



RIMKUS

BIDDING DOCUMENTS

ROOF REHABILITATION PROGRAM

William Bolton Arena
40 Rossmore Road, Toronto, Ontario

PREPARED FOR

City of Toronto

RIMKUS MATTER NUMBER

100234875

Bid Meeting: At 12:30 pm EST on Friday, TBD, 2024

Bid Closing: By 2:00 pm EST on Friday, TBD, 2024

rimkus.com
800.580.3228

Consultants. Experts. Innovators.

2121 Argentia Road, 4th Floor
Mississauga, Ontario L5N 2X4

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PART 1 - GENERAL

1.1 INVITATION & SITE MEETING

- .1 Documents herein to form a standard construction contract between Owner and Contractor for a Stipulated Price. These documents along with provided plans, drawings, and schedules, before execution of contract, to hereafter be referred to as Bid Requirements.
- .2 Bidders, subject to qualification requirements set forth in this section, are invited to examine Bid Requirements and to, with due consideration, submit a Bid for performance of specified Work.
- .3 A "Mandatory Site Meeting" has been scheduled to facilitate project co-ordination and to assist in consideration of Bid Requirements. Bidders are required to attend meeting and sign "Site Meeting Log" to provide confirmation of attendance.
- .4 Mandatory Site Meeting to be held at:

Project Site: **WILLIAM BOLTON ARENA**
Place of Work: 40 Rossmore Road,
Toronto, Ontario, M6G 2M7

Location to Meet: Outside at Main Entrance
Date & Time: Friday, TBD, 2024, at 12:30 pm EST
- .5 Failure to attend Mandatory Site Meeting to result in Disqualification of Bid.

1.2 BIDDER QUALIFICATIONS

- .1 Bidders interested in contract for performance of specified Work must:
 - .1 have a minimum ten (10) years work experience with materials specified or similar comparable products,
 - .2 be a member in good standing with Ontario Industrial Roofing Contractors Association (OIRCA),
 - .3 and be licensed and insured for Place of Work.
- .2 Roofing Contractor must be pre-approved and certified by manufacturer of specified membrane material and installation type.
 - .1 Contractor's installers must be certified and carded for installation of specified materials.
 - .2 Contractor's employees and Subcontractors must be WHMIS certified.
 - .3 Owner reserves right to reject any proposed Subcontractor for reasonable cause.
- .3 Complete and submit questionnaire listing Contractor's qualifications on form provided by Owner or Consultant, or on CCDC11-2019 – Contractors' Qualifications Statement, where specifically requested before award of contract.
 - .1 Acceptance or rejection of submitted qualifications for suitability to perform specified Work to be made within three (3) working days.

1.3 EXAMINATION OF DRAWINGS, SPECIFICATIONS, AND WORK SITE

- .1 Carefully examine and study all Bid Requirements together with existing site conditions and any other necessary data or conditions that may affect performance of Work in order to determine full extent of Work.

- .1 Under no circumstances will any claims be allowed against Owner resulting from failure to ascertain full extent of Work herein described, specified, or implied.
- .2 Contractor to verify to own satisfaction that existing site conditions, roof components, and measurements are accurately reported in Bid Requirements. Obtain or check all measurements and dimensions at worksite as may be necessary and required for performance of Work.
- .3 Promptly report in writing any discrepancies, errors, conflicts, or omissions to Consultant when discovered and prior to Bid Closing.
 - .1 Drawings, specifications, and schedules are complementary to each other; what is called for by one to be binding as if called for by all.
 - .2 Should any discrepancy appear between documents leaving doubt as to intent or meaning, most stringent requirement to govern unless directed otherwise in writing by Consultant.
- .4 Bid submission to be based on products, equipment, and/or suppliers named and identified as approved or accepted in technical specifications and drawings.
 - .1 Bid Documents constitute acceptable roofing installations.
 - .2 No deviation from specifications, drawings, or approved shop drawings allowed without prior written approval by Consultant, and if applicable by Manufacturer.
- .5 Unless specifically identified in Bid Requirements, any hazardous materials encountered during Work that requires specialized handling and incurs additional cost to be added to Contract Price.
- .6 Weather conditions are considered incidental to Work and not considered additional to Bid Price.

1.4 QUESTIONS AND DISCREPANCIES

- .1 Report, when discovered and prior to Bid Closing, all discrepancies, errors, omissions, departures from building By-laws, deviations from good practice, and points considered to be of dubious intent, so that Consultant may issue clarifications.
- .2 Address questions regarding Contract Documents to Consultant:

Attention:	Marco Merolle
Office:	RIMKUS CONSULTING GROUP CANADA Inc.
Address:	2121 Argentia Road, 4th Floor, Mississauga, Ontario, L5N 2X4
Telephone:	905.607.7244
Facsimile:	905.607.7288
Email:	mmerolle@rimkus.com

1.5 ADDENDA

- .1 If necessary, and time permits, addenda may be issued to Bidders before date set for receiving Bid Submissions. Do not take into consideration in your Bid, any instructions or answers given orally unless confirmed in writing.
- .2 Insert in space provided on Bid Form, numbers of all addenda received during bidding period, including any bound into specifications. If no addenda have been received, insert word "None" instead.

1.1 BID SUBMISSION

- .1 Bidders to be solely responsible for delivery of their own Bids by manner and time prescribed.
- .2 Bidders to state Total Stipulated Price to undertake and perform Work as described or shown in Bid Requirement Documents.
- .3 Submit one scanned copy of executed offer on Bid Form provided, signed and with corporate seal, together with all required submission documents and certificates.
- .4 Deliver Bid Submission by NO LATER THAN 2:00 pm EST on Friday, TBD, 2024.
- .5 Submit Bid Documents and all required submittals in electronic format (either PDF or JPG) and deliver, by email only, on or before Closing Date and Time.
 - .1 Email Bid Submission documents to:
 - .1 Daniel Ndirangu, Capital Planning at: daniel.ndirangu@toronto.ca.
 - .2 Marco Merolle (IRC Group) at: mmerolle@rimkus.com.
 - .2 Limit size of email submission and attachments to under 20 MB maximum, per email.
 - .3 Time stamp set in Bid Receiver's email application deemed to be official time of receipt.
 - .4 Do not send hardcopy originals of Bid Submission to City of Toronto.
 - .5 Amendments to Bid already submitted will be permitted if written and received in electronic format to daniel.ndirangu@toronto.ca, including those noted above, by Closing Date and Time, and if endorsed by same party or parties from original sealed offer.
- .6 Offers submitted after Closing Date and Time will remain unopened and deemed disqualified at discretion of Owner's Representative.

1.2 BID SUBMITTALS

- .1 Bid Bond:
 - .1 Bid deposit required on projects valued over \$50,000^{.00} in form of Bid Bond from a Surety acceptable to Owner, bank draft, money order, certified cheque equal to a minimum of 10% of Bid value.
 - .2 Make Bid Bond payable to City of Toronto, valid for a minimum period of sixty (60) days from date of Bid Closing unless stipulated otherwise in Bid Requirements.
 - .3 Bid Bonds to be returned to unsuccessful Bidders after award of contract.
- .2 Performance Bond and Labour and Materials Payment Bond:
 - .1 On projects valued over \$50,000^{.00}, submit with Bid an Agreement to Bond form or a Consent of Surety, stating that surety is willing to supply specified Performance and Labour and Materials Payment Bond.
 - .2 Performance Bond and Labour and Materials Payment Bond to be furnished by same surety Company who issues Bid Bond.
 - .3 Bonds to be for 100% Performance and 100% Labour & Materials.
- .3 Insurance:

- .1 Provide a signed "Undertaking of Insurance" on standard form provided by insurance company stating intention to provide insurance to Bidder in accordance with insurance requirements of Contract Documents.
 - .1 Insurance is to include for and identify on form that both Owner and Consultant are named as extra insured.
- .2 General Liability insurance in an amount not less than ten million (\$10,000,000⁰⁰).
- .3 Motor Vehicle Liability insurance in an amount not less than two million (\$2,000,000⁰⁰).
- .4 Project Schedule:
 - .1 Submit a detailed bar diagram schedule of Work, detailing start and completion dates for various items of work necessary to perform contract to Total Completion. Contractor's schedule, as may be amended and agreed upon, to then become part of Contract.
- .5 Health and Safety Plan:
 - .1 Submit copy for review:
 - .1 Health and Safety Plan specific to worksite for Contractors and Subcontractors.
 - .2 Covid-19 policy and procedures for Contractors and Subcontractors.
- .6 Workers Compensation Board for Place of Work:
 - .1 Provide a copy of current WSIB Clearance Letter.
- .7 Warranties:
 - .1 Provide sample copy of specified Manufacturer's Labour, Material and Workmanship Warranty to be applied on designated low slope roof areas.
 - .2 Provide a sample copy of specified Contractor's Workmanship Warranty.
- .8 Manufacturer's Warranty Letter:
 - .1 Copy of letter from one specified Membrane Manufacturer stating opinion that Bidder is qualified to meet requirements of work and is approved to receive specified Labour, Material, and Workmanship Warranty for successful completion of this specific project.
 - .1 NOTE: FAILURE TO PROVIDE WARRANTY LETTER WILL RESULT IN BID DEEMED TO BE INFORMAL WITH NO CONSIDERATION GIVEN TO BID.
- .9 Project Schedule:
 - .1 Submit a detailed bar diagram schedule of Work, detailing start and completion dates for various items of work necessary to perform contract to Total Completion. Contractor's schedule, as may be amended and agreed upon, to then become part of Contract.
- .10 Health and Safety Plan:
 - .1 Submit copy for review:
 - .1 Health and Safety Plan specific to worksite for Contractors and Subcontractors.
 - .2 Covid-19 policy and procedures for Contractors and Subcontractors.

- .11 Workers Compensation Board for Place of Work:
 - .1 Provide a copy of current WSIB Clearance Letter.
- .12 Warranties:
 - .1 Provide sample copy of specified Manufacturer's Labour, Material and Workmanship Warranty to be applied on designated low slope roof areas.
 - .2 Provide a sample copy of specified Contractor's Workmanship Warranty.

1.3 BID SIGNING AND REQUIREMENTS

- .1 Type or legibly print Bidder's full business name and address in spaces provided on Bid Form. Bidder to sign, date, and seal Bid Form in space provided.
- .2 Signing and Sealing:
 - .1 Sole Proprietorship: Signature of sole proprietor in presence of witness who will also sign. Insert words "Sole Proprietor" under signature. Affix seal.
 - .2 Partnership: Signature of all partners in presence of witness who will also sign. Insert word 'Partner' under each signature. Affix seal to each signature.
 - .3 Limited Company: Signature of duly authorized signing officer(s) in normal signatures. Insert officer's capacity in which signing officer acts, under each signature. Affix corporate seal. If Bid is signed by officials other than President and Secretary of company, or President-Secretary-Treasurer of company, copy of by-law resolution of Board of Directors authorizing them to do so must also be submitted with Bid.
- .3 Taxes:
 - .1 Include in your Bid Price all provincial retail sales tax and other applicable taxes or duties. Show federal and value added taxes, where applicable, as separate items on Bid Form.
- .4 Hours of Work:
 - .1 Perform Work between 7:00 AM and 6:00 PM, Monday through Friday, unless otherwise approved by Owner. Consult with Owner or Owner's Representative for special access times.

1.4 OFFER ACCEPTANCE AND REJECTION

- .1 No announcement concerning successful bid will be made until a complete report and analysis is prepared by Owner or Consultant.
- .2 Duration of Offer:
 - .1 Bids to remain open to acceptance, and irrevocable for 60 (sixty) days after Closing Date.
- .3 Acceptance of Offer:
 - .1 Owner reserves right to accept or reject any or all offers.
 - .2 Successful Bidder will receive written notice of Bid acceptance and Award by Owner.
 - .3 Lowest or any Bid will not necessarily be accepted.
- .4 Bid Ineligibility :

- .1 Bids that are unsigned, improperly signed or sealed, conditional, illegible, obscure, contain arithmetical errors, erasures, alterations, or irregularities of any kind, may, at discretion of Owner or Owner's Representative, be declared informal.
- .2 Bids with Forms and Submittals improperly prepared may, at discretion of Owner or Owner's Representative, be declared informal.
- .3 Bids that fail insurance requirements may, at discretion of Owner or Owners representative, be declared informal.
- .4 Bids are by invitation only from selected Bidders. Bids from unsolicited Bidders to be returned unopened.
- .5 More than one Bid form from an individual firm, partnership, corporation or association under same or different names will not be considered. Collusion between Bidders will be sufficient cause for rejection of all Bidders so affected.

1.5 WITHDRAWAL OF BID

- .1 A Bidder will be permitted to withdraw own Bid unopened after it has been deposited, provided that such request is received in writing prior to time specified for opening of Bid submissions.

1.6 CONTRACT DOCUMENTS

- .1 Successful Bidder to sign a standard Canadian construction document CCDC2-2020 - Stipulated Price Contract between Owner and Contractor.
- .2 Submit to Consultant a minimum of fifteen (15) days prior to Accepted Bidder staging on site:
 - .1 A certified true copy of Liability Insurance certificate naming Owner and Consultant as extra insured.
 - .2 A certified true copy of WSIB Clearance Letter confirming that Contractor has complied with requirements of Worker's Compensation Board.
 - .3 A preliminary project schedule indicating Start-up and Substantial Completion dates.

1.7 PROJECT SCHEDULE

- .1 Owner requires that work of this contract be completed as quickly as possible. Consideration will be given to time required for total performance of specified work during review of submitted Bids.
- .2 Contractor to mobilize his forces and trades to commence work on site as soon as possible after Award of Contract, weather permitting.

1.8 WARRANTY

- .1 Contractor Workmanship Warranty:
 - .1 On Roof Areas 1.1 and 2.1: Provide Owner with Contractor's Warranty for Workmanship on an Ontario Industrial Roofing Contractors Association (OIRCA) approved form, signed, authorized, and executed. Warranty period to be for minimum two (2) years from date of Substantial Completion.
 - .1 During Contractor's warranty term, any work related to roofing, flashing, or metal found to be defective or otherwise not in accordance with Contract Documents, to be promptly repaired by Contractor at no additional cost to Owner and in accordance with drawings and specifications. Applicator's warranty obligation to run directly to Owner with a copy sent to Manufacturer.

- .2 Roof System Warranty:
 - .1 On Roof Areas 1.1 and 2.1: Provide Owner with Manufacturer's Labour, Material and Workmanship N.D.L. (No Dollar Limit) System Warranty for a period of ten (10) years on roof replacement areas.
 - .1 Owner to notify both membrane Manufacturer and Contractor of any leak that occurs during time period while warranties remain in effect.
- .3 Cost of all warranties to be included in Contract Amount.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION - 00 21 13

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PART 1 - GENERAL

1.1 FORM OF CONTRACT

- .1 The form of contract between the Owner and the Contractor for performance of the Work described in these Contract Documents to be as per the Agreement, Definitions, and General Conditions (Parts 1 through 13 inclusive) of standard construction document CCDC2-2020 - Stipulated Price Contract.

1.2 AMMENDMENTS

- .1 The form of contract, CCDC2-2020 - Stipulated Price Contract, is modified by the amendments listed in Section 00 73 00 - Supplementary Conditions.

PART 2 - PRODUCTS

2.1 NOT USED.

PART 3 - EXECUTION

3.1 NOT USED.

END OF SECTION - 00 72 13

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The standard construction document CCDC2–2020 – Stipulated Price Contract, English version, consisting of the Agreement Between Owner and Contractor, Definitions, and General Conditions of the Stipulated Price Contract, is amended as follows:

AMENDMENTS TO: AGREEMENT BETWEEN OWNER AND CONTRACTOR

AMENDMENTS TO: DEFINITIONS

Add the following definition:

Submittals

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

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

AMENDMENTS TO: GENERAL CONDITIONS OF THE STIPULATED PRICE CONTRACT

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

GC 1.1 CONTRACT DOCUMENTS

- .1 Delete paragraph 1.1.4 and replace with new paragraph 1.1.4:

1.1.4 The Contractor shall review the Contract Documents and promptly report to the Consultant any error, inconsistency, or omission the Contractor may discover. Such review by the Contractor shall comply with the standard of care described in new paragraph 3.7.4. Except for the obligation to make such review and report the result, the Contractor does not assume any responsibility to the Owner or to the Consultant for the accuracy of Contract Documents, provided it has exercised the degree of care and skilled described in this paragraph, the Contractor shall not be liable for damage or costs resulting from such errors, inconsistencies, or omissions in the Contract Documents, which the Contractor could not reasonably discover. If the Contractor does discover any error, inconsistency, or omission in the Contract Documents, the Contractor shall not proceed with the Work affected until the Contractor has received corrected or missing information from the Consultant. Notwithstanding the foregoing, errors, inconsistencies, discrepancies, or omissions in the Contract Documents shall not include lack of reference on Drawings or in Specifications to labour, Products, and Construction Equipment that are normally required or normally recognized within respective trade practices as being necessary for the complete performance of the Work.

- .2 Add to the end of paragraph 1.1.10:

The Specifications shall be read as a whole and neither the organization nor the division of the Specifications nor anything else contained in the Contract Documents will be construed to place responsibility on the Consultant to settle disputes among the Subcontractors and Suppliers in respect to such organization or division. The Specifications are the minimum construction requirements. Where the Specifications differ or potentially differ from federal, provincial and

local laws, regulations, bylaws, standards and requirements, the Contractor shall request clarification from the Consultant prior to proceeding with the Work.

.3 Add new paragraph 1.1.12:

1.1.12 The intent of the Contract Documents is to include all labour, Products, materials, Construction Equipment, and services necessary or normally considered necessary for the performance of the Work in accordance with the Contract Documents. Any item of the Work mentioned in the Specifications and not shown on the Drawings, or shown on the Drawings and not mentioned in the Specifications shall be provided by the Contractor as if shown or mentioned in both. All materials or labour for Work which are shown on the Contract Documents or are reasonably inferable therefrom as being necessary to complete the Work in accordance with the Contract Documents shall be provided by the Contractor.

GC 2.2 ROLE OF THE CONSULTANT

.1 Add to the end of paragraph 2.2.8:

The Owner and the Contractor hereby waive any claims against the Consultant arising out of the making of interpretations and findings made in accordance with paragraphs 2.2.6, 2.2.7 and 2.2.8.

.2 Modify paragraph 2.2.13:

Delete the words “submittals by the Contractor, in accordance with” and substitute the words “Submittals provided by the Contractor which are in accordance with” in paragraph 2.2.13.

.3 Add new paragraph 2.2.5.1:

The Consultant will not have control over, charge of, or be responsible for the acts or omissions of the Contractor, Subcontractors, Suppliers, or their agents, employees, or any other person performing portions of the Work.

GC 2.4 DEFECTIVE WORK

.1 Add new paragraphs 2.4.1.1 and 2.4.1.2:

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

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

GC 3.1 CONTROL OF THE WORK

.1 Add new paragraph 3.1.3:

3.1.3 Prior to commencing individual procurement, fabrication, and construction activities, the Contractor shall verify all relevant measurements and levels necessary for proper and complete fabrication, assembly, and installation of the Work at the Place of the Work, and shall further carefully compare such field

measurements and conditions with the requirements of the Contract Documents. Where dimensions are not included or contradictions exist, or exact locations are not apparent, the Contractor shall immediately notify the Consultant in writing and obtain written instructions from the Consultant before proceeding with any part of the affected Work.

GC 3.2 CONSTRUCTION BY OWNER OR OTHER CONTRACTORS

.1 Delete paragraph 3.2.2.1.

.2 Add to the end of paragraph 3.2.3.2:

with the Work of the Contractor, and connect as specified or shown in the Contract Documents;

.3 Add to the end of paragraph 3.2.3.4:

Failure by the Contractor to so report shall invalidate any claims against the Owner by reason of the deficiencies in the work of other Contractors or Owner's own forces except those deficiencies not then apparent or reasonably discoverable; and

.4 Add a new paragraph 3.2.3.5:

3.2.3.5 For the Owner's own forces and for Other Contractors, the Contractor shall assume overall responsibility for compliance with all aspects of the applicable health and construction safety legislation at the Place of the Work and all related rules, regulations, and practices on the Project.

GC 3.7 LABOUR AND PRODUCTS

.1 Add new paragraph 3.7.1.1:

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

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

.2 Add new paragraph 3.7.4:

3.7.4 In performing its services and obligations under the Contract, the Contractor shall exercise a standard of care, skill, and diligence that would normally be exercised by an experienced, skilled, and prudent Contractor supplying similar services for similar projects. The Contractor acknowledges and agrees that, throughout the Contract, the Contractor's obligations, duties, and responsibilities shall be interpreted in accordance with this standard. The Contractor shall exercise the same standard of care and due diligence in respect of any Construction Equipment, Products, Subcontractors, Suppliers, personnel, or procedures which it may recommend to the Owner or employ on the Project.

- .3 Add new paragraph 3.7.5:

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

GC 3.8 SHOP DRAWINGS

- .1 Add the words “AND OTHER SUBMITTALS” to the Title after SHOP DRAWINGS.

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

- .3 Add new paragraph 3.8.2.1:

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

- .4 Modify paragraph 3.8.7:

Delete the words “with reasonable promptness so as to cause no delay in the performance of the Work” and replace with “within 10 Working Days or such longer period as may be reasonably required” in paragraph 3.8.7.

GC 4.1 CASH ALLOWANCES

- .1 Delete paragraph 4.1.4 and substitute new paragraph 4.1.4:

4.1.4 Where costs under a cash allowance exceed the amount of the allowance, unexpended amounts from other cash allowances shall be reallocated at the Consultant’s direction to cover the shortfall.

- .2 Delete paragraph 4.1.5 and substitute new paragraph 4.1.5:

4.1.5 The net amount of any unexpended cash allowances, after providing for any reallocations as contemplated in paragraph 4.1.4, shall be deducted from the Contract Price by Change Order.

- .3 Delete paragraph 4.1.7 and substitute new paragraph 4.1.7:

4.1.7 At the commencement of the Work, the Contractor shall prepare for the review and acceptance of the Owner and the Consultant, a schedule indicating the times that cash allowance items and items that are to be supplied by the Owner and installed or hooked up by the Contractor are required at the Project site. Such schedule shall be consistent with the construction schedule referred to in GC 3.4 and shall avoid delaying the progress of the Work.

- .4 Add new paragraph 4.1.8:

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

GC 5.1 FINANCING INFORMATION REQUIRED OF THE OWNER

- .1 Delete GC 5.1 in its entirety.

GC 5.3 PAYMENT

- .1 Delete paragraph 5.3.1.2 and substitute new paragraph 5.3.1.2:

5.3.1.2 The Owner shall make payment to the Contractor on account as provided in Article A-5 of the Agreement – PAYMENT no later than 30 calendar days after the date of a certificate of payment issued by the Consultant, and in compliance with Payment Legislation.

GC 5.4 SUBSTANTIAL PERFORMANCE OF THE WORK

- .1 Delete paragraph 5.4.1.2 and substitute new paragraph 5.4.1.2:

5.4.1.2 Immediately prior to the issuance of the certificate of Substantial Performance of the Work, the Contractor, in consultation with the Consultant, shall establish reasonable dates for finishing the Work and correcting deficiencies.

- .2 Add new paragraph 5.4.7:

5.4.7 Within 7 calendar days of receiving a copy of the certificate of Substantial Performance of the Work signed by the Consultant, the Contractor shall publish a copy of the certificate in a construction trade newspaper (as that term is defined in the Construction Lien Act) and shall provide to the Consultant and the Owner the date of publication and the name of the construction trade newspaper in which the publication occurred. If the Contractor fails to comply with this provision, the Owner may publish a copy of the certificate and charge the Contractor with the costs so incurred.

GC 5.5 SUBSTANTIAL PERFORMANCE OF THE WORK AND PAYMENT OF HOLDBACK

- .1 Delete paragraph 5.4.2 in its entirety.

GC 5.8 CONSTRUCTION LIENS

- .1 Add new General Condition 5.8:

5.8.1 In the event that a written notice of lien related to the performance of the Work is received by the Owner, the Contractor shall, within ten (10) calendar days, at its sole expense, arrange for the withdrawal or other disposal of the written notice of lien.

5.8.2 If a lien arising from the performance of the Work is filed or registered against the Project lands, the Contractor shall, within ten (10) calendar days, at its expense, secure the discharge, release, vacating or withdrawal of such lien by payment or by giving security or in such other manner as is or may be required or permitted by law. If the lien is vacated, the Contractor shall, if requested, undertake the Owner's defence of any subsequent action commenced in respect of the lien at the Contractor's expense.

