14 AB x 11 mm (7/16 in.) Self-Drilling Hex Head cadmium plated carbon steel, complete with washer and colour coded cap, minimum 38 mm (1-1/2 in.) long.
- 8. Cap, Counter and Fascia Metal to be fabricated to layouts and details shown on drawings and to extent required.
- 9. Overflow Scuppers: Overflow (Where Shown on Drawings): Fabricated from 0.71 mm (24 gauge) stainless steel. To be a minimum 200 mm wide x 100 mm high (8 x 4 in.) with continuously soldered seams with a 150 mm (6 in.) wide apron/flanges.
- 10. Expansion Joint Metal: Fabricated from prefinished steel sheet, with a 'V-Break' at the joint with 75mm (3 in,) hemmed flanges.
- 11. Sealants: In accordance with Section 07 92 00 Joint Sealers



3. EXECUTION

2.1 Fabrication

- 1. Shop fabricate flashing, sheet metal and trim in accordance with requirements of SMACNA and the Contract Documents. Form sheet metal on bending brake, shaping, trimming and hand seaming on bench.
- 2. Form sections square, true, and accurate to size. Flashings shall be free from distortion, oil canning, twists, buckles, discolouration and other defects detrimental to appearance and performance.
- 3. Double back all edges a minimum of 13 mm (1/2 in.).
- 4. Form joints with S-locks and make allowances for movement. Mitre and form standing seams at all corners. Make allowance for movement at joints.
- 5. Fabricate cap flashings, counter flashings and starter strips to details shown and where required.
- 6. Fabricate metal in 2400 mm (8 ft.) maximum lengths with an unbroken face less than 225 mm (9 in.). Form flashings with an exposed unbroken face exceeding 225 mm (9 in.) and a girth greater than 610 mm (24 in.) in 1220 mm (4 ft.) maximum lengths.

7. Provide horizontal stiffening rib "V" on all face metal exceeding 225 mm (9 in.) in girth and where shown on drawings.

- 8. Provide an 'S-Lock' joint at all end joints and at all horizontal joints between the cap flashing and the vertical flashing and between the vertical flashing and base counter flashing.
- 9. Where soldered joints are absolutely necessary and where approved for use in prepainted metal, clean paint off both surfaces before soldering for minimum area necessary.
- 10. Sheet metal coming in contact with a metal of a different type must be back painted with two (2) coats of isolation coating.

2.2 Sheet Metal Flashing and Trim

- 1. Provide a continuous starter strip for all metal cap and counter flashings and gravel stops secured at a maximum 405 mm (16 in.) on centre.
- 2. Install flashings and sheet metal that includes but not limited to; cap flashings, counter flashings, curb and sleeper counter flashings, starter strips and other miscellaneous trim work in accordance with Contract Documents.
- 3. Parapet and perimeter cap flashings shall be installed with a <u>minimum 5% positive slope</u> to interior of roof. Slope to be provided by installation of continuous wood shims, plywood and wood blockings as detailed and in accordance with Section 06 10 00 Rough Carpentry.



- 4. Saw cut new reglet or re-use existing (where approved by *Consultant*), into masonry surfaces to accommodate installation of sheet metal flashings. Reglet is to be a minimum 19 mm wide x 25 mm deep (3/4 in. x 1 in.).
- 5. Install sheet metal work with concealed fasteners. Install exposed fasteners only when and where permitted by *Consultant*. Install fasteners in an approved manner as to prevent water penetration at point of fastening and to be evenly and neatly distributed. Provide fasteners with washers.
- 6. At reglets, return top edge of flashings into reglet 25 mm (1 in.). Secure flashings with pin grips spaced at maximum 405 mm (16 in.) on centre and apply sealant bead to shed water.
- 7. Provide continuous termination bar at top edge of membrane flashings. Fasten termination bar to substrate at a maximum 305 mm (12 in.) on centre with appropriate fasteners.
- 8. Fasteners are to be located a minimum of 305 mm (12 in.) above the roof membrane where possible.
- 9. End joints of adjacent lengths shall be completed using 'S-Lock' joints. This shall be accomplished by inserting the end of one length in a 25 mm (1 in.) deep "S" lock formed in the end of the adjacent length. Concealed portion of the "S" lock shall extend 25 mm (1 in.) outwards and shall be nailed to substrate.
- 10. Top edge of counter flashing shall be inserted under cap flashings.
- 11. Provide two exposed fasteners on interior side of cap flashing, evenly spaced per 2400 mm (8 ft.) length

2.3 Overflow Scuppers

- 1. Where indicated on drawings, install new scuppers and secure to substrate.
- 2. Overflow scuppers shall be set no higher than 38 mm (1-1/2 in.) above lowest point of roof area.
- 3. Flash in scupper flanges in accordance with Section 07 52 16 SBS Modified Bituminous Membrane Roofing

2.4 Clean-up

1. Remove all excess materials, debris, tools and equipment as work proceeds and on completion, or sooner if requested b *Consultant*.



1. GENERAL

1.1 Section Includes

- 1. Section includes for provision of all labour, materials, equipment and services for Joint Sealers in accordance with Contract Documents.
- 2. Section also includes for removal and replacement of masonry control joints of Area 4.0, 14 locations at approximately 2440 mm (8 ft.) high each.

1.2 Related Sections

- 1. Section 01 10 00 General Instructions
- 2. Section 01 11 00 Summary of Work
- 3. Section 21 41 19 Selective Structure Demolition
- 4. Section 06 10 00 Rough Carpentry
- 5. Section 07 51 13 Built-Up Asphalt Roofing
- 6. Section 07 62 00 Sheet Metal Flashing and Trim

1.3 References

- 1. Sealants acceptable for use on this project must be listed on CGSB Qualified Products List issued by CGSB Qualifications Board for Joint Sealant.
- 2. CAN/CGSB-19.24 Multi-Component, chemical curing sealing compound.
- 3. CAN/CGSB-19.13 Single Component, elastomeric, chemical curing sealing compound.
- 4. CGSB 19-GP-14 Sealing Compound, One-Component, Butyl-Polyisobutylene Polymer Base, Solvent Curing.

1.4 Operations

1. Perform operations, at times designated by Halton District School Board, that will not adversely affect occupants of building and operations in and around site access and egress.

1.5 Protection

1. Protect work of this section from damage. Damaged work which cannot be satisfactorily repaired, restored or cleaned, shall be replaced at no cost to Halton District School Board.

1.6 Submittals

1. Submit samples of sealant type and colour to *Consultant* and Halton District School Board for review prior to commencing work.



1.7 Quality Assurance

1. Skilled trades with minimum five years related experience shall execute Work.

1.8 Mock-Up

1. Construct mock-up to show location, size, shape and depth of joints complete with backup material, primer, sealant and tooling. Mock-up may be included as part of finished work.

1.9 Warranty

- 1. Provide minimum two (2) year Warranty from date of Substantial Performance, as certified by *Consultant*. Guarantee shall be submitted against defects in workmanship and materials.
- Contractor shall extend Warranty on replaced parts and workmanship for a period of two (2) years from date of acceptance of replacement parts and workmanship. Defects will include but will not be limited to; joint leakage, hardening, cracking, crumbling, melting, bubbling, shrinkage, running, sagging, change of colour, loss of adhesion, loss of cohesion and staining of adjoining or adjacent materials on surfaces.
- 3. Provide all additional Warranties that may be available from manufacturer.

1.10 Environmental Requirements

- 1. Conform to manufacturer's recommended temperatures, relative humidity and substrate moisture content for application and curing of sealants.
- Materials must be stored at minimum of 20°C (68°F) immediately prior to application. Sealant applications must be carried out when ambient temperature is above 0°C (32°F).

2. PRODUCTS

2.1 Material

- 1. All materials in a sealant system shall be compatible with each other and with substrate.
- 2. Colour(s) of sealants shall be selected to match adjacent substrate and shall be approved by *Consultant* or Halton District School Board.
- 3. Elastomeric Sealants: One part elastomeric, non-sag urethane based sealant, for masonry to masonry, masonry to metal junctions. Acceptable Material:
 - 1. Dymonic as manufactured by Tremco Incorporated.
 - 2. Precast Wall (Vertical Joints) Three-component, chemically curing, epoxidized polyurethane sealant, 'Dymeric 240' by Tremco Incorporated.



- 4. Silicone sealants: Silicone based sealant, for metal to metal junctions. Acceptable Material:
 - 1. Spectrum 2 as manufactured by Tremco Incorporated.
 - 2. Dow Corning 999-A Silicone Building & Glazing Sealant by Dow Corning Canada Inc.
- 5. Butyl sealants: Butyl rubber and polyisobutylene blend sealant. Butyl sealant to be compatible with modified bituminous membrane flashings. Acceptable Material:
 - 1. Tremco Butyl Sealant as manufactured by Tremco Incorporated.
 - 2. Modified Membrane manufacturer's approved sealant.
- 6. Joint Backing: Polyethylene, urethane, neoprene or vinyl, extruded foam recommended by the sealant manufacturer. Circular shape with diameter 25% greater than joint width before installation.
- 7. Void Filler: Glass fibre insulation with a nominal density of 14 kg/m³ (Sized for 25% compression).
- 8. Primer: As recommended by sealant manufacturer to assure adhesion of compound and to prevent staining of substrate materials.
- 9. Joint Cleaner: Non-corrosive and non-staining type, compatible with joint forming materials and sealant as recommended by sealant manufacturer.
- 10. Bond Breaker Tape: Polyethylene bond breaker tape, which will not bond to sealant.

3. EXECUTION

3.1 Removal of Exiting Sealants

- 1. Remove existing sealants, backing material, dust, oil, grease, oxidation, millscale, coatings and all other loose material by cutting, brushing, scrubbing, scraping and grinding.
- 2. Rake out joints, cracks and crevices to receive sealant, to a depth measuring half the joint width. Clean out existing reglets to satisfaction of *Consultant*.

3.2 Preparation

- 1. Examine joint sizes and conditions to establish correct depth to width ratio for joint backing and sealant. Clean joint surfaces of deleterious material and substances including dust, rust, oil grease, and other matter that may impair work.
- 2. Ensure joint surfaces are dry and frost free. Prepare substrate as recommended by sealant manufacturer ensuring adjacent surfaces are not damaged.
- 3. Commencement of Work implies acceptance of existing conditions and assuming full responsibility for finished condition of the Work.



3.3 Priming

- 1. 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 Sealant Application

1. Install joint backing all joints prior to applying sealants. Diameter of backing material shall be 25% more than width of joint.

2. Maintain minimum 2:1 width to depth ratio for sealant.

- 3. Apply bond breaker tape where joints are of insufficient size to install joint backing or at 90° junctions or where required by sealant manufacturer or *Consultant*. Ensure bond surface area meets the minimum required size recommended by sealant manufacturer.
- 4. Apply sealant in continuous beads, in solid contact to underlying surfaces with sufficient pressure to fill voids and joints solid.
- 5. Form surface of sealant with full bead, smooth, free from ridges, wrinkles, sags, air pockets and embedded impurities. Superficial skin bead is not acceptable.
- 6. Tool exposed surfaces before skinning occurs to attain concave shape using approved tools.
- 7. Cure sealant in accordance with the manufacturer's requirements. Do not cover up sealants until proper curing has taken place.

3.5 Clean-up

- 1. Clean adjacent surfaces immediately and leave work neat and clean.
- 2. Remove excess and droppings using recommended cleaners as work progresses.
- 3. Remove bonding tape after initial set of sealant.
- 4. Remove all excess material, debris, tools and equipment as work proceeds and on completion, or sooner if requested by *Consultant*.