5.8.3 If the Contractor fails or refuses to secure the discharge, release, vacating or withdrawal of a lien or written notice of lien within the time prescribed above, the

Owner may, but shall not be required, take such steps as it, in its absolute discretion, may deem necessary to release, vacate and/or discharge the lien or written notice of lien, and all costs incurred by the Owner in doing so (including, without limitation, legal fees on a solicitor and his own client basis and any payment which may ultimately be made out of or pursuant to security posted to vacate the lien) shall be for the account of the Contractor, and the Owner may deduct such amounts from the amounts otherwise due or owing to the Contractor.

GC 6.4 CONCEALED OR UNKNOWN CONDITIONS

- .1 Add new paragraph 6.4.5:

6.4.5 The Contractor confirms that, prior to entering the Contract it has carefully investigated the Place of the Work and the Contract Documents to fully ascertain existing conditions, circumstances and limitations affecting the Work, and applied to that investigation the degree of care and skill described in paragraph 3.7.4. If the Contractor has not conducted such careful investigation, it is deemed to assume all risk of conditions or circumstances now existing or arising in the course of the Work which could make the Work more expensive or more difficult to perform than was contemplated at the time the Contract was executed. No allowances will be made for additional costs and no claims by the Contractor will be entertained in connection with conditions which could reasonably have been ascertained by such investigation or other due diligence undertaken prior to the execution of the Contract.

GC 6.5 DELAYS

- .1 Delete the last sentence of each of paragraphs 6.5.1 and 6.5.2 and substitute the following in each case:

Subject to the Contractor's obligation to mitigate costs, Contractor shall be reimbursed by the Owner for reasonable direct costs directly flowing from the delay, including reasonable costs incurred by the Contractor for the care, maintenance and protection of the Work site, but excluding any consequential, indirect or special damages, and any claims for loss of profit or opportunity.

- .2 Delete the period at the end of paragraph 6.5.3 and substitute the following words:

, in which case, and subject to the Contractor's obligation to mitigate costs, the Contractor shall be reimbursed by the Owner for reasonable direct costs directly flowing from the delay, including reasonable costs incurred by the Contractor for the care, maintenance and protection of the Work site, but excluding any consequential, indirect or special damages, and any claims for loss of profit or opportunity.

- .3 Add new paragraph 6.5.6:

6.5.6 If the Contractor is delayed in the performance of the Work by an act or omission of the Contractor or anyone employed or engaged by the Contractor directly or indirectly, or by any cause within the Contractor's control, then the Contract Time shall be extended for such reasonable time as the Consultant may decide in consultation with the Contractor. The Owner shall be reimbursed by the Contractor for all reasonable costs incurred by the Owner as the result of such delay, including all services required by the Owner from the Consultant as a result of such delay by the Contractor and, in particular, the cost of the

Consultant's services during the period between the date of Substantial Performance of the Work stated in Article A-1 of the Agreement, as the same may be extended through the provisions of these General Conditions, and any later, actual date of Substantial Performance of the Work achieved by the Contractor.

GC 6.6 CLAIMS FOR A CHANGE IN CONTRACT PRICE

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

GC 7.1 OWNER'S RIGHT TO PERFORM THE WORK, TERMINATE THE CONTRACTOR'S RIGHT TO CONTINUE WITH THE WORK OR TERMINATE THE CONTRACT

- .1 Add a new paragraph 7.1.5A immediately after paragraph 7.1.5:

7.1.5A The Owner may terminate the Contract at any time for any or no reason. In such event, the Owner shall pay for the Work performed up to the effective date of termination, including demobilization costs, and, subject to the Contractor's obligation to mitigate costs, the Owner shall pay for such additional costs, if any, directly flowing from and which are a reasonable consequence of the termination, but excluding any consequential, indirect or special damages, and any claims for loss of profit or opportunity. The Owner shall not be liable to the Contractor for any other claims, costs or damages whatsoever arising from such termination of the Contract.

GC 7.2 CONTRACTOR'S RIGHT TO STOP THE WORK OR TERMINATE CONTRACT

- .1 Add new paragraph 7.2.6:

7.2.6 If the Contractor stops the Work or terminates the Contract as provided for in paragraphs 7.2.1 through 7.2.5, the Contractor shall ensure the Project site and the Work are left in a secure condition as required by authorities having jurisdiction and the Contract Documents.

GC 8.3 NEGOTIATION, MEDIATION AND ARBITRATION

- .1 Add the following new paragraphs 8.3.9, 8.3.10, 8.3.11, 8.3.12, 8.3.13, and 8.3.14:

8.3.9 Within 5 days of receipt of the notice of arbitration by the responding party under paragraph 8.3.6, the Owner and the Contractor shall give the Consultant a written notice containing:

- a) a copy of the notice of arbitration;
- b) a copy of supplementary conditions 8.3.9 to 8.3.14 of this Contract; and
- c) any claims or issues which the Contractor or the Owner, as the case may be, wishes to raise in relation to the Consultant arising out of the issues in dispute in the arbitration.

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

- a) has a vested or contingent financial interest in the outcome of the arbitration;
 - b) gives the notice of election to the Owner and the Contractor before the arbitrator is appointed;
 - c) agrees to be a party to the arbitration within the meaning of the rules referred to in paragraph 8.3.6; and
 - d) agrees to be bound by the arbitral award made in the arbitration.
- 8.3.11 If an election is made under paragraph 8.3.10, the Consultant may participate in the appointment of the arbitrator and, notwithstanding the rules referred to in paragraph 8.3.6, the time period for reaching agreement on the appointment of the arbitrator shall begin to run from the date the respondent receives a copy of the notice of arbitration.
- 8.3.12 The arbitrator in the arbitration in which the Consultant has elected under paragraph 8.3.10 to become a full party may:
- a) on application of the Owner or the Contractor, determine whether the Consultant has satisfied the requirements of paragraph 8.3.10; and
 - b) make any procedural order considered necessary to facilitate the addition of the Consultant as a party to the arbitration.
- 8.3.13 The provisions of paragraph 8.3.9 shall apply mutatis mutandis to written notice to be given by the Consultant to any Sub-Consultant.
- 8.3.14 In the event of notice of arbitration given by the Consultant to a Sub-Consultant, the Sub-Consultant is not entitled to any election with respect to the proceeding as outlined in 8.3.10, and is deemed to be bound by the arbitration proceeding.

GC 9.1 PROTECTION OF WORK AND PROPERTY

- .1 Delete paragraph 9.1.1.1 and substitute new paragraph 9.1.1.1:
 - 9.1.1.1 errors in the Contract Documents which the Contractor could not have reasonably discovered applying the standard of care described in paragraph 3.7.4;
- .2 Delete paragraph 9.1.2 and substitute the following new paragraph 9.1.2:
 - 9.1.2 Before commencing the Work, the Contractor shall determine the locations of all underground utilities and structures indicated in the Contract Documents, or that are discoverable by a review of the Place of the Work applying the degree of care and skill described in paragraph 3.7.4, including existing services that may be affected by the Work.

GC 9.2 TOXIC AND HAZARDOUS SUBSTANCES

- .1 Add to paragraph 9.2.6 after the word "responsible", the following new words:
 - , or whether any toxic or hazardous substances or materials already at the Place of the Work (and which were then harmless or stored, contained or otherwise dealt with in accordance with legal and regulatory requirements) were dealt with

by the Contractor or anyone for whom the Contractor is responsible in a manner which does not comply with legal and regulatory requirements, or which threatens human health and safety or the environment, or material damage to the property of the Owner or others,

- .2 Add to the end of paragraph 9.2.7.3 the following new words:

, but excluding any consequential, indirect or special damages, and any claims for loss of profit or opportunity.

- .3 Add to paragraph 9.2.8 after the word "responsible", the following new words:

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

GC 9.4 CONSTRUCTION SAFETY

- .1 Add new paragraph 9.4.1.1:

9.4.1.1 The Contractor represents and warrants to the Owner that appropriate health and construction safety instruction and training have been provided and will be provided to the Contractor's employees, Subcontractors, and Suppliers attending the Project site. The Contractor also undertakes to provide such health and construction safety instruction and training to the Owner's representatives, the Owner's own forces and Other Contractors, should they fall under the jurisdiction of the Contractor as more particularly described in paragraph 9.4.4.

GC 9.5 MOULD

- .1 Add to the end of paragraph 9.5.3.3 the following new words:

, but excluding any consequential, indirect or special damages, and any claims for loss of profit or opportunity.

GC 10.2 LAWS, NOTICES, PERMITS, AND FEES

- .1 Add new paragraph 10.2.3.1:

10.2.3.1 Contractor shall obtain and pay for building permits for repair, rehabilitation, and replacement projects at existing buildings when required by authorities having jurisdiction at the Place of the Work.

- .2 Modify paragraph 10.2.5:

Delete from the first line of paragraph 10.2.5 the words, "The Contractor" and substitute the words "Subject to the standard of care described in paragraph 3.7.4, the Contractor".

GC 11.1 INSURANCE

.3 Add new paragraphs 11.1.9 and 11.1.10:

11.1.9 All insurance required of the Contractor will be primary over any other insurance that might be carried by the Owner.

11.1.10 By requiring the Contractor to carry insurance, the Owner does not represent that coverage and limits will necessarily be adequate to protect the Contractor. The insurance effected or procured by the Contractor will not reduce or limit the Contractor's contractual obligation to indemnify and defend the Owner for claims or suits which result from or are connected with the performance of this Contract.

GC 12.1 INDEMNIFICATION

.1 Add new paragraph 12.1.7:

12.1.7 The Contractor's obligation to indemnify the Consultant.

12.1.7.1 The Contractor shall indemnify and hold harmless the Consultant, its agents and employees from and against all claims, demands, losses, costs, damages, actions, suits, or proceedings (hereinafter collectively referred to as "claims") by third parties that arise out of, or are attributable in any respect to, the Contractor's performance of the Contract, provided such claims:

- a. are caused by negligent acts or omissions of the Contractor or anyone for whose acts or omissions the Contractor may be liable, and
- b. are made in writing within a period of 6 years from the date of Substantial Performance of the Work as set out in the certificate of Substantial Performance of the Work issued pursuant to paragraph 5.4.1.2 of GC 5.4 – SUBSTANTIAL PERFORMANCE OF THE WORK AND PAYMENT OF HOLDBACK, or within such shorter period as may be prescribed by any limitation statute of the province or territory of the Place of the Work.

12.1.7.2 The obligation of the Contractor to indemnify the Consultant as set forth in paragraph 12.1.7.1 shall be limited as follows:

- a. In respect of claims for which insurance is to be provided by the Contractor pursuant to GC 11.1 – INSURANCE, the general liability insurance limit for one occurrence as referred to in CCDC41-2020 in effect at the time of bid closing.
- b. In respect of claims for which insurance is not required to be provided by the Contractor in accordance with GC 11.1 – INSURANCE, the greater of the Contract Price as recorded in Article A-4 – CONTRACT PRICE or \$2,000,000, but in no event shall the sum be greater than \$20,000,000.
- c. In respect of claims by third parties for direct loss resulting from bodily injury, sickness, disease or death, or to injury to or destruction of tangible property, the obligation to indemnify is

without limit. In respect to all other claims for indemnity as a result of claims advanced by third parties, the limits of indemnity set forth in paragraphs 12.1.7.2.a and 12.1.7.2.b shall apply.

12.1.7.3 The Contractor's obligation to indemnify as set forth in paragraphs 12.1.7.1 and 12.1.7.2 shall be inclusive of interest and all legal costs.

12.1.7.4 The Contractor acknowledges that the Consultant is a third party beneficiary under this paragraph 12.1.7 and that the Consultant shall be entitled to plead this paragraph 12.1.7 in any action or arbitration and the Contractor waives any defence to such pleading by the Consultant. The Contractor further acknowledges that the Owner is contracting in this respect as agent for the Consultant, but in this respect only.

GC 12.3 WARRANTY

.1 Delete paragraph 12.3.1 and substitute new paragraph 12.3.1:

12.3.1 Except for extended warranties as described in paragraph 12.3.6, and except for those warranty periods specified in the Contract Documents for certain portions of the Work or Products, the warranty period under the Contract is two years from the date of Substantial Performance of the Work.

.2 Delete from the first line of paragraph 12.3.2 the word "The Contractor" and substitute the words:

Subject to the standard of care described in paragraph 3.7.4, the Contractor

CCDC41-2020 INSURANCE REQUIREMENTS

.1 Delete paragraph 1 and replace with new paragraph 1:

General liability insurance shall be with limits of not less than ten million (\$10,000,000) per occurrence, an aggregate limit of not less than \$10,000,000 within any policy year with respect to completed operations, and a deductible not exceeding \$10,000. To achieve the desired limit, umbrella or excess liability insurance may be used. Subject to satisfactory proof of financial capability by the Contractor, the Owner may agree to increase the deductible amounts.

.2 Delete paragraph 2 and replace with new paragraph 2:

Automobile liability insurance in respect of vehicles that are required by law to be insured under a contract by a Motor Vehicle Liability Policy, shall have limits of not less than two million (\$2,000,000) inclusive per occurrence for bodily injury, death and damage to property, covering all vehicles owned or leased by the Contractor. Where the policy has been issued pursuant to a government-operated automobile insurance system, the Contractor shall provide the Owner with confirmation of automobile insurance coverage for all automobiles registered in the name of the Contractor.

.3 Delete paragraphs 3 through 8.

END OF SECTION - 00 73 00

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PART 1 - GENERAL

1.1 DEFINITIONS

- .1 "Contractor", or pronoun in place thereof, means individual, group, corporation identified in the Agreement that has undertaken to perform the Work of the Contract.
- .2 "Consultant" means Rimkus Consulting Group Canada Inc., entity engaged by Owner to prepare Contract Documents and provide administration of Contract.
- .3 "Day" means a single calendar day. "Working Day" means a day other than Saturday, Sunday, and holidays which are observed by construction industry at Place of the Work.
- .4 "Owner" means City of Toronto, person or entity identified as such in Agreement.
- .5 "Owner's Representative" means authorized individual or group, other than Consultant, acting on behalf of Owner.
- .6 "Provide" means to supply and install designated Products by Contractor or Subcontractor to form a part or parts of the Work.
- .7 "Subcontractor" includes any person, firm, or corporation having a contract for performance of a part or parts of Work included in Contract, or a person, firm, or corporation furnishing material called for in Contract and worked to special design according to Contract Documents, but does not include one who merely furnishes materials not so worked.

1.2 DOCUMENTS AT SITE

- .1 Maintain and keep at least one copy of current Contract Documents in good order at Place of the Work, available to Owner and Consultant, including:
 - .1 Issued Specifications and Drawings.
 - .2 Issued Addenda.
 - .3 Shop Drawings.
 - .4 Approved Work Schedule.
 - .5 Applicable Construction and Building Permits.
 - .6 Change Orders and Change Directives.
 - .7 Supplemental Instructions or Field Orders.
 - .8 Other modifications to Contract.
 - .9 Field Observations and Testing Reports.

1.3 FEES, TAXES, PERMITS AND CERTIFICATES

- .1 Pay applicable Federal, Provincial, and Municipal taxes.
- .2 Provide authorities having jurisdiction with information when and as requested.
- .3 Pay fees and obtain certificates and permits including building permit.
- .4 Furnish certificates and permits when requested.

1.4 SAMPLES

- .1 Submit samples for review, in duplicate unless specified otherwise, as requested in respective specification Sections.
- .2 Identify name of manufacturer and product.
- .3 Deliver samples pre-paid to Consultant's business address.

- .4 Notify Consultant in writing at time of submission of deviations in samples from requirements set forth in Contract Documents.
- .5 Adjustments of samples made by Consultant are not intended to change Contract Price or Schedule. If adjustments affect value of work, state in writing to Consultant prior to proceeding with performance of work.
- .6 Make changes in and to samples as requested by Consultant, consistent with Contract Documents.
- .7 Installed work to match reviewed and approved samples.

1.5 WORK SCHEDULE

- .1 Provide initial schedule within seven (7) working days after Award of Contract, unless specified otherwise, showing anticipated progress stages and final completion of work.
- .2 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.
- .3 Coordinate all schedules with Owner's Representative and/or Consultant to suit Owner's occupancy and usage requirements.

1.6 USE OF THE WORK

- .1 Confine Construction Equipment, Temporary Work, storage of Products, waste products and debris, and operations of employees and Subcontractors to limits indicated by laws, ordinances, permits, or Contract Documents. Do not unreasonably encumber Place of the Work.
- .2 Do not load or permit to be loaded any part of the Work with a weight or force that will endanger safety or structure of the Work.
- .3 Where the Project contemplates Work by way of renovations in buildings which will be in use or be occupied during performance of the Work, or where the Project involves Work that is adjacent to a structure which is in use or is occupied, the Contractor, without limiting its responsibilities under this Contract, shall perform the Work in such a manner so as to avoid disturbing occupants of any adjacent structures or public in general, shall respect and comply with local regulations regarding permitted work hours, noise levels and work conditions, and shall take all reasonable steps to avoid interference with fire exits, building access and egress, continuity of electric power and all other utilities, to suppress dust and noise, to avoid conditions likely to propagate mould or fungus of any kind, and all other steps reasonably necessary to promote and maintain the safety and comfort of users and occupants of such structures or adjacent structures and public in general and to maintain access to and the operation of same.
- .4 Without Owner's prior approval, do not permit any worker or Subcontractors to use any existing facilities including, without limitation, lavatories, toilets, entrances, and parking areas other than those designated by Owner for use during performance of Contract.

1.7 CONTRACTOR'S USE OF SITE

- .1 This is an occupied site and normal operations must be maintained during performance of work. Take proper care to avoid unnecessary noise, clatter or obstruction in corridors, walkways, sidewalks, and roadways. Do not interfere with use or safe passage to and from building and adjacent public sidewalks and roads. Do not unreasonably encumber site with materials or equipment. Where excessive noise or obstruction is in certain instances unavoidable, advise Owner Representative ahead of time and make suitable arrangements.

- .2 Hours of Work:
 - .1 **Working times must be coordinated with Owner's Representative prior to commencement of work.**
 - .1 General: Perform Work between 7:00 AM to 6:00 PM, Monday through Friday, unless otherwise approved by Owner.
- .3 Designated Parking:
 - .1 Parking will NOT be provided on-site for use by Contractor and Subcontractors, unless specified otherwise in Instructions to Bidders or co-ordinated in advance with Owner's Representative, prior to work start.
 - .1 Contactor and Subcontractors to make arrangements at own expense for parking, including all applications and payments for necessary permits and parking fees.
 - .2 Observe and comply with local parking restrictions around Place of the Work.
- .4 Access:
 - .1 Access and egress from work site to be as per prescribed and designated routes only. Provide and arrange for traffic control where necessary for delivery of materials, removal of garbage, etc. as required by Owner's Representative and as required by laws, ordinances, rules and regulations relating to Place of Work.
 - .2 Ensure that privileges presently accruing to adjacent properties are maintained.
 - .3 Do not transport materials through building without prior approval from Owner's Representative. Access to building and elevators, storage space for material and tools will be as specified by Owner's Representative.
- .5 Storage:
 - .1 Use of site for storage of materials and equipment will be at a location acceptable to Owner's Representative. Location of site storage provision for removal of debris must be coordinated with Owner and Consultant in advance. Obtain and pay for use of additional storage of work areas needed for operations.
 - .2 Do not store materials or use trucks, cranes, hoists or other equipment in a manner which would load existing building structure beyond its design capacity.
 - .3 Provide adequate weather tight sheds or trailers for storage of materials, tools, and equipment which are subject to damage by weather.
 - .4 Move stored products or equipment which interfere with operations of Owner or other Contractors.
- .6 Sanitary Facilities:
 - .1 Provide on-site washroom facilities on ground level only. Contractor will not have access to building washroom facilities.
 - .2 Maintain Contractor's facilities in good and clean working condition.
 - .3 Workers will not be permitted to use any other sanitary facilities, intended for use of public or building personnel.

.7 Signage:

- .1 No signs or advertisements other than warning signs are permitted on site unless approved by Owner's Representative or Consultant.

1.8 COORDINATION AND COOPERATION

- .1 Coordinate all construction work with Owner's Representative and Consultant to obtain access to work site areas.
- .2 Coordinate all construction work with Sub-Contractors when work is related.
- .3 Adhere to approved project schedule as closely as possible so that proper pre-arranged access can be arranged.
- .4 Execute work with minimum disturbance to occupants, public and normal use of site and building.
- .5 Maintain access to building and exits.
- .6 Where security has been reduced by work of contract, provide temporary means to maintain security.

1.9 PROJECT MEETINGS

- .1 Hold project meetings as requested by Owner's Representative and/or Consultant.
- .2 Notify all concerned parties of meetings.
- .3 Record meetings and distribute to all parties within 3 days of meeting. Include in minutes all significant proceedings, decisions and identify action by appropriate party.

1.10 SETTING OUT OF 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.
- .3 Supply such devices as straight edges and templates required to facilitate Consultant's observation of work.

1.11 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 building operations and 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 Provide 48 hours notice and submit schedule to, and obtain approval from, Owner's Representative and Consultant 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 Owner's Representative and Consultant and confirm findings in writing.
- .5 Record locations of maintained, re-routed and abandoned service lines.

1.12 PERFORMANCE OF WORK

- .1 Perform Work with least possible interference or disturbance to occupants, public and normal use of premises, roadways, parking areas, sidewalks, alleys, or passageways. Arrange with Consultant to facilitate execution of work. **All egress doors providing access to work areas to be controlled. This to be coordinated with Owner's Representative.**
- .2 Provide all protection necessary or as required by local by-laws including but not limited to: hoarding, covered walkways, guard rails, barriers, night lights, sidewalk or curb protection and warning notices in locations where renovation and alteration work is adjacent to areas used by building occupants or public.
- .3 Take all necessary precautions to keep dust, dirt, and debris to an acceptable level as directed by Owner's Representative and Consultant. Comply with all laws, ordinances, rules and regulations relating to work in connection with above.
- .4 Where work is performed adjacent to air intakes, Owner's Representative and Consultant must be notified so that appropriate measures can be taken.
- .5 Protect exterior surfaces of building and grounds from debris and damage.
- .6 Protect adjacent property and buildings against damage which may occur as a result of work. Make good, to satisfaction of Owner's Representative and Consultant, any damage resulting from work of this Contract.

1.13 WASTE DISPOSAL

- .1 Provide for storage and removal of garbage as a result of work and obtain approval of storage location from Owner's Representative and Consultant prior to commencement of work.
- .2 Disposal of debris and garbage daily with minimum disturbance to Owner and occupants.

1.14 TEMPORARY FACILITIES AND SERVICES

- .1 Provide and maintain temporary facilities to carry out work.
- .2 Provide and maintain sanitary facilities to be used by Contractor's forces.
- .3 Remove temporary facilities and services on completion of work.

1.15 EQUIPMENT, HOISTING AND SAFETY

- .1 Provide all required hoisting equipment for removal of debris and for movement and placing of materials and equipment during construction. Debris chutes to be totally enclosed and inclined, with watering down facilities as necessary to control dust, fire hazards, and nuisance factors. Exercise extreme care in disposal of wash water.
- .2 Any damage caused by hoisting equipment or operator to be made good to satisfaction of Owner's Representative and Consultant.
- .3 Provide and maintain temporary ladders required to perform work. Ladders to be strongly constructed and to comply with all requirements of safety authorities having jurisdiction over work. All ladders to be secured and used only by methods approved by Authorities.
- .4 Provide all required scaffolding necessary to perform work. Erect scaffolding independent of walls. Construct, maintain and use scaffolding in accordance with CAN/CSA-S269.2M - Access Scaffolding for Construction Purposes.

1.16 LOCATION OF EQUIPMENT AND FIXTURES

- .1 Location of equipment, fixtures and outlets indicated or specified are to be considered as approximate.
- .2 Locate equipment, fixtures and distribution systems to provide minimum interference and maximum usable space and in accordance with manufacturer's recommendations for safety, access and maintenance.
- .3 Inform Consultant of impeding installation and obtain approval for actual location.
- .4 Submit field drawings to indicate relative position of various services and equipment when required by Consultant.

1.17 FIRE PREVENTION

- .1 No open burning to be permitted within any construction at site.
- .2 Provide and maintain temporary fire protection equipment during performance of work required by insurance companies having jurisdiction and governing codes, regulations, and bylaws. Provide a 20 lb. dry chemical fire extinguisher fully charged and in operable condition at every location where open flames are used.
- .3 Keep site free of waste materials, rubbish, and debris.

1.18 CUTTING, FITTING, AND REMEDIAL WORK

- .1 Perform cutting, fitting, and remedial work required to make affected parts of the Work come together properly.
- .2 Co-ordinate the Work to ensure that cutting and remedial work is kept to a minimum.
- .3 Where new work connects with existing and where existing work is altered, cut, patch and make good to match existing work.
- .4 Obtain Consultant's approval before cutting, boring or sleeving load-bearing members.
- .5 Cutting and remedial work to be performed by specialists familiar with Products affected and be performed in a manner to neither damage nor endanger the Work.
- .6 Make cuts with clean, true, smooth edges. Make patches inconspicuous in final assembly.
- .7 Fit work airtight to pipes, sleeves, ducts, and conduits.

1.19 WELDING AND CUTTING

- .1 Safety Provisions
 - .1 Ensure compliance with following regulations regarding welding and cutting operations and other operations generating flames, sparks, smoke, and heat;
 - .1 Prior to commencement of welding/cutting/torching operations confirm with Consultant or Owner's Representative.
 - .2 Provide as a minimum a Type ABC 20lb, dry chemical fire extinguisher and a small hose at all welding, cutting and torching locations. Ensure a knowledgeable operator trained in its use is provided at all times.
- .2 Safety Procedures by Contractor

- .1 Clear area in immediate vicinity of welding, cutting and torching locations as much as possible of combustible materials and refuse and obstacles to operations.
- .2 Cover or protected with a non-combustible material all combustible materials which cannot be removed to satisfaction of Consultant and Owner's Representative. Provide shielding to prevent spread of sparks and molten metal from welding, cutting and torching operations.
- .3 Shield or otherwise protect sprinkler heads, smoke and heat detectors from any welding, cutting and torching operations. If it is likely that shielding will not prevent activation of any of these devices, it to be necessary to have affected fire protection zones(s) isolated for duration of any of operation.

1.20 SMOKING RESTRICTION

- .1 No Smoking Policy: Smoking and vaping are strictly prohibited at project worksite; on rooftop and at related staging and storage areas.
 - .1 Comply with Owner's additional smoking restrictions for site and premises.
 - .2 Smoking and vaping are defined as including cigarettes, cigars, pipes, e-cigarettes, and other equipment used to smoke or burn tobacco, cannabis, and other plant material.

1.21 OCCUPATIONAL HEALTH AND SAFETY

- .1 Conform to safe work practices in accordance with regulations and authorities having jurisdiction.
- .2 Promptly report to Owner and Consultant all accidents or if any claim is made against Contractor or Subcontractor on account of accident.
- .3 Provide at site, equipment to supply first aid.
- .4 Enforce proper work methods and act immediately on directions regarding safety and work practices given by authorities having jurisdiction or Owner, at no additional cost to Owner.
- .5 Failure to comply with verbal or written instructions or orders from Ministry of Labour inspector or other authorities as well as Owner or Consultant regarding safe work practices or provision of specified requirements under Act to be considered non-compliance with Contract.
- .6 Maintain on-site a copy of latest edition of Occupational Health and Safety Act and Regulations for Construction Projects.
- .7 Ensure that all personnel are adequately equipped to comply with safety regulations and that sufficient safety equipment is available.

1.22 TEMPORARY POWER AND WATER

- .1 Coordinate with Consultant and Owner's Representative for use of temporary power and water supply.
- .2 Provide any necessary special wiring for lights, equipment, etc.
- .3 Owner will pay for all utility charges.
- .4 Temporary power distribution wiring to comply with provincial Hydro Electrical Safety Code. Obtain inspection certificates for temporary electrical work from local authorities.

1.23 WORKPLACE HAZARDOUS MATERIALS INFORMATION SYSTEM (WHMIS)

- .1 Contractor to be familiar with WHMIS regulations and be responsible for compliance.
- .2 Controlled products to be properly labeled.
- .3 Provide proper warning labels and training at workplace.
- .4 Provide copies of Safety Data Sheets (SDS) for any controlled product in workplace.
- .5 Be responsible for all other requirements of regulations as applicable to Employers.
- .6 Contractor shall, before commencing work, provide Owner with a proposal as to how hazardous materials will be stored and dispensed on-site. Specifically outline measures to be taken to prevent damage or injury in event of an accidental spill.

1.24 CLEANUP

- .1 Contractor's parking areas, storage areas, and access routes between work areas and aforementioned areas to be as defined by Owner's Representative and be strictly adhered to.
- .2 Maintain project free of accumulated waste and rubbish. Disposal of debris and garbage to be on a per shift basis with minimum disturbance to Owner and tenants. Under no circumstances shall debris be allowed to accumulate on-site.
- .3 Maintain the Work in a safe and tidy condition and free from accumulation of waste products and debris, other than that caused by Owner, Other Contractors, or their employees.
- .4 Before applying for Substantial Performance of the Work, remove waste products and debris, other than that resulting from work of Owner, Other Contractors, or their employees, and leave Place of the Work clean and suitable for use or occupancy by Owner.
- .5 Remove Products, tools, Construction Equipment, and Temporary Work not required for remaining performance of the Work.
- .6 Prior to application for the final payment, remove any remaining Products, tools, Construction Equipment, Temporary Work, waste products and debris, other than those resulting from work of Owner, Other Contractors, or their employees.
- .7 Final cleaning:
 - .1 Remove temporary protection.
 - .2 Remove dust, dirt, and foreign matter from surfaces.
 - .3 Broom clean paved exterior surfaces.
- .8 At end of project, landscaping to be repaired to match pre-existing conditions to satisfaction of Owner's Representative and Consultant.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION - 01 00 00

PART 1 - GENERAL

1.1 DESCRIPTION

- .1 Roofing Contractor to provide all labour, plant, equipment, and materials necessary to perform to completion Work as described in these Contract Documents for:
 - .1 Roof Rehabilitation Program on designated roof areas at William Bolton Arena located at 40 Rossmore Road, Toronto, Ontario, M6G 2M7.
- .2 Contract Documents to be reviewed in their entirety with all sections, including Division 1-General Requirements, to be considered interrelated and form part of this section.

1.2 PROJECT SCHEDULE

- .1 Owner requires that work of this contract be completed as quickly as possible. Consideration will be given to time required for total performance of specified work during review of submitted Bids.
 - .1 Submit with Bid a detailed bar diagram schedule of Work, detailing start and completion dates for various items of work necessary to perform contract to Total Completion.
 - .2 Total Completion of Work to be completed by a specified date; to be announced later in consultation with Contractor.

1.3 EXAMINATION OF DRAWINGS, SPECIFICATIONS, AND WORKSITE

- .1 Carefully examine and study, as indicated in Instructions to Bidders, all Bid Requirements together with existing site conditions and any other necessary data or conditions that may affect performance of Work in order to determine full extent of Work.

1.4 BID PRICING

- .1 Provide a Stipulated Lump Sum Price on Bid Form to perform all Work described in this Summary of Work, its related technical specification sections, and as shown on drawings.
- .2 Base Bid Pricing: Provide a breakdown of Stipulated Lump Sum Price as itemized and indicated on Bid Form under Appendix "C" - Stipulated Price Breakdown.
 - .1 Low Slope Roof Replacement: Price to perform specified new roof replacement work over existing prepared roof deck on Roof Areas 1.1 and 2.1 with a two (2) ply modified bitumen membrane system at 2% Slope (Max. 10.0" of Insulation), and a ten (10) year System Warranty, to Section 07 52 16.
 - .1 Heat Tracing Cable System: Lump Sum Price to supply, install, and test new heat tracing cable system, inside of building install on existing roof drain piping from Roof Area 2.1.
 - .1 Price to include for scissor lifts to access heat tracing cables.
 - .2 Replace Existing Roof Hatch & Ladder: Include in Price to supply and install new metal, roof access hatch with related collapsible or folding interior roof access ladder at existing hatch location.
 - .3 Interior Protection: Lump Sum Price to supply and install new temporary, under-deck, interior dust protection during performance of Work at sections related to corresponding roof replacement work above. Protection to be executed in phases as roof work is performed.

- .2 Elastomeric Wall Coating: Lump Sum Price to supply and install over prepared metal cladding panels, a new liquid applied elastomeric roof coating on Wall Areas to Section 07 56 00.
 - .1 Price to include for all scaffolding, scissor lifts, bucket trucks, swing-stages, and all temporary safety and fall arrest required to perform specified work. Include for tarpauling and protection of adjacent areas from spills and overspray.
 - .2 Price to include for preparation of existing metal surfaces; including cleaning of stains, re-securing fasteners, replacing missing fasteners, sealing gaps and joints, installing new metal closures, and installing new metal flashings where required due to significant corrosion.
 - .3 Price to include for removal of existing sealants and caulking on metal wall cladding areas and provision of new sealants compatible with coating.
- .3 Asbestos Removal: Lump Sum Price to remove and dispose all of identified asbestos containing materials from wall cladding areas in accordance with summary from Hazardous Building Materials Assessment report No. T-151750 by AGAT Laboratories Inc. and prepared for City of Toronto.
- .3 Separate Pricing: Items to be awarded and performed, at Owner's discretion, in conjunction with specified Stipulated Price Work, and not by themselves. Do not include in Separate Price Items standard project setup and staging costs covered elsewhere.
 - .1 New Guard Rail Installation: Lump Sum Price to supply and install 1.98m (6'-6") wide section of new freestanding, self ballasted guard railing on either side of mechanical unit, close to exterior roof edge on Roof Area 1.1. Fall protection railing system using modular pipe railings, upright post, weighted bases, and all required accessories for complete installation.
 - .1 Railing design to be engineered for specific project, in accordance with OBC 2012. Provide engineered shop drawings to Consultant for review prior to fabrication and installation.
 - .2 Include for installation of additional squares of granular modified bitumen cap sheet membrane as a protection pad underneath every counterbalance weight and main upright base plate.
- .4 Unit Pricing: Items to be performed as required and reviewed by Consultant where exposed during performance of Work or where directed on site by Consultant, and added to Contract Price.
 - .1 Interior Protection: Price to add to Contract for supply and installation of new temporary, under-deck, interior dust protection per square foot during performance of Work at sections related to corresponding roof work above.
 - .2 Existing Metal Deck Rust Painting: Price to add to Contract to clean and prepare exposed metal surfaces to be treated with rust inhibiting paint, including supply and installation of new rust inhibiting primer coat and two finish coats of paint where reviewed by Observer, per square foot.
 - .3 Existing Metal Deck Replacement: Price to add to Contract to supply and install new galvanized metal decking as required to replace damaged or severely corroded sections of existing deck with new material of matching size and profile paint per square foot. Replacement of metal deck sections to be reviewed by Observer.

- .1 Include in Price to provide appropriate interior protection, hoarding, and warning systems during performance of deck replacement.
- .4 Existing Wood Deck Replacement: Price to add to Contract to supply and install new wood decking to match existing, in size and configuration, per square foot. Replacement of new wood decking to be reviewed by Observer.
 - .1 Include in Price to provide appropriate interior protection, hoarding, and warning systems during performance of deck replacement.
- .5 Existing Plywood Sheathing Replacement: Price to add to Contract to supply and install new matching plywood sheathing along vertical transitions at perimeters, walls, and curbs as required to replace damaged, wet, or deteriorated existing plywood sheathing, per square foot. Replacement of plywood sheathing to be reviewed by Observer.
- .6 Existing Wood Block Replacement: Price to add to Contract to supply and install new matching wood blocking at perimeters, walls, and curbs as required to replace damaged, wet, or deteriorated existing wood blocking, per board foot. Replacement of wood blocking to be reviewed by Observer.
- .7 New Guard Rail Installation: Price to add to Contract to supply and install 2.44m (8'-0") wide section of new freestanding, self ballasted guard railing at HVAC unit close to exterior roof edge. Fall protection railing system using modular pipe railings, upright post, weighted bases, and all required accessories for complete installation.
 - .1 Railing design to be engineered for specific project, in accordance with OBC 2012. Provide engineered shop drawings to Consultant for review prior to fabrication and installation.
 - .2 Include for installation of additional squares of granular modified bitumen cap sheet membrane as a protection pad underneath every counterbalance weight and main upright base plate.

1.5 OWNER OCCUPANCY

- .1 Owner will occupy premises during entire construction period for execution of normal operations.
- .2 Cooperate with Owner in scheduling operations to minimize conflict and to facilitate Owner usage.

1.6 CONTRACTOR USE OF PREMISES

- .1 Contractor to limit use of premises for Work, for storage, and access.
- .2 Coordinate use of premises under direction of Owner and Consultant.
- .3 Obtain and pay for use of additional storage or work areas needed for operations under this Contract.

1.7 GENERAL SITE REQUIREMENTS

- .1 Temporary Barriers, enclosures and signage will be highly enforced given use of property.
- .2 Contractor to ensure safety and proper execution of public routing; ensuring temporary access to fire exits if and when they are affected as part of Work.
- .3 Obtain Construction/Building Permit and sidewalk/roadway occupation permits as required by local municipality.

- .4 Determine nature and extent of all site services above and below grade prior to commencement of Work.
- .5 Coordination of trades will be responsibility of Contractor to ensure work is completed as soon as possible. Provide winter protection and heating as required to perform Work if required and as specified.
- .6 Supply, set-up, maintain and remove scaffolding, man-lift platforms and/or swing-stages during performance of Work as required to access work areas. If scaffolding is to be used, Contractor to provide complete shop drawings bearing seal of a Professional Engineer, licensed to practice in Place of Work. Work to include review and approval of installed scaffolding by Designer. Allowance should be made for access to all elevations of building.
- .7 No public access to Work area to be allowed. Ensure access to fire exits are maintained and hoarded through Work area. Pedestrian access along sidewalks must be maintained as per Owner's requirements. No areas of access to or around building are to be restricted without approval of Owner.
- .8 Install temporary protection at all locations of Work, as required to ensure safe, clean, orderly removal and disposal work, and to provide protection for all interior and exterior building components, vehicles, pedestrians and occupants.
- .9 Provide temporary support to existing structural and cladding components during performance of work if required.
- .10 Install temporary protection for all materials and building components, which have been exposed during demolition/removals as specified.
- .11 Dispose of all materials at landfill site authorized by authorities having jurisdiction.
- .12 Scissor lift is required for installation of new heat tracing system.
- .13 Maintain access ramp located adjacent to staging area, in order to provide accessibility to the double door principal access to the dance studio.
- .14 Maintain laneway access between William Bolton Arena and St.Alban BGC. This laneway serves as principal access to the dance studio. Laneway will require to be protected since studio operates throughout the year.
- .15 Provide flagman on the laneway, serving as construction access route to staging area and the site, to ensure safety during removal of debris from site, and delivery of construction material.

1.8 SITE SPECIFIC REQUIREMENTS

- .1 Mechanical Equipment Disconnections: Disconnection and reconnection work required at existing rooftop mechanical equipment to facilitate new roof installation to be performed as quickly as possible to minimize disruptions to building occupants.
 - .1 Coordinate and plan required disruptions in advance with Owner's representative.
- .2 Building Access: Set up and staging area to be in South Side parking lot of building, at approximate location shown on roof plan.
 - .1 West Side of building to be accessible to building next door.
 - .2 Lane way at South side of building not to be blocked.

1.9 PROTECTION OF ROOFS

- .1 Protect existing roof systems from possible damage during performance of work required by this contract, including transportation across existing roof areas.
- .2 Provide protection within area of work where materials, equipment, or heavy tools are placed on or transported across roof surface.
- .3 Protection to consist of:
 - .1 Supply and loose lay a continuous layer of clean 6 mil polyethylene slip sheet over existing roof system. Slip sheet to be a minimum 2.44m (8'-0") wide with minimum 457mm (1'-6") overlaps at end joints.
 - .2 Supply and loose lay a continuous layer of minimum 25mm (1.0") thick, clean extruded polystyrene insulation centered over polyethylene slip sheet.
 - .3 Supply and loose lay a continuous layer of minimum 13mm (0.5") thick, clean plywood sheathing.
- .4 Provide additional protection over newly installed roof sections where required for temporary storage or transportation of materials, equipment, or heavy tools.

1.10 SCOPE OF WORK: INTERIOR PROTECTION

- .1 Interior Protection: Provide new temporary, under-deck, interior dust protection during performance of Work at sections related to corresponding roof replacement or retrofit work above. Protection to be executed in phases as work is performed.
 - .1 Full Roof Replacement:
 - .1 Where entire existing roof system is removed down to existing roof deck or vapour retarder for installation of a full new roof system, complete Interior Protection is required across entire inside area of facility.
 - .2 Include costs associated with complete Interior Protection in Bid Pricing.
 - .2 Interior Protection Requirements:
 - .1 Protect all areas including, but not limited to, fresh produce, fresh meat, seafood, deli, food preparation stations, back rooms, lunch rooms and around openings in roof deck.
 - .1 Interior Protection requirement is waived at all areas with existing drop ceiling or suspended ceiling tiles.
 - .2 Install new, clean, clear plastic tarpaulins with plastic zip-ties and tape as required to designated protection areas under exposed roof decking.
 - .1 Install tarps safely around lights and sprinkler heads without obstructing or interfering with their normal operation.
 - .2 Check performance of under-deck protection periodically during performance of roof work to ensure its adequacy and function.
 - .3 Carefully remove temporary protection at conclusion of work, dispose of any accumulated debris, and avoid dust contamination to interior during tarp removal.

- .4 All setup and removal work to be done without disruption to building operations and occupants. Coordinate scheduling of protection work with Owner's on-site representatives to minimize impact on facility's normal operations.

1.11 SCOPE OF WORK: LOW SLOPE ROOF REPLACEMENT

- .1 On Roof Areas 1.1 and 2.1: Remove existing roof system components, projection and perimeter flashings, and old appurtenances down to existing roof deck in preparation for installation of a new roof system. Replacement Work to be in accordance with Section 07 52 16.
 - .1 On Metal Deck Area: Remove existing roof system down to existing metal roof deck surface and dispose of debris to an appropriate site.
 - .1 Clean dust and debris from flutes of existing roof deck with broom or vacuum.
 - .2 Examine and review surface of exposed metal deck for corrosion and deterioration that may impact roof system installation. Repair or rust paint corroded metal decking as required.
 - .2 On Wood Deck Area: Review surface of exposed wood deck for wet, damaged, or deteriorated sections needing to be replaced before proceeding with roof installation. Damaged wood deck sections to be cut out in logical rectangular sections centered over supporting joists and framing.
 - .1 Remove existing electrical heat trace cable on Roof Area 2.1.
 - .3 Install new electrical heat trace system, inside of building at drain pipes, beneath Roof Area 2.1.
 - .4 Install new control joint on Roof Area 2.1, where indicated on Roof Plan.
 - .5 Adjust existing hanging conduit supports and gasline support system, to accommodate increased insulation height, on Roof Area 1.1.
 - .1 Support existing conduit piping during reroof.
 - .6 On Roof Area 1.1: Install a layer of 13mm (0.5") siliconized gypsum roof board across exposed metal deck ribbons of foamable polyurethane roofing adhesive to CSA A123.21.
 - .7 On Roof Area 2.1: Mechanically fasten a layer of 13mm (0.5") siliconized gypsum roof board across exposed wood deck with fasteners and plates to CSA A123.21.
 - .1 Fasteners to not penetrate through wood deck. Fasteners to penetrate maximum 25mm (1").
 - .8 Install new wood blocking and plywood at perimeters and curbs as required to suit new increased insulation height.
 - .1 Prime all exposed wood, concrete, gypsum board, and metal surfaces where required to receive new membrane and flashings.
 - .9 Install self adhered vapour retarder field membrane across prepared, clean surface.
 - .1 Install self adhered modified bitumen base sheet flashings to vapour retarder around roof perimeters and at sleepers, curbs, and penetrations.
 - .10 Adhere a layer of flat 51mm (2.0") polyisocyanurate base insulation in ribbons of polyurethane roofing adhesive to CSA A123.21 requirements.

- .11 Adhere a layer of polyisocyanurate overlay insulation, tapered from a min. thickness of 51mm (2.0") up to 254mm (10.0") at 2%, as indicated on roof plan.
 - .1 On Roof Areas 1.1 and 2.1: Install new 2.44m x 4.88m (8'x16') or 4.88m x 4.88m (16'x16') tapered insulation drain sumps, centered around each roof drain, as indicated on roof plan.
- .12 Install a continuous flat layer of torchable cover board panels with a modified bitumen base sheet membrane in ribbons of polyurethane roofing adhesive.
 - .1 JM & Siplast Option: Install 13mm (1/2") siliconized gypsum roof board and a layer of modified bitumen base sheet membrane, self adhered.

OR
 - .2 Soprema Option: Install 7.0mm (9/32") 2-1 Soprasmart Board with factory laminated modified bitumen base sheet membrane. Self adhere and hot air seal all side laps and install modified bitumen base sheet cover strips over board panel end joints.
- .13 Install one ply of self adhered modified bitumen base sheet flashings along perimeters, curbs, projections, and where indicated on detail drawings.
- .14 Install one ply of torch applied granular modified bitumen cap sheet field membrane.
- .15 Install one ply of torch applied granular modified bitumen cap sheet flashings.
- .16 Install new prefinished sheet metal flashings and trim with required hook strips.
- .17 Install new overflow scupper drain where indicated on roof plan. Adjust scupper height to accommodate new roof insulation.
- .18 Adjust and reinstate existing ductwork on roof area 1.1 as required, to accommodate new roof installation.
- .19 Install new gas line supports and all gas lines to be painted yellow.
- .20 Scaffolding to be included within project.
- .21 All drains to be clear and free flowing at the end of the project.
- .22 New Roof Access Hatch & Grab Bar: Include in Bid Price for all costs required to supply and install a new prefab 14 ga. galvanized steel roof access hatch to suit existing roof hatch size, with a 305mm (12") high integrated galvanized steel curb to suit deck opening at existing roof hatch location on Roof Area 1.1. Standard of Acceptance to be R-100-G-SB roof access hatch by Lexcor or Rimkus approved equivalent.
 - .1 Safety Bar at Roof Hatch: Include for supply and installation of a new safety grab bar mounted to corner of hatch without impeding operation of lid. Safety Bar to be made from min. 35mm (1.38") diameter galvanized steel tubing with coloured PVC coating. Standard of Acceptance to be Safety Bar Handle by Lexcor or Rimkus approved equivalent.

1.12 SCOPE OF WORK: ELASTOMERIC COATING

- .1 On Wall Cladding Areas: Clean and prepare existing metal cladding wall system to receive installation of a new elastomeric roof coating. Roof Coating Work to be performed in accordance with Section 07 56 00. Include for approximately 3,532 sq.ft. of roof coating to be applied on metal cladding wall surfaces.

- .1 Examine and review existing exposed metal panel wall system and note problem areas requiring repair or replacement. Include review of exposed all fasteners.
 - .1 Replace significantly corroded or otherwise damaged metal wall panels with new of matching size and profile.
 - .2 Tighten loose fasteners and replace damaged or missing fasteners with new.
 - .3 Install new metal closures with butyl tape sealant and foam closures where required to close off gaps in existing metal wall panel system.
- .2 Where significantly corroded, missing, or otherwise damaged, provide new metal flashings and trim to replace existing metal flashings, drip flashings, counter flashings, closures, etc.
 - .1 Install new metal flashings where required to match existing in size and configuration where required in accordance with Section 07 62 00.
- .3 Remove and dispose of all existing sealant on metal wall panel areas to receive new coating.
 - .1 Install new coating compatible sealants in accordance with Section 07 92 00.
- .4 Clean all metal substrates to remove existing dirt, oils, and debris.
- .5 Prepare existing metal wall substrate surfaces to receive primer and coating applications.
 - .1 Lightly rusted and corroded metal areas to be sanded and prepped according to manufacturer's instructions.
 - .2 Install new seam sealer with reinforcing mesh or self adhered tape at all seams and joints.
 - .3 Install new sealer over all exposed fasteners.
- .6 Install new high build coat of acrylic elastomeric coating over prepared substrate.
- .7 Where required to achieve custom colour finish, install new top coat of acrylic paint or coating over elastomeric coating.