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GENERAL NOTES

- 1. THE ELECTRICAL CONTRACTOR SHALL NOTE THAT THE EXISTING BUILDING WILL REMAIN IN OPERATION THROUGHOUT DEMOLITION/CONSTRUCTION. ALLOW FOR ANY WORK REQUIRED TO BE DONE WHICH MAY AFFECT POWER SUPPLY AND OPERATION OF THE BUILDING TO BE CARRIED OUT AFTER HOURS OR AT A TIME CONVENIENT TO THE OWNER. PROVIDE TEMPORARY SERVICES AS REQUIRED TO ENSURE CONTINUED OPERATION AT ALL TIMES.
- 2. CAREFULLY EXAMINE ALL EXISTING UTILITY LINES SUCH AS GAS, WATER ETC. PRIOR TO START THE ELECTRICAL CONSTRUCTION WORKS AND COORDINATE WITH OTHER TRADES AND REPORT OF ANY DISCREPANCY PRIOR TO PROCEEDING.
- 3. THESE DRAWINGS SHALL BE READ & PRICED IN CONJUNCTION WITH ARCHITECTURAL, MECHANICAL, AND STRUCTURAL DRAWINGS AND SPECIFICATIONS (AS APPLICABLE) AS WELL AS ALL OTHER DOCUMENTS FORMING THIS BID. INCLUDE FOR THE SUPPLY AND INSTALLATION OF POWER, SYSTEMS, AND LIGHTING AS PER THE COMPLETE CONSTRUCTION DOCUMENTS. NO EXTRA COST WILL BE ACCEPTED IN FAILURE TO OBTAINING AND/OR REVIEW OF SUCH DOCUMENTS. REFER TO ARCHITECTURAL AND ELECTRICAL LAYOUTS IN CONJUNCTION FOR EXACT LOCATION OF ALL EQUIPMENT. REPORT ANY DISCREPANCIES TO THE ELECTRICAL ENGINEER PRIOR TO COMMENCING WORK. NO EXTRA WILL BE PROVIDED AS A RESULT OF A FAILURE TO DO SO.
- 4. IT IS MANDATORY THAT ELECTRICAL WORK CONFORM TO ALL APPLICABLE CODES (INCLUDING THE ONTARIO BUILDING, FIRE, AND ONTARIO ELECTRICAL SAFETY CODE), BASE BUILDING (BOARD) STANDARDS, AND THE STANDARDS SET BY ANY AND ALL LOCAL AUTHORITIES HAVING JURISDICTION.
- 5. ALL ELECTRICAL WORK SHALL BE INSPECTED BY THE ELECTRICAL SAFETY AUTHORITY (ESA). ARRANGE AND PAY FOR ALL INSPECTIONS REQUIRED FOR THE DURATION OF THE PROJECT.
- 6. DURING CONSTRUCTION, IT IS CRITICAL THAT THE ELECTRICAL CONTRACTOR COORDINATES ITS WORK WITH ALL OTHER TRADES. THE ELECTRICAL CONTRACTOR IS RESPONSIBLE FOR REVIEWING THE SCOPE OF WORK OF OTHER TRADES (INCLUDING, BUT NOT LIMITED TO, ARCHITECTURAL, MECHANICAL, STRUCTURAL, MILLWORK, ETC.) IN CONJUNCTION WITH THE PROPOSED ELECTRICAL SCOPE OF WORK. NO EXTRA WILL BE PERMITTED OF AN ERROR RELATED TO A LACK OF COORDINATION ON SITE.
- 7. THE ELECTRICAL CONTRACTOR SHALL LABEL ALL NEW AND EXISTING LIGHT SWITCHES, RECEPTACLES AND JUNCTION BOXES COVERPLATES WITH THE PANEL NAME AND BREAKER IT IS FED FROM. ALL LABELING OF ELECTRICAL DEVICES SHALL BE DONE SO WITH A LABELMAKER ONLY. NO HAND WRITTEN LABELS WILL BE PERMITTED.
- 8. WHERE NEW PARTITIONS ARE BEING CONSTRUCTED, ALL WIRING AND RACEWAYS SHALL BE EMBEDDED IN THE CONSTRUCTION OF THE NEW WALLS AND ALL BACKBOXES SHALL BE RECESSED. WHERE NEW DEVICES/SYSTEMS ARE PROPOSED ON EXISTING BLOCK WALLS, UTILIZE WIREMOLD 500/700 SERIES AS RACEWAY FOR ALL NEW WIRING. PROVIDE WIREMOLD BACKBOXES FOR SURFACE MOUNTED, INTERIOR APPLICATIONS. THE USE OF SHEET METAL BOXES WILL NOT BE PERMITTED.
- 9. IN THE EVENT OF ANY DISCREPANCY BETWEEN THE ELECTRICAL DRAWINGS AND SPECIFICATIONS, ALLOW FOR THE HIGHEST-PRICED OPTION IN THE TENDER PRICE.
- 10. ALL WIRING USED ON THIS PROJECT SHALL BE RUN IN RACEWAYS. NO USE OF ARMOURED (BX) CABLE WILL BE PERMITTED WITH THE EXCEPTION OF RUNS NOT TO EXCEED 5' BETWEEN THE FINAL CONNECTION AND THE RESPECTIVE JUNCTION BOX.
- 11. NEW WORK SHALL NOT COMMENCE PRIOR TO COMPLETION OF DEMOLITION BY ALL TRADES. THE INSTALLATION OF NEW SYSTEMS (INCLUDING CONDUIT) SHALL TAKE PLACE IN STRICT COORDINATION WITH OTHER DISCIPLINES TO AVOID CONFLICTS. ANY WORK REQUIRING REMOVAL AND REINSTATEMENT SHALL BE DONE AT NO COST TO THE OWNER WHEN SUCH CHANGES ARE REQUIRED AS A RESULT OF SITE COORDINATION ISSUES.