1.13 SCOPE OF WORK: ASBESTOS ABATEMENT & REMEDIATION

- .1 At Wall Cladding Areas: Remove and dispose all of identified asbestos containing materials in accordance with summary from Hazardous Building Materials Assessment report T-151750 by AGAT Laboratories Inc. prepared for City of Toronto
- .2 Carry all costs in Lump Sum Price associated with provision of all labour, supervision, materials, equipment, testing, and services required and essential for asbestos removal, disposal, and cleaning as per Hazardous Material Report, these Specifications, provincial Occupational Health and Safety Act, and any other applicable regulations.

1.14 SCOPE OF WORK: ROOF GUARD RAILS – FREESTANDING (SEPARATE PRICE)

- .1 On Roof Area 1.1: Include in Bid Price for supply and installation of new ballasted guard railing system 1.98m (6'-6") on either side of mechanical unit along roof perimeter on Roof Area 1.1 for approximately 6.71m (22'-0") of guard railing.
- .2 New railing system to be a freestanding fall protection system using modular pipe railings, upright post, bases, and counterweights with associated fittings and accessories.

- .1 Kee Guard Ballasted Roof Edge Guardrail by Kee Safety Inc. (Toll Free 877.505.5003),
 - .2 Modu-Guard Safety railings by Grasp Safety Services; Tel: 905.240.8900,
 - .3 PHP Safety Railings by PHP Systems design, Tel:1-877-853-5556,
 - .4 or Rimkus Group approved equivalent.
- .3 Railing system to be engineered for specific project with shop drawings and meet current codes and regulations for fall arrest including:
- .1 Guard design to be in accordance with the OBC 2012 and covering:
 - .1 OSHA Standard 29 CFR 1910.23,
 - .2 OSHA Standard 29 CFR 1926.501, 29 CFR 1926.502.
- .4 Provide engineered shop drawings to Consultant for review prior to fabrication and installation.
- .1 Shop drawings to be specific to this project and include all attachment requirements and securement details for installation into specified roof deck type.
- .5 Install uprights and counterweights in accordance with manufacturer specifications and installation instructions.
- .6 Install an additional square of granular modified bitumen cap sheet membrane as a protection pad underneath every counterbalance weight and main upright base plate.

1.15 SCOPE OF WORK: DRAINPIPE HEAT TRACING CABLE SYSTEM

- .1 Install Drainpipe Heat Tracing at Downpipes on Roof Area 2.1: Supply and install new continuous heat tracing cable system complete with all transformers, cables, and related accessories for a complete installation, inclusive of 1" minimum insulation wrap.
- .2 New heat tracing system to be self-regulating.
- .3 Heat Tracing:
 - .1 Completely remove the existing system installed at four (4) roof drains on Roof Area 2.1. Decommission the existing electrical.
 - .2 New heat tracing system to be self regulating and continuous:
 - .1 Complete engineered electrical shop drawings, showing at minimum existing drainage pipe diameters, length and connections, new electrical controls, connections to existing electrical system and layout of new heat tracing system, for existing drainage pipes from Roof Area 2.1, and submit to consultant for review.
 - .2 Heat tracing system shall be designed, manufactured and tested in accordance with CSA, UL and Canadian electrical codes.
 - .3 Where cables are carried below eight feet of a walking/skating surface, provide a three-sided metal box, secured to existing wall. It is to be elevated from the ground 51mm (2.0") and extend 2.44m (8') up. 18 gauge pre-painted metal is to be used, color to be selected by owner from standard color chart. All edges are to be hemmed and no raw edges are acceptable.
 - .4 Follow all manufacturer's written instructions for securement of cables to drain pipes, details and installation, system to include the following,

- .1 Polyolefin jacketed heating cable (8 watt/ft, 208/240V), cables to be self-regulating with maximum exposure temperature of 75 Deg C, when ambient exposure falls below -30 Deg C. Two continuous cables to be installed on each pipe, cables to be installed at 4 o'clock and 8 o'clock locations on horizontal pipes and vertical. Cables to be secured in place every 12".
- .2 Junction boxes with power kit
- .3 Splice kit/connections (where required)
- .4 Thermostat control, temperature sensors, lighted end kit
- .5 Continuous 1" insulation wrap (mineral wool or fiberglass) fully in-casing the drain pipes (full length of each pipe). Apply "Heat Tracing Caution Labels" at 10' intervals.
- .6 Acceptable manufacturers.
 - .1 Thermal Resources Management (TRM)
 - .2 Rimkus Consulting Group, Inc. approved alternate meeting the requirements listed above.
- .4 Provide minimum two (2) year manufacturer warranty.

1.16 SCOPE OF WORK: REVIEW & REPAIR OF CORRODED METAL DECK

- .1 At Exposed Metal Roof Deck: Review and examine surface of exposed metal roof deck with Consultant to determine level of deck corrosion and corrective action required.
- .2 Areas With Severe Corrosion: Roof deck that exhibits pitting, holes, and/or penetrations must be replaced with new metal decking before roof installation may proceed. Small areas may be overlayed with new metal deck of matching size and profile after painting of existing metal as described below. Large areas required engineered shop drawing to determine attachment and design load requirements.
- .3 Areas With Light to Moderate Corrosion: Where pitting of base metal does not exceeding 35% of deck thickness, metal roof deck may be cleaned, primed and painted with a two coat application.
 - .1 Clean exposed metal surfaces to be painted by removing all loose paint, rust, loose mill scale, welding slag, dirt, oil, grease and other foreign substances.
 - .2 Power vacuum and/or wipe with clean cloths, flanges, webs, and ribs clear of all dust and debris. Do not use compressed air tools. Only use leaf-type blowers with approval of Consultant.
 - .3 Protect existing building surfaces and adjacent structures from paint spatters, markings and other damage by suitable non-staining covers or masking. If damaged, clean and restore such surfaces to original condition.
 - .4 Prevent contamination of cleaned surfaces by salts, acids, alkalis, other corrosive chemicals, grease, oil, and solvents before primer coat is applied and between applications of remaining coats. Apply primer or paint as soon as possible after cleaning and before deterioration occurs.
 - .5 Sand and dust between coats as required to provide adequate adhesion for next coat and to remove visible defects.

- .6 Apply one prime coat to prepared metal roof deck areas. Primer coat to be:
 - .1 Devran 205 Epoxy Primer by ICI Devoe Coatings,
 - .2 Kem-Bond HS Rust Inhibitive Metal Primer (B50AZ8) by Sherwin Williams,
 - .3 Glid-Guard Metal Primer 4570 by Glidden,
 - .4 or Consultant approved equal to above.
- .7 Apply two finish coats to exposed deck area after primer is dry. Finish coat to be:
 - .1 Devflex 4216HP Acrylic Semi-gloss Enamel by ICI Devoe Coatings,
 - .2 Industrial Enamel (B54W101) by Sherwin Williams,
 - .3 Glid-Guard Alkyd Industrial Enamel 4550 by Glidden,
 - .4 or Consultant approved equal to above.
- .8 Apply paint by brush, roller, or airless sprayer. Conform to Manufacturer's application instructions unless specified otherwise.
- .9 Brush and Roller Application:
 - .1 Apply paint in a uniform layer using brush and/or roller of types suitable for application. Work paint into cracks, crevices and corners.
 - .2 Paint surfaces and corners not accessible to roller using brush, daubers or sheepskins. Surfaces and corners not accessible to brush, use spray, daubers and/or sheepskins.
 - .3 Brush and/or roll out runs and sags, and overlap marks. Rolled surfaces to be free of roller tracking and heavy stipple unless approved by Consultant.
 - .4 Remove runs, sags and brush marks from finished work and repaint.
- .10 Spray Application:
 - .1 Provide and maintain equipment that is suitable for intended purpose, capable of properly atomizing paint to be applied, and equipped with suitable pressure regulators and gauges.
 - .2 Keep paint ingredients properly mixed in containers during paint application either by continuous mechanical agitation or by intermittent agitation as frequently as necessary.
 - .3 Apply paint in a uniform layer, with overlapping at edges of spray pattern.
 - .4 Brush out runs and sags immediately. Use brushes to work paint into cracks, crevices and places which are not adequately painted by spray.
- .11 Apply coats of paint as a continuous film of uniform thickness. Repaint thin spots or bare areas before next coat of paint is applied.
- .12 Allow surfaces to dry and properly cure after cleaning and between subsequent coats for minimum time period as recommended by manufacturer.

1.17 CLEANING

- .1 Perform daily and final clean-up of work area and areas surrounding site.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION - 01 11 00

PART 1 - GENERAL

1.1 SECTION INCLUDES

- .1 Procedures for payment of Contract.
 - .1 Applications for Progress Payments.
 - .2 Schedule of Values.
 - .3 Draws against specified Allowances.

1.2 REFERENCES

- .1 Canadian Construction Documents Committee (CCDC):
 - .1 CCDC2-2020: Stipulated Price Contract.

1.3 SUBMITTALS

- .1 Application for Progress Payment: One written application to Consultant in accordance with Section 01 33 00 – Submittal Procedures, by courier, fax, or email requesting certification of payment and including required accompanying forms, letters, and certificates.

1.4 APPLICATIONS FOR PROGRESS PAYMENT

- .1 Date applications for payment for last day of each month and ensure amount claimed is for value of the Work performed, proportionate to Contract Price, and Products delivered to Place of the Work by that date.
- .2 Submit to Consultant at least ten (10) working days before first Application for Payment, preliminary Schedule of Values for parts of the Work aggregating total amount of Contract Price, to help facilitate Consultant's evaluation of Contractor's Applications for Payment.
- .3 Schedule to follow Contractor's breakdown of Applications for Payment.
- .4 Application for First Progress Payment to include:
 - .1 Dated and numbered invoice; indicating project name and areas included,
 - .2 Schedule of Values,
 - .3 WSIB Clearance Letter, certificate dated within ten (10) working days of invoice date.
- .5 Application for Subsequent Progress Payments up to and including penultimate to include:
 - .1 Dated and numbered invoices; indicating project name and areas included,
 - .2 Updated Schedule of Values,
 - .3 WSIB Clearance Letter, certificate dated within ten (10) working days of invoice date,
 - .4 Statutory Declaration: On form acceptable to Consultant, CCDC 9A (Prime Contractor), or 9B (Subcontractor), which ever is applicable to invoice, as a sworn statement that all accounts for labour, subcontracts, Products, Construction Equipment, and other indebtedness which may have been incurred by Contractor in performance of the Work and for which Owner might in any way be held responsible have been paid in full, except for amounts properly retained as a Holdback or as an identified amount in dispute.
- .6 Application for Final Progress Payment to include:
 - .1 Dated and numbered invoice; indicating project name and areas included,
 - .2 Updated Schedule of Values,
 - .3 WSIB Clearance Letter, certificate dated within ten (10) working days of invoice date,

- .4 Statutory Declaration: On form acceptable to Consultant, CCDC 9A (Prime Contractor), or 9B (Subcontractor), which ever is applicable to invoice, as a sworn statement that all accounts for labour, subcontracts, Products, Construction Equipment, and other indebtedness which may have been incurred by Contractor in performance of Work and for which Owner might in any way be held responsible have been paid in full, except for amounts properly retained as a Holdback or as an identified amount in dispute.
- .1 Statutory Declaration must clearly state that it is for Total Performance of Work and subsequent release of Holdback.

1.5 ALLOWANCES

- .1 Any allowances that are drawn upon during progress or final payment to include:
- .1 Attach qualifying invoices supplied to Contractor to Application for Payment. If invoices are not attached, any claim on Contractor's Application for Payment to be deducted from Consultant's Certificate of Payment.
- .2 Allowance breakdowns to be included as part of Schedule of Values.

PART 2 - PRODUCTS

- .1 Sample of minimum information required for submitted Schedule of Values:

SCHEDULE OF VALUES					
Project Name:				Application Date:	
Project Address:				Progress Draw No.:	
IRC Project No.:				Client Project No.:	
Description	Contract Value	Previously Invoiced	Remainder to Invoice	Current Percent Completed	Invoice Amount This Period
(A)	(B)	(C)	(B - C)	(E)	(B * E) – C
Mobilization:	\$	\$	\$	%	\$
Insurance:	\$	\$	\$	%	\$
Bonding:	\$	\$	\$	%	\$
Warranty:	\$	\$	\$	%	\$
Change Order No.1:	\$	\$	\$	%	\$
Roof Demolition/Disposal:	\$	\$	\$	%	\$
Roofing Material:	\$	\$	\$	%	\$
Roofing Labour:	\$	\$	\$	%	\$
Sheet Metal Material:	\$	\$	\$	%	\$
Sheet Metal Labour:	\$	\$	\$	%	\$
De-mobilization:	\$	\$	\$	%	\$
Allowance:	\$	\$	\$	%	\$
	\$	\$	\$	%	\$
Totals:	\$	\$	\$	%	\$

PART 3 - EXECUTION

3.1 NOT USED.

END OF SECTION - 01 29 00

PART 1 - GENERAL

1.1 SECTION INCLUDES

- .1 This section details procedures to be followed for delivery of Submittals identified and required by other specification sections, consisting of but not limited to:
 - .1 Shop Drawings.
 - .2 Samples.
 - .3 Mock-ups.
 - .4 Certificates and transcripts.

1.2 GENERAL REQUIREMENTS

- .1 Transmittal for Submissions: Accompany all submittals with transmittal letter containing:
 - .1 Date of transmittal,
 - .2 Sequential number for tracking of each submission,
 - .3 Project title and number,
 - .4 Identification and quantity of each shop drawing, product data sheet, sample, etc,
 - .5 Contractor's business name and address,
 - .6 Name of reviewer for Contractor,
 - .7 Contractor's review stamp: completed, dated, and signed certifying submittal has been reviewed, checked, and approved for compliance with Contract documents.
- .2 Delivery: Direct submittals identified and required by individual technical sections to Consultant for review at following address, unless otherwise directed in writing:
 - .1 Attention: Marco Merolle
Office: RIMKUS CONSULTING GROUP CANADA Inc.
Address: 2121 Argentia Road, 4th Floor, Mississauga, Ontario, L5N 2X4

Telephone: 905.607.7244
Facsimile: 905.607.7288
Email: mmerolle@rimkus.com
 - .2 All deliveries prepaid by Contractor.
- .3 Time and Scheduling:
 - .1 Deliver submittals with reasonable promptness and in orderly sequence to avoid delay in progress of Work.
 - .2 Allow up to ten (10) working days for Consultant's review of each submission.
 - .3 Time for review to begin and be noted upon receipt of submittal by Consultant.
 - .4 No adjustments to Contract Time or Price allowed due to delay in progress of Work caused by review, rejection, and re-submission process.
- .4 Deviations from Contract Requirements: Notify Consultant in writing of any deviations from Contract Document requirements and state reasons for said deviations at time of submission:
 - .1 Contractor is responsible for errors and omissions in submission and is not relieved by Consultant's review.
 - .2 Contractor is responsible for deviations in submission from requirements of Contract Documents and is not relieved by Consultant's review.

- .5 Review Before Delivery: Contractor to:
 - .1 Review each submittal for completeness and compliance with Contract Documents.
 - .2 Ensure that necessary requirements have been determined and verified, or will be, and that each submittal has been checked and coordinated with requirements of Work.
 - .3 Verify co-ordination of field measurements and affected adjacent Work.
- .6 Incomplete Submissions:
 - .1 Entire submission package to be returned to Contractor if deemed incomplete during a preliminary review, for reasons including:
 - .1 Insufficient number of copies provided,
 - .2 Transmittal for submission incomplete, missing, or unsigned,
 - .3 Submittal not stamped, completed, signed, dated, and/or identified to specific project.
- .7 Re-submissions:
 - .1 Use same procedure indicated here and above for re-submission.
 - .2 Clearly identify each correction or change made to submittal.
 - .3 Use original submittal number with appended suffix at end to indicate revision number.
- .8 Acceptance and Rejection:
 - .1 Where review by Consultant discovers no errors and omissions or only minor corrections, min. two (2) copies to be returned for fabrication and installation of Work to proceed.
 - .1 One copy of accepted submission to be retained by Consultant for project record.
 - .2 If submittals are rejected or require significant modification, noted copies to be returned to Contractor and marked with request for correction and re-submittal.
 - .1 One copy of rejected submission to be retained by Consultant for project record.
 - .3 Re-submit corrected submittals using same procedure indicated above and listed in this section. Include required number of copies for subsequent re-submission.
- .9 Distribution:
 - .1 Proceed with Work affected by submittals only after Consultant's review is complete.
 - .2 Distribute copies of accepted submittals as required. Deliver one copy to Owner or Owner's Representative for project management.
 - .3 Keep one copy of each reviewed submittal on site during performance of Work.

1.3 ACTION SUBMITTALS

- .1 Shop Drawings:
 - .1 Definition: "Shop Drawings" to mean drawings, diagrams, illustrations, schedules, performance charts, brochures and other data to illustrate details of a portion of Work.

- .2 Number of Copies: Submit three (3) copies of shop drawings for each requirement identified and requested in technical sections, and as many additional copies as Consultant may reasonably request.
 - .1 Where shop drawings will not be prepared due to standardized manufacture of product, submit copies of product data sheets or brochures.
- .3 Identify and Indicate: Products and materials to be used, methods of construction, attachment or anchorage, erection diagrams, connection diagrams, explanatory notes, and any other information necessary for completion of Work.
 - .1 Where articles or equipment attach to or connect to other articles or equipment, indicate that such items have been coordinated; regardless of Section under which adjacent items to be supplied and installed. Indicate cross references to design drawings and specifications.
- .4 Drawings and Diagrams:
 - .1 Field Measurements: Note critical dimensions established by field measurement and any relationships to other critical features of Work.
 - .2 Project specific information and dimensions to be drawn accurately to scale.
 - .3 Manufacturer's Standard Drawings: Supplement standard information to provide detail specifically applicable to project. Modify to delete information not applicable to project.
 - .4 Measurements and Units: Present shop drawings, product data, samples, and mock-ups in SI Metric units. Where items or information are not produced in SI Metric units, converted values are acceptable.
- .5 Submittals to Include:
 - .1 Date and revision dates,
 - .2 Project title and number,
 - .3 Name and address of Subcontractor, Supplier, and Manufacturer,
 - .4 Contractor's stamp, signed by authorized representative certifying approval of submissions, verification of field measurements, and compliance with Contract Documents,
 - .5 Where required, licensed Engineer's signed and dated stamp or seal, valid for Place of Work,
 - .6 Details for appropriate portions of Work, as applicable including:
 - .1 Fabrication,
 - .2 Dimensioned layouts, including field dimensions and clearances,
 - .3 Setting or erection details,
 - .4 Capacities,
 - .5 Performance characteristics,
 - .6 Standards,
 - .7 Operating weight,
 - .8 Wiring diagrams,
 - .9 Single line and schematic diagrams,
 - .10 Relationship to adjacent work.

- .6 Changes and Adjustments:
 - .1 Make noted changes to shop drawings as Consultant may require, consistent with Contract Documents. When re-submitting notify Consultant in writing of any revisions other than those requested.
 - .2 Adjustments to shop drawings made by Consultant are not intended to change Contract Price. If adjustments affect value of Work, state such in writing to Consultant prior to proceeding with Work.
- .2 Samples:
 - .1 Number of Copies: Submit duplicate (2) samples for each requirement identified and requested in technical sections, and as many additional sample copies as Consultant may reasonably request.
 - .2 Identify and Indicate: Label sample's source or manufacture, material, size, model number, and intended usage in Work.
 - .3 Sample Size:
 - .1 Full size samples, cured and finished, as indicated in technical sections,
 - .2 Physically identical to product proposed for use in Work,
 - .3 Prepared from same materials and methods to be used for installation of Work.
 - .4 Mount, display, or otherwise package samples in sufficient way to facilitate review of sample for quality.
 - .5 Where colour, pattern, or texture is criterion, submit full range of samples.
 - .6 Notify Consultant in writing, at time of submission, of any deviations in samples provided from requirements of Contract Documents.
 - .7 Changes and Adjustments:
 - .1 Make noted changes to samples as Consultant may require, consistent with Contract Documents.
 - .2 Adjustments to samples made by Consultant are not intended to change Contract Price. If adjustments affect value of Work, state such in writing to Consultant prior to proceeding with Work.
 - .8 Do not proceed with any Work associated with samples until each has been reviewed and accepted by Consultant.
 - .1 Acceptance of samples to be noted in writing by Consultant.
 - .9 At least one of each accepted sample to be returned to Contractor to store on site.
 - .10 Reviewed and accepted samples to become standard of workmanship and material referenced for comparison and verification of finished Work.
- .3 Mock-ups:
 - .1 Erect sample mock-ups for each requirement identified and requested in technical sections, and as requested by Consultant.
 - .2 Mock-ups to be full scale and in section sizes as identified in technical section or as requested by Consultant.

- .3 Coordinate location for on site installation of mock-ups with Consultant.
- .4 Deliver one submittal letter noting completion of mock-up installation and requesting on site review by Consultant.
- .5 Do not proceed with any Work associated with mock-up until it has been reviewed and accepted by Consultant.
 - .1 Acceptance of mock-ups to be noted in writing by Consultant.
- .6 Accepted mock-up to constitute minimum project standard of workmanship and material to be maintained throughout performance of Work.
- .7 Maintain and protect mock-ups on site during progress of Work as reference for comparison and verification of finished Work.
 - .1 Any Work completed after review not meeting mock-up standard to be removed and reinstalled, at Consultant's discretion, with new materials at no additional cost to Owner.
- .8 Awarded Contractor will be responsible to submit closeout documents including actual values in the format requested by RioCan covering as applicable;
 - .1 Regional Content
 - .2 Recycled Content (new material / waste)
 - .3 R-Value
- .9 Awarded Contractor responsible for submitting the following:
 - .1 Prepare "Construction Management Plan" package and provide to RioCan Ops teams, Capex Rep no less than 5 weeks prior to construction start. Including;
 - .1 List of potential disruptions to site operations during work
 - .2 Consultant to offer examples to contractor, to include but not limited to;
 - .1 Tenant entrance disruptions
 - .2 Utility conflicts
 - .2 Project Schedule
 - .3 PDF site plan from tender document marked up to show components, including but not limited to;
 - .1 Staging Area
 - .2 Phasing of work c/w dates aligned with overall schedule
 - .4 Project Contact List
 - .1 24 hr emergency contact
 - .5 Completion of RioCan's "Sustainability" scorecard (revised template to be established prior to tender.

- .1 To be submitted by contractors upon substantial completion
- .2 Maintenance only scopes are exempt from this requirement

1.4 INFORMATIONAL SUBMITTALS

- .1 General:
 - .1 Number of Copies: Unless otherwise noted, submit three (3) copies for each requirement identified and requested in technical sections, and as many additional copies as Consultant may reasonably request.
- .2 Notice of Project: Provincial Ministry's official form for Place of the Work:
 - .1 Identifying Ministry of Labour or provincial equivalent,
 - .2 Identifying Contractor and Project specifics as set out in form,
 - .3 Notarized and executed by Contractor,
 - .4 Submitted to Provincial Authority in accordance with regulations.
- .3 Insurance and Bonds: True copies of transcripts for specified insurance and bonds:
 - .1 Naming Owner and Consultant as extra insured,
 - .2 Indicating amount and type of coverage,
 - .3 Notarized and executed.
- .4 Contractor's Roof System Certification:
 - .1 Letter certifying that products and materials specified in Scope of Work for Roofing and its related technical sections:
 - .1 Are compatible with each other and substrate,
 - .2 Are approved by membrane manufacturer for application and installation type,
 - .3 Meet specified warranty and system requirements,
 - .4 Achieve and meet specified FM wind uplift ratings.
 - .2 Certification letter to contain:
 - .1 Contractor's business letterhead,
 - .2 Name of representative authorized to provide certification,
 - .3 Stamp, date, and signature of authorized representative.
- .5 Manufacturer's Warranty: Full size, true copy of official warranty:
 - .1 Indicating Manufacturer's name and business address,
 - .2 With terms and conditions for specified warranty type and coverage period,
- .6 Contractor's Warranty: Full size, true copy of official warranty:
 - .1 On recognized form by provincial roofing association or one approved by Consultant,
 - .2 Indicating Contractor's name and business address,
 - .3 With terms and conditions for specified warranty type and coverage period.
- .7 Manufacturer's Instructions and Product Data Sheets (PDS):
 - .1 Published or written instructions or information documenting recommended guidelines and installation procedures in accordance with individual specification sections, including:
 - .1 Manufacturer's Name,
 - .2 Product name and model number,

- .3 Current and latest edition.
- .8 Manufacturer's Safety Data Sheets (SDS):
 - .1 Published or written information documenting physical and chemical characteristics of products to be installed with handling, safety, and first aid guidelines, including:
 - .1 Manufacturer's Name,
 - .2 Product name and model number,
 - .3 Current and latest edition.
- .9 Health and Safety Plan for Specific Site:
 - .1 Submit in accordance with Section 01 35 23 – Health and Safety.
- .10 Certificates: Full size, true copies indicating:
 - .1 Name and address of Issuing Authority,
 - .2 Purpose of certificate,
 - .3 Individual or company covered by issued certificate,
 - .4 Notarized and executed.
- .11 Trade or Installer Qualifications:
 - .1 Present accreditation cards or tickets, or true copy of, to Rooftop Quality Observer at start of Work and whenever Observer requests, containing:
 - .1 Name and photo of qualifying individual,
 - .2 Identification of training type or certification received,
 - .3 Date achieved or received, or expiry of certification.
- .12 Applications for Payment:
 - .1 One copy by courier, fax, or email with all required accompanying submittals and documentation in accordance with Section 01 29 00 – Payment Procedures.
- .13 Closeout Submittals:
 - .1 Upon completion and acceptance of Work, deliver copies of submittals in accordance with Section 01 77 00 – Closeout Procedures.