DRAWING LIST					
DRAWING NUMBER	DESCRIPTION				
E1	ELECTRICAL LEGEND, NOTES AND KEY PLAN				
E2	EXISTING & NEW ELECTRICAL PLANS				



1 FIRST FLOOR KEY PLAN E1 SCALE: N.T.S.

Halton District School Board					
ELECTRICAL CONSULTANT: SURI & ASSOCIATES LTD. ENGINEERING CONSULTANTS					
1022 WHITE CLOVER WAY MISSISSAUGA, ONTARIO L5V 1C8 T (905)-290-7861 F (289)-327-3420 ELECTRICAL MECHANICAL LIGHTING COMMUNICATION F (289)-327-3420					
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AND MUST REPORT ANY DISCREPANCIES TO THE ARCHITECTS BEFORE PROCEEDING WITH THE WORK. THE USE OF THIS DRAWING OR PART THEREOF IS FORBIDDEN WITHOUT THE WRITTEN APPROVAL OF THE ARCHITECTS.					
PROFESSIONAZ PROFESSIONAZ CONTIV CALL S. SURI BO Feb. 26/21 PO NTH					
JOHN T. TUCK PUBLIC SCHOOL CEILING & LIGHTING REPLACEMENT 3365 SPRUCE AVE, BURLINGTON, ON L7N 1J7					
ELECTRICAL LEGEND, NOTES AND KEY PLAN					
ARCHITECTS					
28 KING STREET EAST, UNIT B STONEY CREEK, ONTARIO, L8G 1J8 Tel. 905-664-8735 Fax. 905-664-8737 Web: www.2gai.com SCALE: AS NOTED PROJECT:					
FEB 2021 DRAWN R.S. CHECKED S.S. DRAWING E1					



 $\begin{array}{c|c} 1 & \text{EXISTING ELECTRICAL PLAN} \\ \hline E2 & \text{SCALE: } 1/8" = 1'-0" \end{array}$

2 NEW ELECTRICAL PLAN E2 SCALE: 1/8" = 1'-0"

- DRAWING NOTES:
- (1) TEMPORARILY REMOVE THE EXISTING EXIT SIGNS AND REMOTE HEADS AS REQUIRED TO FACILITATE REPLACEMENT OF THE EXISTING CEILING. PULL BACK WIRING/RACEWAYS/ELECTRICAL BOXES AS REQUIRED AND MAKE SAFE. REINSTATE ALL DEVICES C/W WIRING/RACEWAYS/ ELECTRICAL BOXES AT THEIR ORIGINAL LOCATIONS AND ORIENTATIONS UPON INSTALLATION OF THE NEW CEILING. TEST AND VERIFY THAT ALL EMERGENCY LIGHTING OPERATES AS INTENDED AND FOR A PERIOD OF THIRTY (30) CONTINUOUS MINUTES UPON POWER FAILURE.
- 2 TEMPORARILY REMOVE THE EXISTING P.A. SPEAKERS AND CCTV CAMERA AS REQUIRED TO FACILITATE REPLACEMENT OF THE EXISTING CEILING. PULL BACK WIRING/RACEWAYS/ELECTRICAL BOXES AS REQUIRED AND MAKE SAFE. REINSTATE ALL DEVICES C/W WIRING/RACEWAYS/ ELECTRICAL BOXES AT THEIR ORIGINAL LOCATIONS AND ORIENTATIONS UPON INSTALLATION OF THE NEW CEILING.
- 3 TEMPORARILY REMOVE THE EXISTING SMOKE DETECTORS AS REQUIRED TO FACILITATE REPLACEMENT OF THE EXISTING CEILING. PULL BACK WIRING/RACEWAYS/ELECTRICAL BOXES AS REQUIRED AND MAKE SAFE. REINSTATE ALL DEVICES C/W WIRING/RACEWAYS/ELECTRICAL BOXES AT THEIR ORIGINAL LOCATIONS AND ORIENTATIONS UPON INSTALLATION OF THE NEW CEILING. VERIFY DEVICE UPON INSTALLATION AS PER CAN/ULC-S537. THE EXISTING FIRE ALARM SYSTEM IS OF SIMPLEX 4007 MAKE AND MODEL.
- 4 REMOVE THE EXISTING RECESSED LIGHT FIXTURES C/W WIRING BACK TO THE NEAREST JUNCTION BOX. REMOVE ALL EXISTING FIXTURE SUPPORTS. DISPOSE OF ALL FIXTURES AND LAMPS OFF SITE AS PER REGULATORY REQUIREMENTS. THE TROFFER IS TO BE REPLACED WITH NEW AS SCHEDULED.
- 5 REMOVE THE EXISTING RECESSED DOWNLIGHT C/W ALL REDUNDANT WIRING. REMOVE ALL EXISTING FIXTURE SUPPORTS. DISPOSE OF ALL FIXTURES AND LAMPS OFF SITE AS PER REGULATORY REQUIREMENTS. PATCH AND MAKE GOOD THE EXISTING CEILING.
- 6 REMOVE THE EXISTING RECESSED TROFFER C/W WIRING BACK TO THE NEAREST JUNCTION BOX. REMOVE ALL EXISTING FIXTURE SUPPORTS. DISPOSE OF ALL FIXTURES AND LAMPS OFF SITE AS PER REGULATORY REQUIREMENTS. THE TROFFER IS TO BE REPLACED WITH NEW AS SCHEDULED.
- (7) REMOVE THE EXISTING SUSPENDED HIGH-BAY LIGHT FIXTURE C/W WIRING/CONDUIT UP TO PANEL 'LP-A'. REMOVE ALL EXISTING FIXTURE SUPPORTS. DISPOSE OF ALL FIXTURES AND LAMPS OFF SITE AS PER REGULATORY REQUIREMENTS. THE LIGHT FIXTURE IS TO BE REPLACED WITH NEW AS SCHEDULED.
- 8 PROVIDE A NEW 2'X4' RECESSED LED TROFFER AS SCHEDULED. RECONNECT TO THE EXISTING SWITCHED, CORRIDOR LIGHTING CIRCUIT. SEE FIXTURE SCHEDULE FOR DETAILS.
- (9) PROVIDE A NEW 1'X4' RECESSED LED TROFFER AS SCHEDULED. RECONNECT TO THE EXISTING SWITCHED, LIGHTING CIRCUIT SERVING THE OLD TROFFERS. SEE FIXTURE SCHEDULE FOR DETAILS. PATCH AND MAKE GOOD CEILING AS REQUIRED TO FACILITATE THE REPLACEMENT AND NEW FIXTURE COUNT.

GYM

STORAGE

110

- 10 PROVIDE A NEW SUSPENDED LED HIGH-BAY LIGHT FIXTURE AS SCHEDULED. CONNECT TO THE EXISTING LIGHTING CIRCUITS SERVING THE GYM; SEE NOTE #15. PAINT ALL NEW CONDUIT TO MATCH THE EXISTING SURFACE COLOUR.
- (11) PROVIDE SIX (6) NEW LINE-VOLTAGE KEY SWITCHES C/W STAINLESS STEEL COVERPLATES TO CONTROL THE SIX (6) ROWS OF LIGHTING AS SHOWN. VERIFY EXACT LOCATION OF THE SWITCHES WITH THE GYM TEACHER PRIOR TO COMMENCING ROUGH-IN. PROVIDE SIX (6) SET OF KEYS TO THE CARETAKER. NOTE THAT THE EXISTING GYM LIGHTING IS ONLY SWITCHED ON/OFF FROM THE BREAKER AND NO EXISTING SWITCHES EXIST. INCLUDE FOR ALL NECESSARY WIRING/CONDUIT REQUIRED TO FACILITATE THE NEW SWITCHES.
- (12) INCLUDE FOR RE-LAMPING OF THE EXISTING HOUSE LIGHTS WITH NEW LED PAR38 LAMP OF 2000 LUMENS EACH, 3000K, DIMMABLE. PRIOR TO SUBMISSION OF SHOP DRAWINGS AND ORDERING, THE CONTRACTOR SHALL SITE VERIFY THE TYPE OF LAMPS THAT EXIST CURRENTLY AND THE RESPECTIVE LUMEN OUTPUT OF THE LAMPS.
- (13) REPLACE THE EXISTING LINE-VOLTAGE TOGGLE SWITCHES (ON/OFF) SERVING THE EXISTING HOUSE LIGHTS WITH NEW LINE-VOLTAGE DIMMERS. VERIFY CORRECT OPERATION WITH THE LAMP MANUFACTURER PRIOR TO ORDERING.
- 14 IN THE EXISTING CORRIDORS WHERE THE CEILING IS BEING REPLACED WITH NEW, INCLUDE FOR THE INSTALLATION OF NEW J-HOOKS ON BOTH SIDES OF THE CORRIDOR AT 4' ON CENTERS DISTANCE TO SUPPORT ALL EXISTING UNSUPPORTED OR INADEQUATELY SUPPORTED LOW-VOLTAGE CABLING. INCLUDE FOR PROPER SUPPORT OF ALL EXISTING UNSUPPORTED OR INADEQUATELY SUPPORTED LOW-VOLTAGE CABLING AND 120V WIRING FROM THE BUILDING STRUCTURE OR WALL AS NECESSARY TO PREVENT ANY CABLING/WIRING FROM SITTING ON THE NEW CEILING.
- (15) REUSE THE EXISTING SIX (6) CIRCUITS IN THE ELECTRICAL PANEL 'LP-A' TO SERVE THE NEW HIGH-BAY GYMNASIUM (108) LIGHTING. CONNECT EACH ROW OF LIGHT (DEFINED BY ON ONE SWITCH) TO A DEDICATED CIRCUIT. ROUTE CONDUIT FROM THE ELECTRICAL PANEL THROUGH CORRIDOR (101) FOLLOWED BY CORRIDOR (102). CUT, PATCH AND MAKE GOOD THE PATCH OF PLASTER CEILING IN THE CORRIDOR LEADING TO THE GYM AS NECESSARY TO SUIT THE NEW CONDUIT WORK. ALL NEW CONDUIT SHALL BE INSTALLED ABOVE THE DROP CEILING. ALL CONDUITS INSTALLED IN THE GYMNASIUM MUST BE INSTALLED AT A HEIGHT OF 10' OR HIGHER.
- (16) PROVIDE NEW LOW-VOLTAGE OCCUPANCY SENSORS AS SHOWN; EACH SENSOR SHALL BE C/W WIREGUARD. IN GYM (121) ALL SENSORS SHALL CONTROL ALL THE LIGHTS IN THE GYM. IN GYM (118), FOUR (4) SENSORS SHALL CONTROL THE LIGHTS IN ONE HALF OF THE GYM AND THE OTHER FOUR (4) SENSORS SHALL CONTROL THE LIGHTS IN ONE HALF OF THE GYM. PROVIDE TWELVE POWER PACKS IN TOTAL C/W ALL LOW-VOLTAGE WIRING IN CONDUIT REQUIRED FOR COMPLETE OPERATION. IN GYM (121), THE LIGHTS ARE CONTROLLED BY A BREAKER PANEL. MODIFY ALL EXISTING WIRING TO SUIT THE NEW OCCUPANCY SENSORS.

SENSOR SHALL BE ACUITY nWV PDT 16 KIT C/W WIREGUARD POWER PACK SHALL BE ACUITY nPP16 D EFP OR EQUAL

17. PAINT ALL EXPOSED CONDUITS TO MATCH THE ADJACENT PAINT COLOUR/FINISH. NO FASTENING OF THE CONDUIT TO THE ROOF DECK WILL BE PERMITTED; ALL CONDUITS SHALL BE SUPPORTED FROM STRUCTURAL MEMBERS.

LIGHT FIXTURE SCHEDULE: THE CONTRACTOR SHALL SITE VERIFY ALL LIGHTING VOLTAGES IN THE AREAS OF RETROFIT ON SITE PRIOR TO SUBMISSION OF SHOP DRAWINGS. ADVISE THE ENGINEER OF ANY FINDINGS THAT DEVIATE FROM 120V.

FIXTURE TYPE 'F1' – GE LBT-24-A-0-48-MM-840-VQ-LT-WHTE 2'X4', LED TROFFER, 4800 LUMENS, 4000K, T-BAR INSTALLATION

FIXTURE TYPE 'F2' - GE LBT-14-A-0-60-MM-840-VQ-LT-WHTE C/W DRYWALL MOUNT KIT (1'X4') [GESK09/69068] 1'X4', LED TROFFER, 6000 LUMENS, 4000K, DRYWALL INSTALLATION

FIXTURE TYPE 'F3' - GE ABV3-0-18-H-48-1D-QV-41-A-W 'LED HIGH BAY, 18,000 LUMENS, 4000K, SUSPENDED INSTALL WITH ADJUSTABLE CABLES.