PART 2 - PRODUCTS

2.1 NOT USED.

PART 3 - EXECUTION

3.1 NOT USED.

END OF SECTION - 01 33 00

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PART 1 - GENERAL

1.1 DESCRIPTION

- .1 This section includes for compliance and submittals required for health and safety during Work.

1.2 REFERENCES

- .1 Federal regulations, latest edition including amendments up to project date:
 - .1 Canada Labour Code, R.S.C., 1985, c. L-2:
 - .1 Part 2, Canada Occupational Safety and Health Regulations.
 - .2 National Building Code (NBC) 2015, Division B:
 - .1 Part 8 Safety Measures at Construction and Demolition Sites.
 - .3 National Fire Code (NFC) 2015, Division B:
 - .1 Part 5 Hazardous Processes & Operations, subsection 5.6.1.3 Fire Safety Plan.
- .2 Provincial regulations for Place of Work, latest edition including amendments up to project date:
 - .1 Provincial Building Code.
 - .2 Provincial Occupational Health and Safety Act.
 - .3 Municipal statutes and authorities.
 - .1 Workplace Safety and Insurance Act, 1997.
 - .4 Ministry of Labour Published Guidelines:
 - .1 Lead on Construction Projects, April 2011.
 - .2 Silica on Construction Projects, April 2011.
 - .5 Municipal statutes and authorities.
- .3 Canadian Standards Association (CSA): Canada
 - .1 CSA S350-M1980(R2003): Code of Practice for Safety in Demolition of Structures.

1.3 SUBMITTALS

- .1 Informational Submittals:
 - .1 Notice of Project filed with Provincial Ministry of Labour or equivalent for Place of Work.
 - .2 Health and Safety Plan for Specific Work Site including, but not limited to:
 - .1 Name and contact info of Contractor's Health and Safety Representative for Work Site; including twenty-four (24) hour emergency contact phone numbers.
 - .2 Phone numbers of local fire, police, and ambulance outside of 911 services.
 - .3 Location of nearest medical facility and level of injury that each can service.

- .4 Copies of certification for all employees on site of applicable safety training including, but not limited to:
 - .1 WHMIS.
 - .2 Fall arrest and protection.
 - .3 Suspended Access Equipment.
 - .4 Erection of Scaffolding.
 - .5 License for powder actuated devices.
- .5 Safety Data Sheets (SDS) of controlled products to be used.
- .6 On-site Contingency and Emergency Response Plan addressing:
 - .1 Standard procedures to be implemented during emergency situations.
 - .2 Preventative planning and protocols to address possible emergency situations. For example, if swing stage work is required, list protocol to be followed if supporting cable breaks.
- .7 Guidelines for handling, storing, and disposing of hazardous materials that may be encountered on site, including measures to prevent damage or injury in case of an accidental spill.
- .3 Incident and accident reports, promptly if and upon occurrence.
- .4 Make submittals in accordance with Section 01 33 00 - Submittal Procedures.

1.4 RESPONSIBILITY

- .1 Contractor responsible for health and safety of persons on Work Site and for protection of persons adjacent to Site to extent that they may be affected by performance of Work.
- .2 Contractor responsible for safety of property and environment on Work Site and for protection of same adjacent to Site to extent that they may be affected by performance of Work.
- .3 Contractor is responsible for health and safety at Work Site and is not relieved by Consultant's review of Health and Safety Plan for Specific Work Site.

1.5 OCCUPATIONAL HEALTH AND SAFETY

- .1 Comply and conform to all health and safety work practices in accordance with regulations and authorities having jurisdiction at Place of Work including, but not limited to:
 - .1 WHMIS awareness and training.
 - .2 Fall-arrest, temporary guardrails, and travel-restraint systems.
 - .3 Eye protection, hardhats, and safety boots.
- .2 Maintain one reference copy on site of Occupational Health and Safety Act and Regulations for Construction Projects for Place of Work, latest edition.
- .3 Ensure that all personnel are adequately equipped to comply with safety regulations and that sufficient safety equipment is available.

- .4 Provide at Work Site sufficient equipment to supply first aid.
- .5 Promptly report to Owner and Consultant all accidents, and any claims made against Contractor or Subcontractor on account of accident.
- .6 Enforce proper work methods and act immediately on directions regarding safety and work practices given by authorities having jurisdiction or by Owner, at no additional cost to Owner.
- .7 Failure of Contractor to comply with verbal or written instructions or orders from Ministry of Labour Inspector, other authorities, Owner, or Consultant regarding safe work practices or provision of specified requirements under regulations to be considered Non-Compliance with Contract.
- .1 Owner or Consultant may stop Work for failure to rectify non-compliance of health and safety regulations.

1.6 WORKPLACE HAZARDOUS MATERIALS INFORMATION SYSTEM (WHMIS)

- .1 Contractor to be familiar with WHMIS regulations and be responsible for compliance.
- .2 Contractor responsible for all other requirements of regulations as applicable to Employers.
- .3 All controlled products to be properly labelled and stored.
- .4 Immediately inform Owner and Consultant if any unforeseen or peculiar safety-related factor, hazard, or condition becomes evident during performance of Work.

PART 2 - PRODUCTS

2.1 NOT USED.

PART 3 - EXECUTION

3.1 NOT USED.

END OF SECTION - 01 35 22

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PART 1 - GENERAL

1.1 SUMMARY

- .1 This Section to compliment General Conditions of the Contract and Supplementary Conditions. Read and interpret this section in conjunction with contract requirements and Division 01 documents. In case of conflict between documents, more stringent condition or requirement shall govern.
- .2 Section Includes:
 - .1 Definition of common terms.
 - .2 Requirements for coordination of construction review.
 - .3 Requirements for confirming performance and compliance of installed work.
 - .4 Requirements for warranty application and milestone review.
 - .5 Control of the Work.

1.2 DEFINITIONS

- .1 "Rooftop Quality Observation" to be consensus definition commonly used in Canadian roofing industry to mean Site Visit and review of observable construction in progress and completed to date, without implying guarantees to performance of completed construction.
- .2 "Observer" to mean authorized individual employed by Rimkus Consulting Group Canada Inc., the entity engaged by Owner to provide Rooftop Quality Observation services for Contract, to perform Rooftop Quality Observation testing of materials and review of construction in progress and completed to date.
- .3 "Site Visit" to mean physical attendance at Place of the Work for purpose of reviewing construction in progress and completed to date.

1.3 REFERENCES

- .1 Latest edition of listed references intended; most stringent requirements to govern in conflicts:
 - .1 Canadian Standards Association (CAN/CSA):
 - .1 A123.21-20: Standard Test Method for Dynamic Wind Uplift Resistance of Membrane Roofing Systems.

1.4 REQUIREMENTS OF ROOFING CONTRACTOR

- .1 Staging and setup on-site in preparation for installation shall signify Contractor's acceptance of contract requirements and responsibility for quality control during performance of Work.
 - .1 Pay for Testing and Inspection services required by regulations and by Contractor's own requirements for quality control.
- .2 Work in good faith and be proactive towards successful completion of Work required to attain warranty from roof membrane manufacturer.
 - .1 Correct defects and irregularities of installed work at no additional cost to Owner.
- .3 Be responsible for associated costs to confirm performance of roof installation work and compliance with intent of Contract Documents, including but not limited to:
 - .1 Documentation:

- .1 Maintain at job site at least one complete hardcopy set of Contract Documents during construction activities for reference and record keeping.
- .2 Contract Documents provided in electronic format for Contractor to make as many copies as deemed necessary for performance of work. Drawing files provided in colour to be printed originals in colour and at intended scale for hardcopy sets to maintain visual clarity intended and eliminate photocopy degradation.
- .3 Hardcopy production of Contract Documents to assist with As-built drawing mark up and red-lining available as an additional service from Consultant.
- .2 Shop Drawings for Wind Uplift Resistance:
 - .1 On conventional low slope or flat roofing areas (slope less than 3:12) using mechanical or adhesive fastening:
 - .1 Determine mechanical and adhesive fastening patterns required by specifications for compliance from chosen manufacturer's roof system testing to meet CSA A123.21 and installation requirements to achieve specified warranty. Design wind uplift forces noted in technical sections.
- .3 Coordination with Consultant:
 - .1 Owner has retained Rimkus Consulting Group Canada Inc. (IRC) to provide independent, third-party, Rooftop Quality Observations for on-site construction review and testing of roofing installation work. Observation fees are based on installation work anticipated and performed in a timely fashion.
 - .1 Employment of Rooftop Quality Observation agency by Owner does not relieve Contractor of responsibility to perform work in accordance Contract Documents.
 - .2 Cooperate with Consultant to facilitate observation and documentation of existing substrate and construction details throughout demolition work.
 - .2 Coordination of Work with Consultant is imperative for successful completion of project and confirmation of compliance with Contract Documents. Coordinate frequency of construction review with Observer to suit finalized project schedule at Pre-construction meeting. Poor performance of Work will result in additional service fees being invoiced directly to Contractor to cover extra costs incurred by Consultant.
 - .3 Missed Site Reviews: Failure to notify Consultant of daily work being performed will result in Contractor being invoiced directly by Consultant for services missed, per occurrence.
 - .1 Portions of Work installed without Consultant's knowledge or coordination, inhibiting ability to schedule and perform Rooftop Quality Observation services, will result in Contractor being invoiced for additional Site Visits required to perform exploratory work and verify installation, including administration time.
 - .4 Additional Site Reviews: When a Site Visit by Consultant is required during construction or after project completion that is outside of intended project scope of work for any reason, such as reported leaks, potential safety violations, deficiencies, incomplete work, or rejected work, Contractor will be invoiced directly by Consultant for additional services required per occurrence, including:

- .1 Failure of a mock-up installation requiring additional Site Visit dedicated to second mock-up review.
 - .2 Insufficient work force allocated to project completion resulting in work duration exceeding intended project schedule.
 - .3 Leaks reported during installation work requiring additional Site Visit by Consultant.
 - .1 Coordinate leak review with Consultant and document leak locations and damages found to building or other roof areas. Produce incident report for reported leaks and provide to Consultant for review.
 - .4 Roof assemblies not maintained in watertight condition that become contaminated with moisture during construction, resulting in additional Site Visits required to help map out areas of contamination to be remediated.
 - .1 Consultant may perform interim thermographic (infrared) roof scan, electronic impedance scanning (EIS), and/or Electric Field Vector Mapping (EFVM) of installed work to help determine extent of moisture infiltration and compliance with Contract Documents, with costs borne by Contractor.
 - .5 Deficiencies identified after Final Review requiring additional Site Visit.
- .4 Roofing Samples & Testing:
- .1 On low slope or flat roofing areas (slope less than 3:12), be responsible for arrangements required for removal and testing of samples, including delivery and pick-up costs.
 - .2 Provide samples of material to testing laboratory and pay for services required to allow verification of installed work.
 - .3 Carry costs associated with roofing sample testing work. Cut-out and remove samples, roughly 300mm x 300mm (12" x 12") in size as follows:
 - .1 Remove samples of completed roof assembly as work progresses and from location determined on-site with Consultant.
 - .2 Provide one sample per 465m² (5,000 ft²) of roof with a minimum of two samples per roof area, or as directed otherwise on-site by Consultant.
 - .3 Unless otherwise requested by Consultant, samples to be whole roof system carefully cut through all layers down to structural roof deck.
 - .4 Repair sample cut-out areas with new roofing product to restore and make good roof system. Ensure continuity of vapour retarder, thermal insulation layers, and watertightness of roof membrane.
 - .4 In event that test results are unsatisfactory, obtain and pay for additional roofing samples for testing from locations determined on-site with Consultant, at no additional cost to Owner.
- .5 Wind Uplift Resistance Testing:

- .1 On conventional low slope or flat roofing areas (slope less than 3:12) using mechanical or adhesive fastening, carry costs associated with mechanical fastener and adhesion testing for wind uplift resistance required for CSA A123.21 compliance.
- .2 Coordinate with Consultant in advance to perform wind uplift tests per roof area.
 - .1 Mechanical fastener testing to be performed at mechanically fastened deck overlay board, insulation board, or cover board layer.
 - .1 Perform one test per 465m² (5,000 ft²) of roof with a minimum of two tests per roof area, or as directed on-site by Consultant.
 - .2 Bond uplift testing or negative pressure uplift testing to be performed over completed roof membrane and system installation.
 - .1 Perform one test per 465m² (5,000 ft²) of roof with a minimum of two tests per roof area larger than 46.5m² (500 ft²), or as directed on-site by Consultant.
 - .3 Repair and restore roof system components damaged by uplift resistance testing.
 - .1 With adhesion testing, mark entire square footprint of testing apparatus to define boundary of roofing materials to be cut out and restored with new products.
 - .4 At areas under construction where uplift resistance testing failed to meet required resistance threshold, adjust amount of mechanical or adhesive fastening and installation pattern to meet wind uplift resistance as directed by Consultant.
- .6 Assist in Warranty Applications.
 - .1 Be proactive with required documentation and application process to ensure Owner's prompt receipt of specified warranties at project close.
 - .2 Start warranty application process prior to start of project and provide evidence of application to Consultant at Pre-construction meeting.
 - .3 Follow manufacturer's protocols and requirements for warranty application.
 - .4 Promptly provide executed warranties to Consultant for distribution after release of holdback.
 - .5 Contractor will be invoiced directly by Consultant for extra services required for warranty process.
- .7 As-Built Drawings:
 - .1 Note changes or sketch deviations from Drawings made on-site to original construction intent by red-lining or other mark up for project record.
 - .2 Copy of red-lined or otherwise marked up Drawings to be submitted to Consultant with Application for Substantial Completion in accordance with Section 01 77 00 - Closeout Procedures and Submittals.
 - .1 If no As-Built mark ups were noted or required, Contractor to provide a signed letter as a Closeout submittal stating that installation work was in accordance with Drawings without significant modification.

.8 Roof Database Records:

- .1 On designated projects where access is granted to Contractor, provide complete data entry of necessary project specifics and details into designated roof management database.

1.5 CONTROL OF THE WORK

- .1 Sole control of construction means, methods, techniques, procedures, safety precautions, and programs required for Work in accordance with applicable construction legislation, regulations, and general construction practice remains with Contractor.
- .2 Consultant not responsible for acts of omissions of Contractor, his Subcontractors, employees, or other persons performing Work.

PART 2 - PRODUCTS

2.1 NOT USED.

PART 3 - EXECUTION

3.1 NOT USED.

END OF SECTION - 01 40 00

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PART 1 - GENERAL

1.1 SECTION INCLUDES

- .1 Barriers
- .2 Environmental Controls
- .3 Fall Arrest
- .4 Traffic Controls
- .5 Fire Routes

1.2 REFERENCES

- .1 Canadian General Standards Board (CGSB)
 - .1 CGSB 1.189M – Primer, Alkyd, Wood, Exterior
 - .2 CGSB 1.59 – Alkyd Exterior Gloss Enamel
- .2 Canadian Standards Association (CSA)
 - .1 CSA O121M – Douglas Fir Plywood
- .3 Occupational Health and Safety Act and regulations for Construction Projects.
- .4 Canadian Standards Association (CSA), CSA S350-M, Code of Practice for Safety in Demolition of Structures.
- .5 Comply with National Building Code of Canada, Part 8, "Safety Measures at Construction and Demolition Sites", and Provincial requirements.

1.3 INSTALLATION AND REMOVAL

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

1.4 WORK AREA HOARDING

- .1 Erect temporary site enclosures where required using:
 - .1 38 x 89 mm (2" x 4") construction grade lumber framing at 600 mm (2') centres and 1200 x 2400 x 13 mm (4' x 8' x 1/2") exterior grade fir plywood to CSA O121. Apply plywood panels vertically flush and butt jointed.
 - .2 1800 mm (6') high interlocking steel fence, with openings no greater than 38 mm (1.5")
- .2 Where required provide a minimum of one lockable truck entrance gate and at least one pedestrian door as directed and conforming to applicable traffic restrictions on adjacent streets. Equip gates with locks and keys.
- .3 Erect and maintain pedestrian walkways including roof and side covers, complete with signs and electrical lighting as required by law.

- .4 Paint public side of site enclosure in selected colours with one coat primer to CAN/CGSB 1.189M and one coat exterior paint to CAN/CGSB 1.59. Maintain public side of enclosure in clean condition.
- .5 Provide barriers around trees and plants designated to remain. Protect from damage by equipment and construction procedures.

1.5 COVERED HOARDING

- .1 Covered hoardings will be required when working over exits that serve as fire exits and locations where entrance or exit is required to remain open during work as stipulated by Owner.
- .2 Covered hoardings to be erected from vertical face of exit/entrance a minimum of:
 - .1 a line from top of work extending on 60° angle from vertical, or
 - .2 6000 mm (20') long.
- .3 Covered hoardings to be provided when work occurs overhead of following:
 - .1 Emergency exits
 - .2 Safe Areas
 - .3 Emergency access roads
 - .4 Entrances and exits determined by Owner to remain open during work
 - .5 Entrances and exits required to remain open to provide adequate egress in and out of building
- .4 Covered hoardings for pedestrian traffic to be constructed as follows:
 - .1 Scaffolding frames with X-bracing at 2400 mm (8') o/c;
 - .2 2x10 planks across top of frames tight together fastened to scaffolding frames;
 - .3 19 mm (3/4") plywood fastened to top of 2x10 planks;
 - .4 minimum 12 mm (1/2") plywood on 38 x 89 mm framing side walls set inside of overhead framing;
 - .5 provide and maintain lighting to a minimum of 50 lux, constructed in a fashion that will mitigate vandalism.
- .5 Covered hoardings for Access roads and Safe Areas to be designed by a Professional Engineer licensed in province for Place of Work under guidelines of provincial Occupational Health and Safety Act and with local authorities having jurisdiction.

1.6 WORKING FROM ROOF

- .1 If and when work is performed on roof, existing roof composition to be protected by following:
 - .1 minimum 25 mm (1") rigid insulation;
 - .2 6 mil polyethylene sheet, lapped at discontinuities by 300 mm (12");
 - .3 19 mm (3/4") plywood sheathing.

1.7 FALL ARREST

- .1 If building does not have an approved roof anchor system in place, supply an engineered rigging system signed and sealed by a Professional Engineer.
- .2 Provide rigging drawings showing location of anchors, life lines and primary suspension lines indicating following:
 - .1 Primary suspension line size.
 - .2 Life safety line size.
 - .3 Quantity and location of counter weights.
 - .4 Size and length of outrigger beam.
 - .5 Configuration of stages, whether bosuns chair, swing stage or tiered swing stage.
 - .6 Details indicating:
 - .1 proprietary beam saddles with anchorage
 - .2 compression fittings
 - .3 shackles or forged hooks
 - .4 protection of life lines
 - .5 size and quantity of cable clips
- .3 Where swing stage rigging is not used prepare plans indicating a location of life line tie offs.
- .4 Provide typical details indicating construction and anchorage for secure, rigid guard rails and barricades around deep excavations, open shafts, open stair wells, open edges of floors and roofs.
- .5 Conform to requirements of Occupational Health and Safety Act and regulations for Construction Projects

1.8 WEATHER ENCLOSURES

- .1 Weather to be considered incidental to work and to not be claimed as additional.
- .2 Applicable standard to be used for materials or building components when enclosures and/or heating is required to complete work.
- .3 Provide weather tight closures for, but not limited to:
 - .1 unfinished door and window openings;
 - .2 openings in floors and roofs;
 - .3 openings through walls;
 - .4 locations where daily work is not completed in a days work and components left exposed are sensitive to weather conditions;
 - .5 protection of materials used that are sensitive to weather conditions.
- .4 Design enclosures to withstand wind pressure, snow loading etc.

1.9 DUST TIGHT SCREENS

- .1 Provide dust tight screens to localize dust generating activities, and for protection of workers, finished areas of Work and public.
- .2 Maintain and relocate protection until such work is complete.
- .3 Provide means for ventilating area if work is to occur in an interior or confined space.
- .4 Ventilate work area when it corresponds with areas used by tenants or patrons concurrently for parking or egress. If dust generation will affect tenants or patrons provide sealed enclosure with adequate ventilation for health and safety of workers.

1.10 ACCESS TO SITE

- .1 Provide and maintain access roads, sidewalk crossings, ramps and construction runways as may be required for access to Work.
- .2 Provide all appropriate signage directing public and building occupants away from work area
- .3 Emergency exits: Maintain clear and unobstructed use of all existing exit doors and routes. This may include provision of overhead protection and enclosed exit walkways in case of overhead work. Provide adequate lighting for 24 hour use.

1.11 PUBLIC TRAFFIC FLOW

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

1.12 FIRE ROUTES

- .1 Maintain access to property including overhead clearances for use by emergency response vehicles.
- .2 Provide all required signage to inform emergency vehicles of temporary route for access if modified as part of work.

1.13 PROTECTION FOR OFF-SITE AND PUBLIC PROPERTY

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

1.14 PROTECTION OF BUILDING FINISHES

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

END OF SECTION - 01 56 00

PART 1 - GENERAL

1.1 SECTION INCLUDES

- .1 Consideration of Substantial Performance.
- .2 Review and rooftop quality Observations required for application of Substantial Performance.
- .3 Review and rooftop quality Observations required for application of Total Completion.
- .4 Closeout Submittals.

1.2 REFERENCES

- .1 Canadian Construction Documents Committee (CCDC):
 - .1 CCDC2–2020 - Stipulated Price Contract.

1.3 CONSIDERATION OF SUBSTANTIAL PERFORMANCE AND COMPLETION BY CONSULTANT

- .1 A contract will be considered substantially performed given following:
 - .1 when improvement to be made under Contract is capable of completion or, where there is a known defect, correction, at a cost of not more than,
 - .1 3 percent of first \$1,000,000 of Contract Price.
 - .2 2 percent of next \$1,000,000 of Contract Price.
 - .3 1 percent of balance of Contract Price.
 - .2 Where work cannot be completed expeditiously for reasons beyond control of Owner or Contractor, remaining costs will be deleted from Contract Price in determination of substantial performance.
- .2 Contract to be considered completed given following:
 - .1 when improvement to be made under that contract is capable of completion or, where there is a known defect, correction, at a cost of lesser of,
 - .1 1 percent of Contract Price.
 - .2 \$1000.00.

PART 2 - PRODUCTS

2.1 NOT USED

PART 3 - EXECUTION

3.1 EXAMINATION AND DECLARATION

- .1 Contractor and all Subcontractors to conduct a review of Work; identify deficiencies and defects in preparation of list for application of Substantial Performance.

- .2 Consultant will schedule date within time allowance of Contract documents for both Consultant and Contractor to perform review of Work and to confirm Work identified on submitted list.
- .3 Consultant will within time allowance of Contract documents provide a breakdown of costs associated with deficiencies and defects for Consideration of Substantial Performance.
- .4 If Work is deemed incomplete in Consideration of Substantial Performance, complete outstanding items and request additional review following same protocol.
- .5 When Contractor is satisfied that Work is completed make application for final review by Consultant. Consultant will within allowances of Contract documents perform final review of Work.
- .6 Any deficiencies and defects to be tabulated with associated costing for Consideration of Completion.
- .7 If Work is deemed incomplete by Consultant, complete outstanding items and request additional review.
- .8 Defective products will be rejected, regardless of previous review and observations. Replace products with new at no expense to Owner.