NEW ROOF ACCESS LADDERS















SHING
S APPROX. 8" O.C.
E CAP
E BASE G
SIVE MEMBRANE DOWN FULL FASCIA SLOPED TO DF ROOF
ENER/WASHER - TYPICAL
" WOOD BLOCKING
RAL FIBER ATION RANE CAP
SHING RANE BASE SHING Y ROOF
RED INSULATION
_YWOOD S ON FASCIA





REMOVE EXISTING SEALANT AND PROVIDE NEW SEALANT ON BOTH SIDES OF ALL FOUR (4) PILASTERS AT JUNCTION WITH MASONRY WALL AND WINDOW FRAME







ROOF FRAMING PLAN NOTES:

- 1. U/S OF ROOF DECK AT PERIMETER AND HIGH POINTS TO MATCH ELEVATION OF EXISTING ROOF DECK. FIELD VERIFY.
- 2. TOP OF STEEL BEAMS TO MATCH ELEVATION OF EXISTING STEEL ROOF FRAMING. FIELD VERIFY.
- 3. TOTAL DEAD LOAD IS 25.0 psf, INCLUDING 2.0 psf FOR BEAM WEIGHT, AND INCLUDING ROOFING SYSTEM.
- 4. DEAD LOAD OF BUILT-UP ROOF SYSTEM IS ASSUMED TO BE 15.0 psf UNLESS NOTED.
- 5. LIVE LOAD IS A UNIFORM LOAD OF 30.7 psf PLUS ACCUMULATED SNOW LOAD (ASL) IN ACCORDANCE WITH THE ONTARIO BUILDING CODE REQUIREMENTS AND IN NO CASE LESS THAN AS NOTED ON PLAN.
- 6. STEEL ROOF DECK SHALL BE DESIGNED TO SUPPORT SPECIFIED TOTAL DEAD AND LIVE LOADS.
- MINIMUM BASE NOMINAL THICKNESS (BNT) OF STEEL DECK SHALL BE 0.030". 7. STEEL ROOF DECK SHALL BE INSTALLED FOR DIAPHRAGM ACTION IN ACCORDANCE WITH THE
- RECOMMENDATIONS OF THE CANADIAN SHEET STEEL BUILDING INSTITUTE AND TYPICAL NOTES.
- 8. SUBMIT DETAILS FOR ALL OPENINGS OTHER THAN THOSE SHOWN ON STRUCTURAL DRAWINGS TO STRUCTURAL CONSULTANT FOR REVIEW. 9. AN INDEPENDENT INSPECTION AND TESTING COMPANY IS TO INSPECT STRUCTURAL STEEL AND STEEL
- DECK IN THE SHOP AND IN THE FIELD FOR WELDING, CONNECTIONS, BOLT TORQUES, AND GENERAL CONFORMANCE WITH THE STRUCTURAL DRAWINGS AND SPECIFICATIONS.
- 10. NON-LOAD BEARING PARTITIONS SHALL BE A MINIMUM OF 25mm CLEAR FROM STRUCTURE. 11. SEE TYPICAL NOTES AND TYPICAL DETAILS DRAWINGS.

GENERAL NOTES

1.0 GENERAL

- 1.1 DESIGN AND CONSTRUCTION IS TO CONFORM TO THE REQUIREMENTS OF THE ONTARIO BUILDING CODE. REFER ALSO TO TYPICAL DETAILS AND NOTES UNDER PLANS ON THE STRUCTURAL DRAWINGS. ALL CODES, MANUALS, STANDARDS AND SPECIFICATIONS REFERRED TO SHALL BE THE LATEST EDITIONS INCLUDING ALL REVISIONS AND ADDENDA. ALL DIMENSIONS, OTHER THAN PURELY STRUCTURAL DIMENSIONS SHOWN ON THE STRUCTURAL DRAWINGS MUST BE CHECKED AGAINST THE EXISTING CONDITIONS AND ANY INCONSISTENCIES REPORTED TO THE PROJECT ENGINEER BEFORE PROCEEDING WITH THE WORK. STRUCTURAL DRAWINGS MUST NOT BE SCALED.
- 1.2 REFER TO ROOFING CONSULTANT DRAWINGS FOR LOCATIONS AND SIZES OF OPENINGS, SLEEVES AND DEPRESSIONS, NOT INDICATED ON THE STRUCTURAL DRAWINGS. UNLESS SPECIFICALLY NOTED OTHERWISE, THE ABOVE ITEMS WHERE SHOWN ON THE STRUCTURAL DRAWINGS ARE INDICATED ONLY APPROXIMATELY AS TO SIZE AND LOCATION.
- 1.3 UNLESS SPECIFICALLY NOTED OTHERWISE ON THE DRAWINGS, NO PROVISION HAS BEEN MADE IN THE DESIGN FOR CONDITIONS OCCURRING DURING CONSTRUCTION. THE CONTRACTOR IS TO PROVIDE ALL NECESSARY BRACINGS AND SHORING REQUIRED FOR STRESSES AND INSTABILITY OCCURRING FROM ANY CAUSE DURING CONSTRUCTION. THE CONTRACTOR SHALL ACCEPT FULL RESPONSIBILITY FOR ALL SUCH MEASURES. IT SHALL ALSO BE THE RESPONSIBILITY OF THE CONTRACTOR TO PROVIDE ALL NECESSARY BRACINGS, SHORINGS, SHEET PILING OR OTHER TEMPORARY SUPPORTS TO SAFEGUARD ALL EXISTING OR ADJACENT STRUCTURES EFFECTED BY THIS WORK.
- 2.0 SHOP DRAWINGS, PLACING DRAWINGS & BAR LISTS:-
- 2.1 FOR ALL STRUCTURAL COMPONENTS SHOWN ON THE STRUCTURAL DRAWINGS, SUBMIT COPIES OF SHOP DRAWINGS AS DIRECTED, FOR REVIEW BY THE STRUCTURAL CONSULTANT. SHOP DRAWINGS TO SHOW COMPLETE INFORMATION FOR THE FABRICATION AND ERECTION OF THE STRUCTURAL COMPONENTS.
- 2.2 REVIEW BY THE STRUCTURAL CONSULTANT SHALL NOT RELIEVE THE CONTRACTOR OF THE RESPONSIBILITY FOR SEEING THAT THE WORK IS COMPLETE, ACCURATE AND IN CONFORMITY WITH THE STRUCTURAL DRAWINGS AND SPECIFICATIONS.