3.2 MAINTENANCE AND RECORD DOCUMENTS

- .1 Following to be submitted to Owner at completion of Work:
 - .1 Maintenance manuals for, but not limited to, operating instructions, maintenance manuals, record of “as built” drawings, spare parts, maintenance of materials, special tools for completeness.
 - .2 Record of substantial and project completion correspondence inclusive, but not limited to Contractor lists, Consultant tabulations and certificates.
 - .3 Compile all shop drawings that have been submitted.

3.3 RECORDING ACTUAL SITE CONDITIONS

- .1 Submit Actual Conditions as outlined in following sentences.
- .2 Record information on set of Project Specifications provided by Consultant.
- .3 Provide felt tip marking pens, maintaining separate colours for each major system, for recording information.
- .4 Record information concurrently with construction progress. Do not conceal Work until required information is recorded.
- .5 Contract Drawings and shop drawings: legibly mark each item to record actual construction, including:
 - .1 Measured horizontal and vertical locations of underground utilities and appurtenances, referenced to permanent surface improvements.
 - .2 Measured locations of internal utilities and appurtenances, referenced to visible and accessible features of construction.
 - .3 Field changes of dimension and detail.
 - .4 Changes made by change orders.

- .5 Details not on original Contract Drawings.
- .6 References to related shop drawings and modifications.
- .6 Specifications: legibly mark each item to record actual construction, including:
 - .1 Manufacturer, trade name, and catalogue number of each product actually installed, particularly optional items and substitute items.
 - .2 Changes made by Addenda and change orders.

3.4 WARRANTIES AND BONDS

- .1 Separate each warranty or bond with index tab sheets keyed to Table of Contents listing.
- .2 List subcontractor, supplier, and manufacturer, with name, address, and telephone number of responsible principal.
- .3 Obtain warranties and bonds, executed in duplicate by subcontractors, suppliers, and manufacturers, within ten days after certification of completion.
- .4 Verify that documents are in proper form, contain full information, and are notarized.
- .5 Co-execute submittals when required.
- .6 Retain warranties and bonds until time specified for submittal.

3.5 FORMAT

- .1 Organize data in form of an instructional manual.
 - .1 Binders to be vinyl, hard covered, 3 'D' ring, loose leaf 219mm x 279mm (8.5" x11") with spine and face pockets.
 - .2 When multiple binders are used, correlate data into related consistent groupings. Identify contents of each binder on spine.
 - .3 Identify each binder with type or printed title 'Project Record Documents'; list title of project and identify subject matter of contents.
 - .4 Arrange content under Section numbers and sequence of Table of Contents.
 - .5 Provide tabbed fly leaf for each separate product and system, with typed description of product and major component parts of equipment.
 - .6 Manufacturer's printed data, or typewritten data will be accepted.
 - .7 Drawings to be provided with reinforced punched binder tab. Bind in with text; fold larger drawings to size of text pages.

3.6 CONTRACT CLOSE-OUT

- .1 Expedite and complete deficiencies and defects identified by Consultants.
- .2 Submit required documentation such as statutory declarations, Workers' Compensation Certificates, warranties, certificates of approval or acceptance from regulating bodies.
- .3 Review rooftop quality Observation and testing reports to verify conformance to intent of documents and that changes, repairs or replacements have been completed.

- .4 Provide on-going review, examination and attendance to building, call-back, maintenance and repair problems during Warranty periods.
- .5 Provide warranties and bonds fully executed and notarized.
- .6 Execute transition of Performance of Labour and Materials Payment Bond to warranty period requirements.
- .7 Collect and assemble documents executed by Subcontractors, suppliers and manufacturers.
- .8 Close out documents to contain MSDS documents for all materials.

END OF SECTION – 01 77 00

PART 1 - GENERAL

1.1 RELATED SECTIONS

- .1 Section 01 11 00 – Summary of Work
- .2 Section 01 56 00 – Temporary Barriers and Enclosures
- .3 Section 07 52 16 – SBS Modified Bituminous Membrane Roofing

1.2 REFERENCES

- .1 Latest edition of all listed references to apply:
 - .1 Canadian Standards Association CSA S350, Code of Practice for Safety in Demolition of Structures.
 - .2 National Building Code of Canada, Part 8, "Safety Measures at Construction and Demolition Sites", and Provincial requirements.
 - .3 Occupational Health and Safety Act and regulations for Construction Projects.
 - .4 Canadian Environmental Protection Act (CEPA).
 - .5 Canadian Environmental Assessment Act (CEAA).
 - .6 Transportation of Dangerous Goods Act (TDGA).

1.3 ASBESTOS AND DESIGNATED SUBSTANCES

- .1 Demolition of spray or trowel applied asbestos can be hazardous to health.
- .2 Identified Asbestos Contamination: Co-ordinate abatement procedures for Asbestos Containing Materials (ACM) pertinent to successful performance of Work. ACM removal and disposal work identified in Summary of Work to be included in Bid Pricing.
 - .1 All ACM work to be in compliance with current provincial asbestos abatement regulations for Place of Work.
- .3 Unexpected Asbestos Contamination: Notify Consultant if material resembling spray or trowel applied asbestos is encountered on site where unexpected. Stop work and do not proceed with further removal until written instructions have been received from Consultant.
 - .1 Additional ACM discoveries requiring removal and disposal to be paid for by Owner, preapproved by Consultant, as an extra cost to Contract.

1.4 STORAGE AND PROTECTION

- .1 Protect existing items designated to remain and items designated for salvage. In event of damage to such items, immediately replace or make repairs to approval of Consultant and at no cost to Owner.
- .2 In all circumstances, ensure that demolition work does not adversely affect adjacent watercourses, groundwater and wildlife, or contribute to excess air and noise pollution.
- .3 Protect trees, plants and foliage on site and adjacent properties where indicated.

1.5 EXISTING CONDITIONS

- .1 Prior to start of any demolition work, remove contaminated or hazardous materials from site and dispose of at designated disposal facilities.
- .2 Record and discuss with Consultant any deviations from existing assumed conditions as indicated by drawings and/or specifications.

1.6 REGULATORY REQUIREMENTS

- .1 Ensure all work is performed in compliance with CEPA, CEAA, TDGA, and all applicable provincial regulations.

1.7 NOTICE

- .1 Provide a minimum twenty-four (24) hour notice to Consultant and Owner prior to proceeding with any work that may disrupt building access or services.

PART 2 - NOT USED

PART 3 - EXECUTION

3.1 PREPARATION

- .1 Examine site with Consultant and verify extent and location of items designated for removal, disposal, recycling, salvage and items to remain. Removal of HVAC units require confirmation by Owner's Representative.
- .2 Locate and protect utilities where applicable. Notify and obtain approval of utility companies before starting demolition.

3.2 GENERAL PROTECTION

- .1 Prevent movement, settlement, or other damage to adjacent structures, utilities, and parts of building to remain in place. Provide engineered bracing and shoring as required.
- .2 Minimize noise, dust, and inconvenience to occupants.
- .3 Protect existing building systems, services and equipment.
- .4 Provide temporary dust screens, covers, railings, supports and other protection as required.
- .5 Provide required signage, barricades, hoarding, overhead protection and temporary egress.
- .6 Support affected structure or building components and if safety of structure being demolished or adjacent structures or services appears to be endangered, take preventative measures and then cease operations and notify Consultant immediately.
- .7 Ensure that demolition work does not adversely affect adjacent watercourses, groundwater and wildlife, or contribute to excess air and noise pollution.
- .8 Do not dispose of waste or volatile materials such as: mineral spirits, oil, petroleum based lubricants, or toxic cleaning solutions into watercourses, storm or sanitary sewers. Ensure proper disposal procedures are maintained throughout project.
- .9 Do not pump water containing suspended materials into watercourses, storm or sanitary sewers, or onto adjacent properties.

- .10 Control disposal or runoff of water containing suspended materials or other harmful substances in accordance with local authorities.
- .11 Prevent extraneous materials from contaminating air beyond application area, by providing temporary enclosures during demolition work.
- .12 Cover or wet down dry materials and waste to prevent blowing dust and debris. Control dust on all temporary roads.

3.3 DEMOLITION SALVAGE AND DISPOSAL

- .1 Remove parts of existing structure or roof system to permit repairs or new installation. Sort materials into appropriate piles for recycling and or reuse.
- .2 Carry in Base Bid Price all costs to salvage, protect from harm, and re-use following components, unless indicated otherwise elsewhere in specifications:
 - .1 Existing skylights, mechanical equipment, cladding, stairs and ladders, satellite and communications equipment, electrical lines, and service lines, etc.
- .3 Refer to drawings and specifications for items identified for reuse or salvage, if applicable.
- .4 Remove items to be reused, store in a protected location, and reinstall under appropriate section of specification.
- .5 Trim edges of partially demolished building elements to suit future use.
- .6 Include for disposal of removed materials to appropriate Landfill and/or recycling facilities, except where specified otherwise, and in accordance with authority having jurisdiction.
 - .1 Where possible, all existing recyclable materials, gravel, asphalt products, etc. to be transported to an appropriate recycling facility.
 - .2 Provide location of local facility receiving removed recyclable materials to Owner and Consultant.
- .7 Dispose of debris on a continuous basis. Do not stockpile debris in a manner which would overload structure, or impede access around site.

3.4 SEQUENCE OF OPERATION

- .1 Removal:
 - .1 Remove items as indicated in technical sections, including roofing ballast or gravel, metal roofing flashings, roofing membrane and flashings, roofing insulation, and or vapour retarder.
 - .1 Do not disturb items designated to remain in place.
 - .2 Restrict roofing demolition work to sections in limited size that will be restored and made watertight by end of working day.
 - .3 Use extreme caution when performing demolition work around skylights, sloped glazing, and other force and vibration sensitive roof projections.
- .2 Removal From Site:
 - .1 Interim removal of stockpiled material may be required, if it is deemed to interfere with operations of Owner.

- .2 Do not overload existing roof structures.
- .3 Salvage:
 - .1 Carefully dismantle items containing materials for salvage and stockpile salvaged materials at locations acceptable to Owner and Consultant.
- .4 Disposal of Material:
 - .1 Dispose of materials not designated for salvage or reuse on site to be hauled to an authorized disposal site and or recycling facilities.
- .5 Backfill:
 - .1 Backfill in areas as indicated.

3.5 ABANDONED AND UNUSED ITEMS

- .1 Items of unused and/or abandoned rooftop equipment, units, service lines, cabling, and any related supports which are not operational or in use are to be removed and disposed of.
- .2 Existing services for abandoned equipment to be dismantled to below roof deck, and closed off in accordance with local bylaws and Code requirements. Confirm all electrical lockout procedures with Owner's representative.
- .3 Existing roof deck openings to be closed using following guidelines:
 - .1 Openings up to 152mm (6") in diameter or 152x152mm (6"x6"):
 - .1 Metal Decking: Install 610x610mm (24"x24") galvanized steel plate, min. 18ga. secured with 4 screws per side to existing decking.
 - .2 Openings greater than 152mm (6") in diameter or 152x152mm (6"x6"):
 - .1 Wood Planking: Replace with SPF #1 grade boards to match existing thickness. All replacement decking shall have 3 points of bearing. Provide new framing to match original as required.
 - .2 Plywood Decking: Replace with No.1 construction grade plywood sheathing, Good One Side (G1S), to match existing thickness. All replacement decking shall have 3 points of bearing and installed in logical rectangular shapes. New plywood decking to be supported by at least half thickness of roof joist, truss, or rafter underneath. Provide galv. H-clips to existing decking on unsupported sides.
 - .3 Steel Decking: Obtain ruling from Engineer whether decking is to be replaced or suitably overlaid with identical decking. Secure all decking with TEK screws at each lower flute bearing point structure; welding is not permitted.
 - .4 Concrete Deck: Refer to detail drawing.
 - .3 Openings greater than 915x915mm (3'x3'):
 - .1 Consult Structural Engineer for deck review and design of new framing, decking, securement, and any other required support.

3.6 DECK REPAIRS

- .1 Wood Decking: Areas of deteriorated wood planking or plywood decking to be cut out and replaced with new to match existing.
- .2 Metal Decking: Areas of corroded steel decking not requiring replacement to be cleaned using a wire brush to completely remove all evidence of corrosion. Remove all dust and coat with zinc rich epoxy primer to completely cover all areas where corrosion was evident.
- .3 Concrete Decking: Areas of concrete decking with pitted or deteriorated surfaces to be cleaned sufficiently to receive repair material. Repairs to be completed with quick set masonry repair grout trowelled to a smooth even finish, flush with surrounding areas.

3.7 RESTORATION

- .1 Restore areas and existing works outside areas of demolition to match condition of adjacent, undisturbed areas.
- .2 Use only soil treatments and procedures which are not harmful to health, are not injurious to plants, and do not endanger wildlife, adjacent water courses or ground water.

3.8 CLEANUP

- .1 Upon completion of work, remove debris, trim surfaces and leave work site clean.
- .2 Use only cleaning solutions and procedures which are not harmful to health, are not injurious to plants, and do not endanger wildlife, adjacent water courses or ground water.

END OF SECTION - 02 41 19

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PART 1 - GENERAL

1.1 SUMMARY

- .1 Methods and procedures for plant protection, preservation, and restoration of existing plants, trees, and root systems of trees on site that may be affected by grading, excavating, building construction, and roof rehabilitation work.
 - .1 Provide for protection of existing trees, plants, shrubbery, and grassy areas from construction activities.
 - .2 Restore trees, plants, shrubbery, and grassy areas where damaged by construction activities at Contractor's expense to original condition. Arbitration of restoration work by Consultant.

1.2 INTENT

- .1 Intent of preservation is to protect existing trees, plants, and shrubs identified at Prestart Review and where shown on drawings, from damage during construction process and to minimize any change or damage to their branching habit, health, and root system areas.
- .2 Encroachment into protection zones by vehicles, equipment, excavation material, or other by-products of construction will cause soil compaction in root zone decreasing amount of air space in soil necessary to maintain health, vigour, and life of trees and plants.

1.3 EXAMINATION AND SITE REVIEW

- .1 Meet with Consultant and Owner's Representative to review tree and plant preservation measures required at worksite for performance of work, in advance of work commencement.
- .2 Determine location and extent of protective fencing required to suit requirements of Work.
 - .1 Layout of protective fencing to be coordinated on site with Consultant and approved before installation.
 - .2 Designated protection areas must be fenced off at all times, and may not be encroached upon for any reason without prior written authorization from Consultant.

1.4 APPROVALS

- .1 Do not remove branches or limbs from existing trees, remove trees, excavate, or cut roots of trees without prior approval by Consultant. Failure to do so may result in a Stop Work Order.
- .2 Required cutting of branches, limbs, or roots of trees, removal of trees, excavation around trees, or access around trees within tree preservation areas to occur in presence of Owner's Representative and Consultant.
 - .1 Failure to comply will convey responsibility to Contractor for rectification of damages to existing trees and shrubbery at Contractor's expense.

1.5 QUALIFICATIONS

- .1 Tree and plant protection to be directed on site by Consultant.
- .2 Pruning of overhanging tree branches and other tree modifications by qualified Arborist.

PART 2 - PRODUCTS

2.1 NOT USED

PART 3 - EXECUTION

3.1 DISPOSAL OF WASTE

- .1 Do not bury rubbish and waste material on site.

3.2 SITE CLEARING AND PLANT PROTECTION

- .1 Restrict tree and shrub removal to areas identified at Prestart Review and as indicated on drawings.
- .2 Retain and protect existing trees and plants on worksite and adjacent properties where indicated on drawings, identified at Prestart Review with Consultant.
 - .1 Identify trees, plants, and shrubs adjacent to construction work, storage areas, and trucking lanes, and enclose with temporary protective fencing, from grade level to height of 1.2 m (4'-0"), along perimeter line of protection areas where established by Consultant, and as instructed by Consultant.
- .3 Provide protective fencing and signage explaining purpose of protection measures to trade workers on site before commencing with site clearing, excavation, and general construction work.
 - .1 Protect roots of designated trees to perimeter line of protection areas during excavation, site grading, and other construction work to prevent disturbance and damage.
- .4 Excavation and building material storage to be located away from retained trees and protection areas. All excess excavation material beyond what is required for backfilling to be removed immediately from site.
 - .1 All traffic, dumping, and storage of materials is strictly prohibited within protection areas without prior written authorization.
 - .2 Where light vehicle travel is preapproved over grassy areas to access building, provide a continuous temporary 152 mm (6.0") thick layer of wood mulch as a roadway protection, where access road may impact existing tree root systems.
- .5 Tree and plant materials within protection areas or where indicated to be retained that have been damaged in any fashion by Contractor or Subcontractor, to be replaced by Contractor with same species and size at no cost to Owner.
 - .1 If size or species cannot be made available, a fair assessment value based on "Valuation of Landscape Trees, Shrubs and other Plants", 7th edition, published by International Society of Arbor Culturist will be under taken. Assessment will be charged to Contractor at no cost to Owner.

3.3 WATERING OF TREES AND PLANTS

- .1 Where new trees, plants, and seeded grass are installed for restoration work, provide watering of plants a minimum of twelve (12) times throughout summer, or over three month period after planting, to ensure successful growth.
 - .1 At each watering, soak area immediately below tree crown for minimum of eight (8) hours, sufficiently deep to reach feeder roots or as directed by Consultant.

3.4 FERTILIZING EXISTING TREES

- .1 Where new trees, plants, and seeded grass are installed for restoration work, provide fertilization of new trees, plants, and grasses twice (2) per year, spring and fall, for one year, or as directed by Consultant.

3.5 PRUNING

- .1 Branch pruning of dead and hazardous tree limbs to be approved by Consultant and performed by Arborist.
 - .1 Pruning work not identified in specifications or drawings to be an extra to Contract Price.
- .2 Removal of hazardous deadwood and other required crown pruning to be performed before construction work begins.

3.6 ROOT PRUNING OF EXISTING TREES

- .1 Where required, root pruning of existing trees to be undertaken by Arborist and approved by Consultant.
- .2 If excavation through roots is required, excavate by hand and cut roots with sharp saw. Ensure that all cuts are clean and even.
- .3 Where excavation is required, root prune during winter months one year in advanced before excavation is preferred.
 - .1 Where possible, prune roots minimum 254 mm (10.0") back from finished wall locations.

END OF SECTION - 02 50 01

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CLIENT NAME: AGAT CLIENT ON, ON
ATTENTION TO: Greg Wallace
PROJECT: Bill Bolton Arena
AGAT WORK ORDER: 24T112119
OCCUPATIONAL HYGIENE REVIEWED BY: Nivine Basily, Inorganic Team Lead
DATE REPORTED: Jan 24, 2024
PAGES (INCLUDING COVER): 5
VERSION*: 1

Should you require any information regarding this analysis please contact your client services representative at (905) 712-5100

***Notes**

Disclaimer:

- All work conducted herein has been done using accepted standard protocols, and generally accepted practices and methods. AGAT test methods may incorporate modifications from the specified reference methods to improve performance.
- All samples will be disposed of within 30 days after receipt unless a Long Term Storage Agreement is signed and returned. Some specialty analysis may be exempt, please contact your Client Project Manager for details.
- AGAT's liability in connection with any delay, performance or non-performance of these services is only to the Client and does not extend to any other third party. Unless expressly agreed otherwise in writing, AGAT's liability is limited to the actual cost of the specific analysis or analyses included in the services.
- This Certificate shall not be reproduced except in full, without the written approval of the laboratory.
- The test results reported herewith relate only to the samples as received by the laboratory.
- Application of guidelines is provided "as is" without warranty of any kind, either expressed or implied, including, but not limited to, warranties of merchantability, fitness for a particular purpose, or non-infringement. AGAT assumes no responsibility for any errors or omissions in the guidelines contained in this document.
- All reportable information as specified by ISO/IEC 17025:2017 is available from AGAT Laboratories upon request.
- For environmental samples in the Province of Quebec: The analysis is performed on and results apply to samples as received. A temperature above 6°C upon receipt, as indicated in the Sample Reception Notification (SRN), could indicate the integrity of the samples has been compromised if the delay between sampling and submission to the laboratory could not be minimized.



Certificate of Analysis

AGAT WORK ORDER: 24T112119

PROJECT: Bill Bolton Arena

5835 COOPERS AVENUE
MISSISSAUGA, ONTARIO
CANADA L4Z 1Y2
TEL (905)712-5100
FAX (905)712-5122
<http://www.agatlabs.com>

CLIENT NAME: AGAT CLIENT ON

SAMPLING SITE:40 Rossmore Rd, Toronto ON

ATTENTION TO: Greg Wallace

SAMPLED BY:GW

Lead in Paint

DATE RECEIVED: 2024-01-16

DATE REPORTED: 2024-01-24

		SAMPLE DESCRIPTION:		Siding Paint 1	Siding Paint 2	Siding Paint 3
		SAMPLE TYPE:		Paint	Paint	Paint
		DATE SAMPLED:		2024-01-12 11:00	2024-01-12 11:00	2024-01-12 11:00
Parameter	Unit	G / S	RDL	5585782	5585785	5585786
Lead	µg/g		10	126	93	138

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard

Analysis performed at AGAT Toronto (unless marked by *)

Certified By:



Nivine Basly

Quality Assurance

CLIENT NAME: AGAT CLIENT ON

AGAT WORK ORDER: 24T112119

PROJECT: Bill Bolton Arena

ATTENTION TO: Greg Wallace

SAMPLING SITE: 40 Rossmore Rd, Toronto ON

SAMPLED BY: GW

Occupational Hygiene Analysis

RPT Date: Jan 24, 2024

DUPLICATE

REFERENCE MATERIAL

METHOD BLANK SPIKE

MATRIX SPIKE

PARAMETER	Batch	Sample Id	Dup #1	Dup #2	RPD	Method Blank	REFERENCE MATERIAL			METHOD BLANK SPIKE			MATRIX SPIKE		
							Measured Value	Acceptable Limits		Recovery	Acceptable Limits		Recovery	Acceptable Limits	
								Lower	Upper		Lower	Upper		Lower	Upper

Lead in Paint

Lead	5593429	33	37	NA	< 10	104%	80%	120%	98%	80%	120%	92%	70%	130%
------	---------	----	----	----	------	------	-----	------	-----	-----	------	-----	-----	------

Comments: NA signifies Not Applicable.

Duplicate NA: results are under 5X the RDL and will not be calculated.

Certified By:


Nivine Basily

Method Summary

CLIENT NAME: AGAT CLIENT ON

AGAT WORK ORDER: 24T112119

PROJECT: Bill Bolton Arena

ATTENTION TO: Greg Wallace

SAMPLING SITE: 40 Rossmore Rd, Toronto ON

SAMPLED BY: GW

PARAMETER	AGAT S.O.P	LITERATURE REFERENCE	ANALYTICAL TECHNIQUE
Occupational Hygiene Analysis			
Lead	MET-93-6106	EPA SW 846 3050B & 6010C	ICP/OES



Chain of Custody Record

If this is a Drinking Water sample, please use Drinking Water Chain of Custody Form (potable water consumed by humans)

Report Information:

Company: RIMKUS
Contact: GREG WALLACE
Address: 2121 ARGENTIA RD, 4TH FLOOR
MISSISSAUGA, ON
Phone: 905-876-5422 Fax: _____
Reports to be sent to:
1. Email: gwallace@rimkus.com
2. Email: _____

Project Information:

Project: BILL BOLTON ARENA
Site Location: 46 ROSS MORE RD, TORONTO, ON
Sampled By: GREG WALLACE
AGAT Quote #: _____ PO: _____
Please note: If quotation number is not provided, client will be billed full price for analysis.

Invoice Information:

Company: _____
Contact: _____
Address: _____
Email: _____
Bill To Same: Yes ☐ No ☐

Regulatory Requirements:

(Please check all applicable boxes)

☐ Regulation 153/04 ☐ Regulation 406 ☐ Sewer Use
☐ Sanitary ☐ Storm
Table Indicate One Table Indicate One Region _____
☐ Ind/Com ☐ Res/Park ☐ Prov. Water Quality Objectives (PWQO)
☐ Agriculture ☐ Regulation 558 ☐ Other
Soil Texture (Check One) ☐ CCME ☐ Coarse ☐ Fine
Indicate One

Is this submission for a Record of Site Condition?

☐ Yes ☐ No

Report Guideline on Certificate of Analysis

☐ Yes ☐ No

Sample Matrix Legend

GW Ground Water
O Oil
P Paint
S Soil
SD Sediment
SW Surface Water

Laboratory Use Only

Work Order #: 24T112119
Cooler Quantity: 1 bag
Arrival Temperatures: N/A
Custody Seal Intact: ☐ Yes ☐ No ☐ N/A
Notes: _____

Turnaround Time (TAT) Required:

Regular TAT ☒ 5 to 7 Business Days

Rush TAT (Rush Surcharges Apply)

☐ 3 Business Days ☐ 2 Business Days ☐ Next Business Day

OR Date Required (Rush Surcharges May Apply): _____

Please provide prior notification for rush TAT
*TAT is exclusive of weekends and statutory holidays

For 'Same Day' analysis, please contact your AGAT CPM

Sample Identification	Date Sampled	Time Sampled	# of Containers	Sample Matrix	Comments/ Special Instructions	Y / N	Metals	Metals	BTEX, F	VOC	PAHs	PCBs	PCBs: Ar	Landfill	Tox.P. □	Regulation SPLP: □	Regulation pH, ICPM	Corrosiv	HE	Potential
1. SIDING PAINT 1	JAN 12/24	11:06	AM PM																✓	
2. SIDING PAINT 2	JAN 12/24	11:06	AM PM																✓	
3. SIDING PAINT 3	JAN 12/24	11:00	AM PM																✓	
4.			AM PM																	
5.			AM PM																	
6.			AM PM																	
7.			AM PM																	
8.			AM PM																	
9.			AM PM																	
10.			AM PM																	
11.			AM PM																	

Samples Relinquished By (Print Name and Sign):	Date	Time	Samples Received By (Print Name and Sign):	Date	Time	24 JAN 16 11:36 AM
Samples Relinquished By (Print Name and Sign):	Date	Time	Samples Received By (Print Name and Sign):	Date	Time	
Samples Relinquished By (Print Name and Sign):	Date	Time	Samples Received By (Print Name and Sign):	Date	Time	

Laboratory Analysis Report

To:

Greg Wallace
Rimkus
2121 Argentia Road, Suite 401
Mississauga, Ontario
L5N 2X4

EMC LAB REPORT NUMBER: A99636

Job/Project Name: Bill Bolton Arena

Analysis Method: Polarized Light Microscopy – EPA 600

Date Received: Jan 16/24

Date Analyzed: Jan 23/24

Analyst: Ameerah Ngai

Reviewed By: Malgorzata Sybydlo

Job No: 100229845

Number of Samples: 6

Date Reported: Jan 23/24

Client's Sample ID	Lab Sample No.	Description/Location	Sample Appearance	SAMPLE COMPONENTS (%)			
				Asbestos Fibres		Non-asbestos Fibres	Non-fibrous Material
1	A99636-1	Roof Area 1.1- sample 1 Mod bit membrane, fibreboard (beige), BUR membrane, fibreboard (brown), kraft paper	7 Phases: a) Black, tar b) Black, tar with fibres c) Black, fibrous material with tar d) Grey, compressed fibrous material e) Black, tar f) Brown, paper g) Brown and black, fibrous material with tar	ND			100
				ND		20	80
				ND		80	20
				ND		90	10
				ND			100
				ND		90	10
				ND		80	20
2	A99636-2	Roof Area 1.1-sample 2 Mod bit membrane, fibreboard (beige), BUR membrane, fibreboard (brown), kraft paper	7 Phases: a) Black, tar b) Black, tar with fibres c) Black, fibrous material with tar d) Grey, compressed fibrous material e) Black, tar f) Brown, paper g) Brown and black, fibrous material with tar	ND			100
				ND		20	80
				ND		80	20
				ND		90	10
				ND			100
				ND		90	10
				ND		80	20
3	A99636-3	Roof Area 1.1- sample 3 Mod bit membrane, fibreboard	7 Phases: a) Black, tar	ND			100

EMC LAB REPORT NUMBER: A99636
Client's Job/Project Name/No.: 100229845
Analyst: Ameerah Ngai

Client's Sample ID	Lab Sample No.	Description/Location	Sample Appearance	SAMPLE COMPONENTS (%)			
				Asbestos Fibres		Non-asbestos Fibres	Non-fibrous Material
		(beige), BUR membrane, fibreboard (brown), kraft paper	b) Black, tar with fibres c) Black, fibrous material with tar d) Grey, compressed fibrous material e) Black, tar f) Brown, paper g) Brown and black, fibrous material with tar	ND		20	80
				ND		80	20
				ND		90	10
				ND			100
				ND		90	10
				ND		80	20
4	A99636-4	Roof Area 2.1- sample 1 Mod bit membrane, fibreboard, BUR membrane, construction paper	4 Phases: a) Black, tar b) Black, tar with fibres c) Brown, compressed fibrous material d) Black, fibrous material with tar	ND			100
				ND		20	80
				ND		90	10
				ND		80	20
5	A99636-5	Roof Area 2.1- sample 2 Mod bit membrane, fibreboard, BUR membrane, construction paper	4 Phases: a) Black, tar b) Black, tar with fibres c) Brown, compressed fibrous material d) Black, fibrous material with tar	ND			100
				ND		20	80
				ND		90	10
				ND		80	20
6	A99636-6	Roof Area 2.1- sample 3 Mod bit membrane, fibreboard, BUR membrane, construction paper	4 Phases: a) Black, tar b) Black, tar with fibres c) Brown, compressed fibrous material d) Black, fibrous material with tar	ND			100
				ND		20	80
				ND		90	10
				ND		80	20

Note:

EMC LAB REPORT NUMBER: A99636
Client's Job/Project Name/No.: 100229845
Analyst: Ameerah Ngai

1. Bulk samples are analyzed using Polarized Light Microscopy (PLM) and dispersion staining techniques. The analytical procedures are in accordance with EPA 600/R-93/116 method.
2. The results are only related to the samples analyzed. **ND** = None Detected (no asbestos fibres were observed), **NA** = Not Analyzed (analysis stopped due to a previous positive result).
3. This report may not be reproduced, except in full without the written approval of EMC Scientific Inc. This report may not be used by the client to claim product endorsement by NVLAP or any other agency of the U.S. Government.
4. The Ontario Regulatory Threshold for asbestos is 0.5%. The limit of quantification (LOQ) is 0.5%.

PART 1 - GENERAL

1.1 RELATED SECTIONS

- .1 Section 01 56 00 – Temporary Barriers and Enclosures
- .2 Section 02 41 19 – Selective Demolition and Removal
- .3 Section 07 52 16 – SBS Modified Bituminous Membrane Roofing
- .4 Section 07 62 00 – Prefinished Sheet Metal Flashing and Trim

1.2 REFERENCES

Latest edition of listed references apply; most stringent requirement to govern in case of conflict.

- .1 American Lumber Standards Committee (ALSC):
 - .1 Softwood Lumber Standards.
- .2 American Society for Testing and Materials (ASTM) International:
 - .1 A153M-16a: Standard Specification for Zinc Coating (Hot-Dip) on Iron & Steel Hardware.
 - .2 A653M-15e1: Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by Hot-Dip Process.
 - .3 D1760-01: Standard Specification for Pressure Treatment of Timber Products.
- .3 American Wood-Protection Association (AWPA):
 - .1 AWPA E12: Standard Method of Determining Corrosion of Metal in Contact with Wood.
 - .2 AWPA M4: Standard for the Care of Preservative Treated Wood Products.
 - .3 AWPA P5: Standard for Waterborne Preservatives.
 - .4 AWPA P26: Standard for Alkaline Copper Quat Type A (ACQ-A).
 - .5 AWPA P27: Standard for Alkaline Copper Quat Type B (ACQ-B).
 - .6 AWPA P28: Standard for Alkaline Copper Quat Type C (ACQ-C).
 - .7 AWPA P29: Standard for Alkaline Copper Quat Type D (ACQ-D).
 - .8 AWPA U1: Use Category System: User Specification for Treated Wood.
- .4 Canadian Standards Association (CAN/CSA):
 - .1 B111-1974 (R2003): Wire Nails, Spikes and Staples.
 - .2 G164-M92 (R2003): Hot Dip Galvanizing of Irregularly Shaped Articles.
 - .3 O121-17: Douglas Fir Plywood.
 - .4 O141-05 (R2014): Softwood Lumber.
 - .5 O151-17: Canadian Softwood Plywood.
 - .6 O325-16: Construction Sheathing.
- .5 Engineered Wood Association (EWA); formerly American Plywood Association (APA):
 - .1 Product Guide: Grades and Specifications.
- .6 National Forest Products Association (NFPA):
 - .1 Grading Rules.
- .7 National Lumber Grades Authority (NLGA):
 - .1 Standard Grading Rules for Canadian Lumber (2014).

1.3 QUALITY ASSURANCE

- .1 Lumber identification to be by grade stamp of an agency certified by Canadian Lumber Standards Accreditation Board.
- .2 Plywood identification to be by grade mark in accordance with applicable CSA standards.
- .3 Plywood, OSB and wood based composite panel construction sheathing identification to be by grademark in accordance with applicable CSA standards.
- .4 At all times during Work, Contractor will have on site a qualified project supervisor. It will be Supervisor's responsibility to ensure that Work is carried out in an efficient manner, according to Plans and Specifications.

1.4 DELIVERY, STORAGE, AND HANDLING

- .1 Protect lumber and other products from dampness both during and after delivery at site.
- .2 Pile lumber in stacks in such manner as to provide air circulation around surfaces of each piece.
- .3 Stack plywood and other board products so as to prevent warping.
- .4 Locate stacks on well drained areas, supported at least 152mm (6") above grade and cover with well ventilated sheds having firmly constructed over hanging roof with sufficient end wall to protect lumber from driving rain.

1.5 WASTE MANAGEMENT AND DISPOSAL

- .1 Set aside damaged wood and dimensional lumber off-cuts for acceptable alternative uses (e.g. bracing, blocking, cripples, bridging, finger-joining, or ties). Store this separated reusable wood waste convenient to cutting station and area of work.
- .2 Separate and recycle waste materials in accordance with applicable local, provincial and national regulations. Include for tipping fees associated with landfills and recycling depots
- .3 Unused preservatives and fire retardant materials are to be diverted from landfill through disposal at a special wastes depot.
- .4 Do not burn scrap at project site.
- .5 Fold up metal banding, flatten, and place in designated area for recycling.

PART 2 - PRODUCTS

2.1 LUMBER MATERIALS

- .1 Materials to be best merchantable lumber, straight and sized and shaped to correct dimensions from nominal sizes noted on drawings. Lumber to be selected from well seasoned stock, free from loose resinous knots, shakes, waxed edges, splits, dry rot or other defects which would impair strength or durability.
- .2 Lumber in accordance with following standards:
 - .1 CAN/CSA-O141.
 - .2 NLGA Standard Grading Rules for Canadian Lumber.
- .3 Unless specified otherwise all framing members to be No.1/No.2 SPF.

- .4 All materials directly exposed to exterior to be pressure treated unless noted otherwise on drawings or elsewhere in specification.
- .5 Furring, blocking, nailing strips, grounds, rough bucks, cants, curbs, fascia backing and sleepers to be pressure treated where exposed to exterior elements.
- .6 Moisture Content:
 - .1 At time of delivery and maintained at site.
 - .2 Boards and lumber 51mm (2") and less in thickness: 19% or less.
 - .3 Lumber over 51mm (2") thick: 25% or less.
- .7 Preservative Treatment:
 - .1 All wood exposed to exterior environmental conditions, in contact with concrete or masonry to be treated with roof preservative.
 - .2 Do not treat Heart Redwood and Western Red Cedar.
 - .3 Treat wood members and plywood exposed to weather or in contact with plaster, masonry or concrete, including framing of open roofed structures; sills, sole plates, furring, and sleepers that are less than 610mm (24") from ground; nailers, edge strips, blocking, crickets, curbs, cant, vent strips and other members used in connection with roofing and flashing materials.
 - .4 Treat other members specified as preservative treated (PT).
 - .5 Preservative treatment by pressure method to ASTM D1760; except any process involving use of prohibited Chromated Copper Arsenate (CCA).

2.2 PANEL MATERIALS

- .1 Douglas fir plywood (DFP): to CSA O121, standard construction, Good one side (G1S) when in contact with roofing membrane.
- .2 Canadian softwood plywood (CSP): to CSA O151, standard construction, Good one side (G1S) when in contact with roofing membrane.
- .3 Plywood, OSB and wood based composite panels: to CAN/CSA-O323.

2.3 ACCESSORIES

- .1 Bent metal plate: 18ga or 22ga, galvanized metal sheet, formed as required or as indicated on drawings to provide support for wood blocking or roof assembly components.
- .2 Anchorage to hollow masonry and gypsum walls: Galvanized toggle bolts.
- .3 Anchorage to solid masonry or concrete: Expansion shields and lag bolts:
 - .1 Rawl mushroom head lead anchors, min 6mm (0.25") diameter for sheathing,
 - .2 Hilti Kwik-Bolts for structural members.
- .4 Anchorage of wood members to sheet steel studs: Corrosion coated screws, min #14 thread, of length to penetrate minimum 19mm (0.75") through material into base.
- .5 Nails: Minimum 6d, hot dip galvanized spiral or ring shank nails, length to penetrate through material 38mm (1.5") into base.

- .6 Anchorage of wood blocking to masonry: Masonry screws, Tapcon anchors of sufficient length to penetrate 32mm (1.25") into masonry surfaces.
- .7 Batt Insulation: Stone wool mineral fiber batt insulation, Rockwool by Roxul Inc.
- .8 Explosive actuated fastening devices are prohibited for use on this project.

2.4 ACCESSORY FINISHES

- .1 Galvanizing: to CAN/CSA-G164:
 - .1 galvanized fasteners for all exterior work unless otherwise specified
 - .2 galvanized fasteners for all high interior humid areas unless otherwise specified
- .2 Use stainless steel type 304 where noted on drawings

PART 3 - EXECUTION

3.1 PREPARATION

- .1 Comply with safety regulations and applicable bylaws governing work included in this section. Provide and maintain necessary barriers, guards and rails.
- .2 Scope of work includes parapet wall, roof joint, and wall modifications as indicated on drawings or as required to provide a secure, smooth surface to receive the new roof and flashing assembly:
 - .1 Install wood blocking secured into existing surfaces adequately to resist movement and wind uplift forces as per FMG 1-49, minimum 200 pounds/foot.
 - .2 Install mineral fiber insulation at all voids and as indicated on drawings.
 - .3 Install plywood sheathing to drawings.
- .3 Complete wood blocking and sheathing to walls, curbs and drains as indicated on drawings.

3.2 SITE APPLIED WOOD TREATMENTS

- .1 Treat only wood blocking which will remain exposed to the elements.
- .2 Treat ends of site cut surfaces of materials delivered to site with wood preservative.
- .3 Re-treat surfaces exposed by cutting, trimming or boring with liberal brush application of preservative before installation.

3.3 INSTALLATION

- .1 Comply with requirements of Provincial Building Code at Place of Work, supplemented by following paragraphs:
 - .1 Ensure continuity and completeness of vapour retarder membrane as coinciding with new wood blocking installation.
 - .2 Provide mineral wool insulation to fill voids at roof deck level or as otherwise required or indicated on detail drawings.
 - .3 Install furring and blocking as required to space-out and support new walls, window projections and louver extensions, fascia, soffit, siding and other work as required.
 - .4 Align and plumb faces of furring and blocking to tolerance of 1:600.

- .5 Install rough bucks, nailers and linings to rough openings as required to provide backing for frames and other work.
- .6 Install wood cants, fascia backing, nailers, curbs and other wood supports as required and secure with adequate fasteners.
- .7 Install sleepers as indicated.

3.4 ERECTION

- .1 Frame, anchor, fasten, tie and brace members to provide necessary strength and rigidity.
- .2 Countersink bolts where necessary to provide clearance for other work.

END OF SECTION - 06 10 00

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PART 1 - GENERAL

1.1 SECTION INCLUDES

- .1 Installation of a new roof system over prepared substrate.
- .2 Existing roofing components and related appurtenances to be removed as specified in preparation for installation of a new low slope, conventional roofing system, including but not limited to:
 - .1 On Roof Area 1.1:
 - .1 Existing metal roof deck,
 - .2 13mm (0.5") siliconized gypsum roof board, in adhesive,
 - .3 1 ply SBS & woven polyethylene vapour retarder field membrane, self-adhered,
 - .4 1 ply modified bitumen vapour retarder flashings, self-adhered,
 - .5 51mm (2.0") polyisocyanurate base insulation, in adhesive,
 - .6 Tapered polyisocyanurate overlay insulation, min. 51mm (2.0"), in adhesive,
 - .7 JM and Siplast Option: 13mm (0.5") gypsum cover board (and self-adhered base sheet), in adhesive,
OR
Soprema Option: 7.0mm (9/32") 2-1 Soprasmart Board (with laminated base sheet), in adhesive.
 - .8 1 ply modified bitumen base sheet flashings, self-adhered,
 - .9 1 ply granular mod. bit cap sheet field membrane, torch applied,
 - .10 1 ply mod. bit cap sheet flashing membrane, torch applied,
 - .11 Prefinished metal flashings and trim.
 - .2 On Roof Area 2.1:
 - .1 Existing plank wood roof deck,
 - .2 13mm (0.5") siliconized gypsum roof board, mechanically fastened,
 - .3 1 ply SBS & woven polyethylene vapour retarder field membrane, self-adhered,
 - .4 1 ply modified bitumen vapour retarder flashings, self-adhered,
 - .5 51mm (2.0") polyisocyanurate base insulation, in adhesive,
 - .6 Tapered polyisocyanurate overlay insulation, min. 51mm (2.0"), in adhesive,
 - .7 JM and Siplast Option: 13mm (0.5") gypsum cover board (and self-adhered base sheet), in adhesive,
OR
Soprema Option: 7.0mm (9/32") 2-1 Soprasmart Board (with laminated base sheet), in adhesive.
 - .8 1 ply modified bitumen base sheet flashings, self-adhered,
 - .9 1 ply granular mod. bit cap sheet field membrane, torch applied,
 - .10 1 ply mod. bit cap sheet flashing membrane, torch applied,
 - .11 Prefinished metal flashings and trim.

1.2 RELATED SECTIONS

- .1 Section 02 41 19 – Selective Demolition & Removal
- .2 Section 07 62 00 – Prefinished Sheet Metal Flashing & Trim
- .3 Section 07 92 00 – Joint Sealants

1.3 REFERENCES

- .1 Latest edition of all listed references; most stringent requirements to govern in conflicts:
 - .1 American Society for Testing and Materials (ASTM) International:
 - .1 C208: Cellulosic Fibre, Insulating Board.
 - .2 C578: Rigid, Cellular Polystyrene Thermal Insulation.
 - .3 C1177(M): Standard Specification for Glass Mat Gypsum Substrate.
 - .4 C1289: Faced Rigid Cellular Polyisocyanurate Thermal Insulation Board.
 - .5 C1396(M): Standard Specification for Gypsum Board.
 - .6 D41: Asphalt Primer Used in Roofing, Dampproofing, and Waterproofing.
 - .7 D312: Asphalt Used in Roofing.
 - .8 D2822: Asphalt Roof Cement.
 - .9 D4601: Standard for Asphalt Coated Glass Fibre Base Sheet Used in Roofing.
 - .10 D6162: SBS Mod. Bit. Sheets Using Polyester & Glass Fibre Reinforcements.
 - .11 D6163: SBS Mod. Bit. Sheets Using Glass Fibre Reinforcements.
 - .12 D6164: SBS Mod. Bit. Sheets Using Polyester Reinforcements.
 - .2 Canadian Standards Association (CAN/CSA):
 - .1 A123.2: Asphalt Coated Roofing Sheets.
 - .2 A123.16: Asphalt Coated Glass Base Sheets.
 - .3 A123.21: Dynamic Wind Uplift Resistance of Roof Assemblies.
 - .4 A231.1A: Precast Concrete Paving Slabs.
 - .5 O121M: Douglas Fir Plywood.
 - .6 O151M: Canadian Softwood Plywood.
 - .3 Canadian General Standards Board (CAN/CGSB):
 - .1 37.29M: Rubber-Asphalt Sealing Compound
 - .2 37-GP-9M: Primer, Asphalt, unfilled, for Asphalt Roofing and Waterproofing.
 - .3 37-GP-15M: Application of Asphalt Primer for Asphalt Roofing & Waterproofing.
 - .4 37-GP-56M: Membrane, Bituminous, Prefabricated and Reinforced for Roofing.
 - .5 51.26M: Thermal Insulation, Urethane and Isocyanurate, Boards, Faced.
 - .6 51.33M: Vapour Barrier Sheet, Excluding Polyethylene, for use in Construction.
 - .4 Underwriters Laboratories of Canada (CAN/ULC):
 - .1 S701: Thermal Insulation, Polystyrene, Boards and Pipe Covering.
 - .2 S704: Thermal Insulation, Polyurethane and Polyisocyanurate, Boards, Fixed.
 - .5 Ontario Industrial Roofing Contractors Association (OIRCA): Roofing Manual.
 - .6 Canadian Roofing Contractors Association (CRCA): Roofing and Waterproofing Manual.

1.4 DESIGN REQUIREMENTS

- .1 Design Wind Load: Install new roof systems to manufacturer's tested and approved roof system assemblies and meet or exceed design wind uplift resistance criteria of CSA A123.21. Wind uplift analysis performed for building using NRCC's wind load calculator for roof coverings with resulting parameters listed below.
 - .1 Wind Uplift Pressure to Meet:
 - .1 Roof Areas 1.1 and 2.1:
 - .1 Corner & Edge Zone Width (z): 3.66m (12'-0").

- .2 Corner of Roof (c): -2.87 kPa (-60 psf).
- .3 Edge of Roof (s): -1.34 kPa (-28 psf)
- .4 Field of Roof (r): -0.96 kPa (-20 psf).

- .2 Confirm calculation and interpretation of wind parameters with chosen primary membrane manufacturer and submit manufacturer's System Letter noting compliance.
- .2 Shop Drawings: Provide mechanical and adhesive fastening patterns where required by specifications for compliance from chosen manufacturer's roof system testing for wind uplift and installation requirements to achieve specified warranty.

1.5 SUBMITTALS BY ROOFING CONTRACTOR

- .1 Provide with Bid Submission for Roof Work:
 - .1 Certificate of Insurance for ten million (\$10,000,000⁰⁰) in Liability,
 - .2 WSIB Clearance Letter,
 - .3 Sample copy of Manufacturer's Labour, Material, and Workmanship Warranty,
 - .4 Sample copy of Contractor's Warranty.
- .5 Roof System Warranty Letter:
 - .1 Copy of current letter from a specified membrane manufacturer stating opinion that Bidder has necessary resources and expertise required to perform specified work, is an approved applicator of specified roofing system, and is eligible to receive specified Labour, Material, and Workmanship Warranty for an extended warranty term of ten (10) years.
 - .2 FAILURE TO PROVIDE WARRANTY LETTER WILL RESULT IN BID SUBMISSION TO BE DEEMED INFORMAL AND MAY BE EXCLUDED FROM CONSIDERATION.
- .2 Provide to Quality Observer, within five (5) working days after Notice of Award:
 - .1 Initial project work schedule showing anticipated progress stages and final completion of work from Start Date. Do not commence Work before project schedule has been provided and reviewed.
 - .2 Provincial Ministry's Notice of Project form or equivalent for Place of Work, notarized and executed.
 - .3 Current WSIB Clearance Letter for Place of Work.
 - .4 Specified Bonding and Insurance in Owner's name.
- .3 Provide to Quality Observer, at Prestart Meeting:
 - .1 Finalized project work schedule listing start date, anticipated number of working days working, and manpower assignments for project.
 - .2 Sample of specified warranties from Manufacturer and Contractor for proposed materials and products to be installed.
 - .3 Letter and completed Manufacturer's project warranty application form sent to "Warranty Provider" advising them of project start and particulars.
 - .4 Complete Materials List; including installation instructions and product datasheets providing characteristics of all proposed materials to be installed.