3.0 INSPECTION AND TESTING:-

- 3.1 AN INDEPENDENT INSPECTION AND TESTING COMPANY IS TO BE ENGAGED TO CARRY OUT THE FOLLOWING SERVICES:-STRUCTURAL STEEL - ROUTINE FIELD INSPECTION SHALL BE CARRIED OUT IN ACCORDANCE WITH THE REQUIREMENTS OF CAN/CSA S16-14. 2. STEEL DECK - SEE STEEL DECK NOTES.
- 3.2 ALL INSPECTION AND TESTING SERVICES ARE TO BE PERFORMED BY COMPANIES CERTIFIED BY THE CANADIAN STANDARDS ASSOCIATION AND FOR WELDING, INSPECTORS ARE TO BE CERTIFIED BY THE CANADIAN WELDING BUREAU.

STRUCTURAL STEEL NOTES

1.0 GENERAL

- 1.1 STRUCTURAL STEEL CONNECTIONS SHALL CONFORM TO CSA STANDARD CAN/CSA S16-14 (LIMIT STATES DESIGN) & SHALL BE DESIGNED BY A LICENSED PROFESSIONAL ENGINEER EXPERIENCED IN THIS TYPE OF WORK.
- 1.2 REFER ALSO TO GENERAL NOTES AND NOTES UNDER PLANS.
- 1.3 WELDING SHALL CONFORM TO CSA STANDARD W59-13 AND BE PERFORMED BY A FABRICATOR CERTIFIED TO CSA W47.1-09 (R2014).
- 1.4 BEAM CONNECTIONS SHALL BE DESIGNED FOR A MINIMUM OF 50% OF THE BEAM SHEAR CAPACITY UNLESS OTHERWISE NOTED, & IN NO CASE BE LESS THAN THE LOADS SHOWN ON OR IMPLIED BY THE DRAWINGS.
- 2.0 PRODUCTS
- 2.1 ALL STRUCTURAL STEEL MEMBERS SHALL CONFORM TO CAN/CSA G40.20-13/G40.21-13. ROLLED SECTIONS, PLATES, SAG RODS, STRAP ANCHORS & BARS, EXCEPT WIDE FLANGE BEAMS SHALL BE TYPE 350W AND HOLLOW STRUCTURAL AND WIDE FLANGE BEAMS SECTIONS SHALL BE TYPE 350W, CLASS H FOR SQUARE HSS & CLASS C FOR ROUND HSS.
- 2.2 BOLTS, NUTS & WASHERS FOR CONNECTIONS TO CONFORM TO ASTM A325-14 UNLESS NOTED.
- 2.3 ANCHOR BOLTS, NUTS & WASHERS FOR BASE PLATES, BEARING PLATES & WELD PLATES TO CONFORM TO ASTM A307-14 UNLESS NOTED.
- 2.4 WELDING MATERIALS TO CONFORM TO CSA W48-14 (SERIES).
- 2.5 PRIMER PAINT TO CONFORM TO CGSB 1.40-M89 OR CISC/CPMA 2-75.
- 3.0 EXECUTION
- 3.1 FABRICATION, HANDLING & ERECTION TO CONFORM TO CAN/CSA S16-14.
- 3.2 CLEAN, PREPARE SURFACES AND SHOP PRIME STRUCTURAL STEEL WITH ONE COAT OF SPECIFIED PRIMER PAINT IN ACCORDANCE WITH CSA CAN3-S16-14. FIELD "TOUCH-UP" BOLTS, WELDS, BURNED OR SCRAPED SURFACES AFTER ERECTION.
- 3.3 PROVIDE ALL NECESSARY TEMPORARY BRACING TO KEEP STRUCTURE SAFE AND PLUMB. BRACING SHOWN ON STRUCTURAL DRAWINGS IS PERMANENT FOR FINISHED BUILDING ONLY.
- 3.4 CO-ORDINATE WITH SUB-TRADES WHOSE WORK MAY EFFECT DETAILING, FABRICATION & ERECTION OF THE STEEL STRUCTURE.
- 3.5 NO HOLES OTHER THAN THOSE SHOWN ON REVIEWED SHOP DRAWINGS SHALL BE MADE IN ANY STEEL MEMBER WITHOUT WRITTEN PERMISSION OF THE STRUCTURAL CONSULTANT.
- 4.0 QUALITY CONTROL
- 4.1 SEE GENERAL NOTES AND NOTES UNDER PLANS FOR INSPECTION & TESTING REQUIREMENTS.

STEEL DECK NOTES

0	GENERAL
1	DESIGN, FABRICATION, HANDLING & EF 1. CSA S136.
	2. CSSBI 10M: STANDARD FC
	3. CSSBI: STANDARD FC
	4. ASTM A525: GENERAL REC
	5. WELDING SHALL CONFORM TO CSA
	CERTIFIED TO CSA STANDARD W47

- 1.3 1. DEFLECTION OF ROOF DECK UNDER LIVE LOAD ONLY SHALL NOT EXCEED 1/240TH OF SPAN.
- MINIMUM ALLOWED.
- FORCES ARE PROPERLY TRANSMITTED.
- ERECTION.
- 2.0 PRODUCTS
- COATING.
- INTERLOCKING SIDE JOINTS BETWEEN PANELS. [MIN. BNT 0.030"]
- WELD BURNS AFTER DECK IS INSTALLED.
- TWO FLUTES EACH SIDE OF THE OPENING.
- TYPICAL DETAILS.
- 3.0 EXECUTION
- SUPPORTS.
- UPPER AND LOWER SURFACES.
- 4.0 QUALITY CONTROL
- ON THE FOLLOWING INSPECTION SERVICES:-. SECTION PROFILE, GAUGE & STEEL GRADE.
- ZINC COATING. WELDED JOINTS.
- BFARINGS. SIDE LAP CONNECTIONS.
- TOUCH-UP PRIMER. 7. FIELD CUTTING AND/OR ALTERATIONS.
- 4.2 REFER ALSO TO GENERAL NOTES.

ERECTION SHALL CONFORM TO THE FOLLOWING STANDARDS:-OR STEEL ROOF DECK.

OR COMPOSITE STEEL DECK. EQUIREMENTS FOR STEEL SHEET, ZINC COATED. SA STANDARD W59 AND BE PERFORMED BY A FABRICATOR

1.2 WHEREVER STRUCTURAL FRAMING PERMITS, STEEL DECK SHALL BE DESIGNED & FABRICATED TO SPAN CONTINUOUSLY OVER AT LEAST 4 SUPPORTS (3 SPANS). PROVIDE AN ADEQUATE INCREASE IN THICKNESS OF METAL TO COMPENSATE FOR CONTINUITY WHEREVER FEWER SUPPORTS MAY OCCUR. END LAPS TO BE A MIN. OF 50mm (2") AND BE LOCATED OVER SUPPORTS.

2. ROOF DECK SHALL BE FORMED WITH INTEGRAL RIBS IN ORDER TO SAFELY SUPPORT THE LOADS GIVEN ON THE DRAWINGS OVER THE SPANS REQUIRED. DECK THICKNESS GIVEN ON DRAWINGS IS

1.4 DESIGN & DETAIL ON SHOP DRAWINGS CONNECTIONS TO REPORTING MEMBERS SO THAT DIAPHRAGM

1.5 STEEL ROOF DECK SHALL BE DESIGNED BY A LICENSED PROFESSIONAL ENGINEER. SHOP DRAWINGS AND CALCULATIONS BEARING THE STAMP AND SIGNATURE OF THE PROFESSIONAL ENGINEER RESPONSIBLE FOR THE DESIGN SHALL BE SUBMITTED FOR REVIEW PRIOR TO FABRICATION AND

2.1 UNLESS OTHERWISE NOTED ROOF DECK SHALL BE FORMED OF METALLIC COATED SHEET STEEL CONFORMING TO CSSBI 101 M, & ASTM A446M, STRUCTURAL QUALITY GRADE 'A' WITH A ZF75 ZINC

2.2 UNLESS OTHERWISE NOTED DECK SHALL BE SINGLE FLUTED ELEMENT WITH INTEGRAL RIBS OF DEPTH & MIN. BASE NOMINAL THICKNESS (BNT) AS NOTED ON THE DRAWINGS. DECK SHALL HAVE

2.3 COVER PLATES, CELL CLOSURES, FLASHINGS & REINFORCING STIFFENERS FOR UNSUPPORTED EDGES TO BE SUPPLIED OF SIMILAR MATERIAL & ZINC COATING TO THAT FOR DECK, UNLESS NOTED. 2.4 PRIMER PAINT TO BE ZINC RICH, READY MIX TO CGSB 1-GP-181M FOR FIELD "TOUCH-UP" OF

2.5 UNLESS OTHERWISE SHOWN FOR OPENINGS THROUGH ROOF DECK FROM 150mm TO 450mm (6" TO 18") ACROSS THE FLUTES PROVIDE NOT LESS THAN A L50x50x6 (L2x2x1/4). REINFORCEMENT TO FRÁME ACROSS EACH SIDE OF THE OPENING PERPENDICULAR TO THE FLÚTES, WELDED TO AT LEAST

2.6 FOR ROOF OPENINGS OVER 450mm (18") ACROSS THE FLUTES AND FOR AREAS OF CONCENTRATED LOAD, REINFORCE IN ACCORDANCE WITH STRUCTURAL FRAMING DETAILS SHOWN ON PLANS OR

3.1 SUPPLY AND PLACE STEEL PACKING AS REQUIRED TO PRODUCE AN EVEN BEARING PRESSURE AT

3.2 UNLESS OTHERWISE NOTED ON DRAWINGS OR SPECIFICATION, PERMANENTLY ATTACH THE STEEL DECK TO BEARING SURFACES AS FOLLOWS: THE FIRST, THIRD & FIFTH LOW CORRUGATIONS, 300mm (12") MAX. CENTRES, & EACH SIDE OF EACH SHEET, ARC SPOT WELD WITH 20mm (3/4") NOMINAL TOP DIAMETER; - SIDE LAPS OF ADJACENT UNITS SHALL BE MECHANICALLY FASTENED @ 600mm (24") ON CENTRE MAX., OR WELDED USING 25mm (1") WELDS AT 600mm (24") MAX. SPACING; - SIDE CONDITIONS SHALL BE WELDED WITH 20mm (3/4") WELDS AT 900mm (36") MAX. SPACINGS. 3.3 "TOUCH-UP" GALVANIZED SURFACE WITH SPECIFIED PRIMER AT WELDS AND SCRAPES, ETC., BOTH

4.1 AN INDEPENDENT INSPECTION & TESTING COMPANY IS TO BE ENGAGED TO CARRY OUT AND REPORT



PARTIAL SKYLIGHT INFILL FRAMING PLAN #1 SCALE: 1/4" = 1'-0







SOUTH ELEVATION - Photo # 8

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WINDOWS REPLACEMENTS JOHN T TUCK PUBLIC SCHOOL 3365 SPRUCE AVENUE BURLINGTON, ONTARIO	A-1
AC K.T.S. 100-04-2021	
NTS 02/08/21	



NORTH ELEVATION - Photo #'s 1, 2 & 3



EAST ELEVATION - Photo #'s 4, 5 & 6



S/U

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W11

SOUTH ELEVATION - Photo # 8

(PARTIAL) EAST ELEVATION - Photo # 7














Existing Construction wall