- .5 Material Safety Data Sheets (MSDS) pertaining to all proposed materials to be used on site to perform Work.
- .6 Certifications by manufacturers of roofing and insulating materials that all products supplied comply with all requirements of current identified ASTM and other industry standards or practices.
- .7 Letter by Contractor certifying that all specified roof system components are compatible, are approved by Manufacturer, meet specified warranty terms, and are compatible with existing substrates.
- .8 Applicable shop drawings for tapered insulation layout and other specified items to be reviewed by Consultant prior to prefabrication and delivery.
- .9 Attachment pattern diagrams to meet wind uplift requirements for mechanical fastening and adhesive securement of deck boards, insulation boards, and cover boards where applicable to project.
- .10 List of “Trained and Carded Membrane Approved Applicators” to work and be present during performance of Work.
- .11 Health & Safety Plan for Specific Work Site including contact list and phone numbers for project, and twenty-four (24) hour emergency contact numbers.
- .4 Provide to Owner, at project completion:
 - .1 Completed and executed Roof System Warranty for project areas,
 - .2 Completed and executed Contractor's Warranty for project areas.

1.6 ROOFING CONTRACTOR QUALIFICATION

- .1 Contractor to perform specified Work must:
 - .1 have a minimum ten (10) years work experience with materials specified or similar comparable products,
 - .2 be a member in good standing with Ontario Industrial Roofing Contractors Association (OIRCA),
 - .3 and be licensed and insured for Place of Work.
- .2 Contractor must be preapproved and certified by Membrane Manufacturer for specified materials, installation type, and warranty requirements.
 - .1 Contractor's installers must be certified and carded for installation of specified materials.
 - .2 Contractor's employees and Subcontractors must be WHMIS certified.
 - .3 Owner reserves right to reject any proposed Subcontractor for reasonable cause.
- .3 Any Bidder, when specifically requested, must complete a questionnaire listing Contractor's qualifications on a form provided by Owner or Consultant, or a CCDC 11 – Contractors' Qualifications Statement with submission of Bid.
 - .1 Acceptance or rejection of submitted qualifications for suitability to perform specified Work to be made within three (3) working days.

1.7 QUALITY ASSURANCE

- .1 Compatibility between components of roofing system and wall system is essential. Provide written declaration to Consultant stating that materials and components, as assembled in new system will meet this requirement.
- .2 Perform Work in accordance with Contracts Documents and Manufacturer's written instructions.
- .3 Make no deviation from Project Specifications or approved shop drawings without prior written approval by Consultant and, if applicable, Manufacturer.
- .4 Arrange for a Technical Representative of Manufacturer to review installed roof system wherever a System Warranty requirement has been specified.
- .5 Upon completion of new installation, provide certification that all work has been done in accordance with Contract Documents and to Manufacturer's requirements.

1.8 QUALITY OBSERVATION

- .1 Rimkus Consulting Group Canada Inc., hereafter known as "Observer", is an independent Rooftop Quality Observation Agency appointed by Owner to observe performance of roof Work:
 - .1 Roofing Contractor to Arrange Prestart site meeting with Observer no more than three (3) weeks prior to commencement of Work on site. Obtain Observer's instructions and reference procedures to be followed on project.
 - .2 Provide to Observer date when each phase of work will begin, at least forty-eight (48) hours prior to commencement of Work for phase.
 - .3 Arrange Final Observation and examination of installed roof with both Observer and Manufacturer's Technical Representative.
- .2 Cooperate with Observer and afford all facilities necessary to permit full Rooftop Quality Observations during performance of Work. Act immediately on instructions given by Observer.
- .3 When required, provide roof cut-outs and samples in field where directed by Observer and make good without additional cost to Owner.
- .4 When initial tests and observations reveal work failing to meet contract requirements, pay for any additional testing and observations required by Observer or third party testing agency for correction of Work, without additional cost to Owner.
- .5 Copies of Observation Reports issued to Owner and Prime Contractor.

1.9 DELIVERY, STORAGE, AND HANDLING

- .1 Site storage is limited. Where applicable, location of storage and related facilities to be coordinated with Prime Contractor and Owner.
- .2 All materials to be delivered and stored in their original packaging bearing manufacturers label, grade and product weight, including all other related standards, specifications, and like.
- .3 All materials to be adequately protected from inclement weather conditions and stored in a dry, well ventilated and weather protected location. Use only dry materials and apply only during weather that will not introduce moisture into roofing system.
- .4 Only materials to be installed on same day to be removed from protected location to work site.

- .5 During extreme temperature, materials to be stored in a heated location with a 4.4°C (40°F) minimum temperature and removed only as needed.
- .6 Modified bitumen rolls to be kept clear of all flames and sparks when not being applied to roof.
- .7 All materials in a rolled configuration to be stored on end, elevated off ground, and on a pallet or skid to protect bottom surface from foreign debris and moisture.
- .8 Restrict stockpiling of material in one location on roof to prevent exceeding specified deck live load capacity. Avoid point loading that may compromise structural integrity of roof.
- .9 Handle and store products in a manner to prevent damage and deterioration.
- .10 Remove and replace damaged products at own expense and to satisfaction of Consultant.

1.10 ENVIRONMENTAL REQUIREMENTS

- .1 Do not apply roofing materials to damp, wet, or frozen deck or substrates.
- .2 Do not expose materials vulnerable to water or sun damage in quantities greater than can be weatherproofed during same day.
- .3 Only install as much new roofing as can be made weather-tight each day, including all flashing and detail work. All seams to be sealed or heat welded before leaving job site that work day.
- .4 All work to be scheduled and executed without exposing interior building areas to effects of inclement weather. Existing building and its contents to be protected against all risks.
- .5 All new and temporary construction, including equipment and accessories, to be secured in such a manner as to preclude wind blow-off and subsequent roof or equipment damage.
- .6 Uninterrupted water-stops to be installed at end of each day's work and to be completely removed before proceeding with next day's work. Water-stops to not emit dangerous or unsafe fumes and to not remain in contact with finished roof as installation progresses. Contaminated membrane to be replaced at no cost to Owner.
- .7 Arrange work sequence to avoid use of newly constructed roofing as a walking surface or for equipment movement and storage. Where such access is absolutely required, provide all necessary protection and barriers to segregate work area and to prevent damage to adjacent areas. A substantial protection layer consisting of plywood over felt or plywood over insulation board to be provided for all new and existing roof areas that receive rooftop traffic during construction.
- .8 Prior to and during application, all dirt, debris and dust to be removed from surfaces by vacuuming, sweeping, blowing with compressed air, and/or similar methods.
- .9 Follow all safety regulations as required by OHS (Occupational Health and Safety) and any other applicable authority having jurisdiction.
- .10 All roofing, insulation, flashings and metal work removed during construction to be immediately taken off site to a legal dumping area authorized to receive such materials. Hazardous materials, such as materials containing asbestos, are to be removed and disposed of in strict accordance with applicable Local, Provincial, and National requirements.
- .11 All new roofing waste material (i.e., scrap roof membrane, empty cans of adhesive) to be immediately removed from site by Contractor and properly transported to a legal dumping area authorized to receive such material.

- .12 Take precautions that storage and/or application of materials and/or equipment does not overload roof deck or building structure.
- .13 Flammable adhesives and deck primers to not be stored and not be used in vicinity of open flames, sparks and excessive heat.
- .14 All rooftop contamination that is anticipated or that is occurring to be reported to manufacturer to determine corrective steps to be taken.
- .15 Verify that all roof drain lines are functioning correctly (not clogged or blocked) before starting work. Contractor to report any such blockages in writing to Consultant for corrective action prior to installation of roof system.
- .16 Immediately stop work if any unusual or concealed condition is discovered and immediately notify Consultant of such condition in writing in order to obtain additional instruction.
- .17 Site cleanup, including both interior and exterior building areas that have been affected by construction, to be completed to satisfaction of Consultant.
- .18 All landscaped areas damaged by construction activities to be repaired at no cost to Owner.
- .19 Take precautions when using adhesives at or near rooftop vents or air intakes. Avoid adhesive odours from entering building. Coordinate operation of vents and air intakes in such a manner as to avoid intake of adhesive odour while ventilating building. Keep lids on unused cans at all times.
- .20 Protective wear to be worn when using solvents or adhesives or as required by job conditions.

1.11 PREPARATORY WORK

- .1 Review roof levels and advise Consultant of any deviation from specified tolerances.
- .2 Review roof drain locations and number. Advise Consultant of any deviation or alteration from specifications.
- .3 Sweep roof deck free of dust or dirt and remove all debris prior to any installation work.

1.12 SAFETY AND PROTECTION

- .1 Solvents, Adhesives and Membranes:
 - .1 Store only enough solvents and adhesives on roof for same day use. Do not leave adhesives on roof over night. Manufacturer supplied adhesives should be stored in their over night containers. Minimum temperature for solvent based adhesives and primers is -5°C (23°F). Refer to Manufacturer's written instructions.
 - .2 Do not install roof membrane when temperature remains below 5°C (41°F) for self-adhered installations. Apply materials in accordance with manufacturer's recommendations and in accordance with Canadian Modified Bitumen Manufacturer's Association.
 - .3 Protect walls from damage where hoisting is required.
 - .4 Protect roofs from damage due to traffic and materials handling until completion.
- .2 Fire Safety:

- .1 Keep charged and ready to use fire extinguishers on site at all times, including at access to building interior, at rooftop work areas, and wherever solvent based products are stored and accessed.
- .2 Provide a minimum two (2) hour fire watch at completion of each day's activities on all projects implementing use of propane torches and/or burners.
 - .1 A handheld, infrared thermal scanner suitable for roofing applications and fire alert must be kept on site at all times during torching procedures. Fire scanner by Raytek or approved Rimkus equal. Check seams and flashings at hourly intervals for flare ups.
- .3 Health and Safety:
 - .1 Contractor to comply with all safety requirements as per current printed edition of Provincial Occupational Health and Safety Act and with Ontario Industrial Roofing Contractors Association (OIRCA) standards.

1.13 WARRANTY

- .1 Contractor Workmanship Warranty:
 - .1 On Roof Areas 1.1 and 2.1: Provide Owner with Contractor's Warranty for Workmanship on an Ontario Industrial Roofing Contractors Association (OIRCA) approved form, signed, authorized, and executed. Warranty period to be for minimum two (2) years from date of Substantial Completion.
 - .1 During Contractor's warranty term, any work related to roofing, flashing, or metal found to be defective or otherwise not in accordance with Contract Documents, to be promptly repaired by Contractor at no additional cost to Owner and in accordance with drawings and specifications. Applicator's warranty obligation to run directly to Owner with a copy sent to Manufacturer.
- .2 Roof System Warranty:
 - .1 On Roof Areas 1.1 and 2.1: Provide Owner with Manufacturer's Labour, Material and Workmanship N.D.L. (No Dollar Limit) System Warranty for a period of ten (10) years on roof replacement areas.
 - .1 Owner to notify both membrane Manufacturer and Contractor of any leak that occurs during time period while warranties remain in effect.
- .3 Cost of all warranties to be included in Contract Amount.

PART 2 - PRODUCTS

2.1 GENERAL

- .1 All membrane materials are to be supplied by Johns Manville, Siplast, or Soprema, meeting manufacturer's respective material compatibility requirements to achieve required System Warranty.
- .2 Components to be used that are other than those supplied or manufactured by membrane manufacturer may be submitted for review and acceptance by membrane manufacturer.
- .3 Membrane Manufacturer's acceptance of any other product is only for a determination of compatibility with products and not for inclusion in manufacturer's warranty.

- .4 Specifications, installation instructions, limitations, and/or restrictions of respective manufacturers must be reviewed by Consultant for acceptability for intended use with membrane manufacturer's products.

2.2 MEMBRANE PRIMER

- .1 General Purpose: Asphalt Primer to ASTM D41 Type II.
 - .1 Solvent Based Primer: Composed of volatile solvents, synthetic polymers, and/or adhesive enhancing resins to prepare surfaces for membrane application.
 - .1 JM Asphalt Primer (Black) by Johns Manville,
 - .2 PA-917 Asphalt Primer by Siplast,
 - .3 Elastocol 500 Primer (Black) by Soprema.
 - .2 High-tack for Self-adhered Membranes:
 - .1 Solvent Based Primer: Composed of volatile solvents, synthetic polymers, and/or adhesive enhancing resins to prepare surfaces for self-adhered membranes.
 - .1 JM SA Primer (Red) by Johns Manville,
 - .2 TA-325 Primer (Orange) by Siplast,
 - .3 Elastocol Stick Primer (Red) by Soprema.
 - .2 Water Based Primer: Single component resin or emulsion based primer composed with synthetic polymers and/or adhesive enhancing resins to prepare surfaces for self-adhered membranes. Not for use on metal surfaces, between membranes, or between two water repellent components.
 - .1 TA-119 Primer (Red) by Siplast,
 - .2 Elastocol 350 Primer (Dark Brown) by Soprema.
 - .3 Elastocol Stick H2O Primer (Blue) by Soprema.
- .3 For Torch Applied Membranes:
 - .1 Solvent Based Primer: Composed of SBS modified bitumen, volatile solvents, synthetic polymers, and/or adhesive enhancing resins to prepare surfaces for torch applied membranes.
 - .1 JM Asphalt Primer (Black) by Johns Manville,
 - .2 PA-917 Asphalt Primer by Siplast,
 - .3 Elastocol 500 Primer (Black) by Soprema.
 - .2 Water Based Primer: Emulsion based primer composed with SBS stabilized modified bitumen, synthetic polymers and/or adhesive enhancing resins to prepare surfaces for torch applied membranes. Not for use between membranes or two water repellent components.
 - .1 Elastocol 350 Primer (Dark Brown) by Soprema.

2.3 MECHANICAL FASTENERS

- .1 Fasteners for Deck Boards:
 - .1 Self tapping, epoxy coated carbon steel or solid stainless steel deck screws approved by membrane Manufacturer to meet warranty requirements, complete with securement plates in a fastening pattern meeting CSA A123.21 requirements.

- .2 Acceptable Product on wood roof deck:
 - .1 #12 Dekfast Fasteners by Dekfast Product Group,
 - .2 #14 All Purpose Fasteners by Johns Manville,
 - .3 #12 Parafast HD Roofing Fasteners by Siplast,
 - .4 #14 Soprafix fasteners by Soprema,
 - .5 #14 Trufast HD-SS Roofing Fasteners by Trufast.

2.4 ROOFING BOARD ADHESIVE

- .1 Polyurethane Adhesive for deck overlay, Insulation, and Cover Boards:
 - .1 Ribbons of one or two component polyurethane foamable adhesive.
 - .1 INSTA-STIK Adhesive by Flexible Products Company-Roofing Group (DOW),
 - .2 JM Two-Part Urethane Insulation Adhesive by Johns Manville,
 - .3 OlyBond500 Adhesive by OMG Roofing Products,
 - .4 Parafast Adhesive by Siplast,
 - .5 Duotack by Soprema.

2.5 DECK BOARD: GYPSUM ROOF BOARD

- .1 Deck Board: Dimensionally stable, fire resistant, gypsum based roof board with treated core for moisture and mould resistance; size no larger than 1.2m x 2.4m (4'x8').
 - .1 Glass-Mat Faced: Siliconized gypsum roof board with factory laminated glass-mat facer meeting ASTM C 1177. Boards with factory applied primer preferred.
 - .1 13mm (1/2") DensDeck Prime with EONIC technology by Georgia-Pacific,
 - .2 13mm (1/2") DEXcell FA Glass Mat Roof Board by National Gypsum (JM).
 - .2 OR Unfaced, Fibre Reinforced: Gypsum roof board with homogenous composition reinforced with cellulose fibres meeting ASTM C 1278.
 - .1 13mm (1/2") CGC Securock Gypsum-Fibre Roof Board by CGC Inc.,
 - .2 13mm (1/2") Securock Gypsum-Fibre Roof Board by USG.

2.6 VAPOUR RETARDER: 1 PLY SBS COATED POLYETHYLENE

- .1 SBS & Polyethylene Field Membrane:
 - .1 Self-adhered SBS modified bitumen membrane for steel decks 0.8mm (32 mil) thick with a tri-laminated woven polyethylene top surface and silicone release film bottom surface. Roll width to be 1.14m (45").
 - .1 Siplast SA Vapour Retarder,
 - .2 JM Vapor Barrier SA or JM Vapor Barrier SAR by Johns Manville,
 - .3 Sopravap'r by Soprema.
- .2 Vapour Retarder and Tie-in Flashings:
 - .1 Self-adhered grade modified bitumen, minimum 1.5mm (60 mil) thick, with minimum 95g/m² non-woven polyester scrim, random glass fibre mat, or composite reinforcement, impregnated and coated with SBS modified bitumen, and conforming to CSA A123.23-15. Top surface lightly sanded and self-adhesive bitumen bottom surface covered with polyolefin or silicone release film.
 - .1 DynaGrip SD/SA by Johns Manville,
 - .2 Paradiene 20 SA by Siplast,

- .3 Sopraflash Stick Duo by Soprema (Application $\geq 0^{\circ}\text{C}$),
- .4 SBS Glass SA Base by Tradesman.

2.7 BASE INSULATION: CGF POLYISOCYANURATE

- .1 Base Insulation Type: Closed-cell polyisocyanurate foam rigid insulation boards to ASTM C1289 Type II, Class 1, 2, or 3, Grade 2, manufactured with HCFC-free blowing agent (Pentane) bonded to inorganic coated glass facers on top and bottom surfaces during manufacturing process:
 - .1 Approved and listed for use with Noncombustible and FM Class 1 rated insulated roof assemblies to FM Standard 4450 on Insulated Steel Deck Roofs and FM Standard 4470 on Roof Covers for durability, wind uplift, and fire resistance.
 - .2 Meet physical property requirements of ASTM C1289 and CAN/ULC S704.
 - .3 Compressive strength: Min. 138 kPa (20 psi) to ASTM C1621, Grade 2.
 - .4 Dimensional stability change of less than 2% conforming to ASTM D2126.
 - .5 Conformity to CAN/ULC S704 and Can/ULC S770 for Long Term Thermal Resistance (LTTR) in polyisocyanurate insulation.
 - .6 Acceptable Products:
 - .1 ACFoam III polyisocyanurate by Atlas Roofing Corp.,
 - .2 Engry 3 CGF polyisocyanurate by Johns Manville,
 - .3 Paratherm CG polyisocyanurate by Siplast,
 - .4 Sopra-ISO Plus polyisocyanurate by Soprema.
- .2 Base Insulation Thickness:
 - .1 On Roof Areas 1.1 and 2.1: Continuous flat layer of polyisocyanurate insulation boards 51mm (2.0") in thickness, with butt lapped joints.
- .3 Base Insulation Panel Size:
 - .1 Flat Panels: Maximum 1.22m x 1.22m (4' x 4') when adhered to substrate.

2.8 OVERLAY INSULATION: CGF POLYISOCYANURATE

- .1 Overlay Insulation Type: Closed-cell polyisocyanurate foam rigid insulation boards to ASTM C1289 Type II, Class 1, 2, or 3, Grade 2, manufactured with HCFC-free blowing agent (Pentane) bonded to inorganic coated glass facers on top and bottom surfaces during manufacturing process:
 - .1 Approved and listed for use with Noncombustible and FM Class 1 rated insulated roof assemblies to FM Standard 4450 on Insulated Steel Deck Roofs and FM Standard 4470 on Roof Covers for durability, wind uplift, and fire resistance.
 - .2 Meet physical property requirements of ASTM C 289 and CAN/ULC S704.
 - .3 Compressive strength: Min. 138 kPa (20 psi) to ASTM C1621, Grade 2.
 - .4 Dimensional stability change of less than 2% conforming to ASTM D2126.
 - .5 Conformity to CAN/ULC S704 and Can/ULC S770 for Long Term Thermal Resistance (LTTR) in polyisocyanurate insulation.
 - .6 Acceptable Products:

- .1 ACFoam III polyisocyanurate by Atlas Roofing Corp.,
 - .2 Enrgy 3 CGF polyisocyanurate by Johns Manville,
 - .3 Paratherm CG polyisocyanurate by Siplast,
 - .4 Sopra-ISO Plus polyisocyanurate by Soprema.
- .2 Overlay Insulation Thickness: Tapered to suit layout indicated on roof plan drawing:
- .1 Taper insulation at a slope of 1%, 3mm (0.125") vertically per linear foot (305mm) horizontally, or at slopes otherwise noted on roof plan drawing.
 - .2 On Roof Area 1.1: Taper insulation to create a backslope at 1% around roof area perimeters starting at a maximum of 177mm (7.0") down to a minimum of 25mm (2.0"), where indicated on roof plan drawing. Remaining area to receive continuous flat insulation boards at a thickness of 25mm (2.0").
 - .3 On Roof Area 2.1: Taper insulation to create a backslope at 2% around roof area perimeters starting at a maximum of 254mm (10.0") down to a minimum of 25mm (2.0"), where indicated on roof plan drawing. Remaining area to receive continuous flat insulation boards at a thickness of 25mm (2.0").
- .3 Base Insulation Panel Size:
- .1 Flat Panels: Maximum 1.22m x 1.22m (4' x 4') when adhered to substrate.
- .4 Tapered Drainage Sumps: Tapered closed-cell polyisocyanurate foam rigid insulation boards with inorganic coated glass facers.
- .1 At Roof Drains: Delete section of overlay insulation to accommodate tapered sump:
 - .1 On Roof Areas 1.1 and 2.1: 2.44m x 4.88m (8' x 16') and tapered from 51mm (2.0") at outer edge down 2% to a 25mm (1.0") thickness at centre.
 - .2 On Roof Areas 1.1 and 2.1: 4.88m x 4.88m (16' x 16') and tapered from 64mm (2.0") at outer edge down 2% to 0mm (0") thickness at centre.
- .5 Tapered Insulation Supply:
- .1 All tapered insulation panels, drain sumps, and crickets to be factory cut and mitred to suit layout. Individual panels to be clearly labeled for easy identification and assembly.
 - .2 Submit shop drawings to Consultant for review prior to prefabrication and shipping.

2.9 COVER BOARD

- .1 Gypsum Cover Board: Dimensionally stable, fire resistant, gypsum based roof board with treated core for moisture and mould resistance; size no larger than 1.22m x 2.44m (4' x 8'):
 - .1 Glass-Mat Faced: Siliconized gypsum roof board with factory laminated glass-mat facer meeting ASTM C 1177. Boards with factory applied primer preferred.
 - .1 13mm (1/2") DensDeck Prime with EONIC technology by Georgia-Pacific,
 - .2 13mm (1/2") DEXcell FA Glass Mat Roof Board by National Gypsum (JM).
 - .2 OR Unfaced, Fibre Reinforced: Gypsum roof board with homogenous composition reinforced with cellulose fibres meeting ASTM C 1278.
 - .1 13mm (1/2") CGC Securock Gypsum-Fibre Roof Board by CGC Inc.,
 - .2 13mm (1/2") Securock Gypsum-Fibre Roof Board by USG.

.2 OR Base Sheet Laminated Asphaltic Board:

- .1 4.8mm (3/16") thick multi-ply, semi-rigid asphaltic roofing recovery board composed of a mineral fortified asphaltic core formed between two asphaltic saturated fibreglass liners with 2.2mm (3/32") factory laminated non-woven polyester reinforced SBS modified bitumen base sheet membrane conforming to CSA A123.23-15. Panel boards to have a membrane duo selvedge edge width of 89mm (3.5") for overlapping onto next board.
 - .1 7.0mm (9/32") 2-1 Soprasmart Board by Soprema.
- .2 Laminated Asphaltic Board Size: Flat panels, max. size 0.91m x 2.44m (3' x 8').
- .3 Laminated Asphaltic Board Surface: Thermofusible polyolefin film top surface.
- .4 Cover Strips For Base Sheet Laminated Panels: At insulation panel end joints, 330mm (13.0") wide strips of 2.5mm (3/32") thick base sheet membrane with composite reinforcement, impregnated and coated with SBS modified bitumen, and conforming to CSA A123.23-15.
 - .1 Self-adhered Application: Top surface to be lightly sanded with bottom surface covered with silicone release film; SopraLap Stick by Soprema.
 - .2 Heat Welded Application: Top surface and bottom surface covered with thermofusible polyfilm; SopraLap by Soprema.

2.10 MODIFIED BITUMEN MEMBRANE: SELF-ADHERED BASE & TORCH CAP

- .1 Two (2) ply modified bitumen membrane system for specified System Warranty.
- .2 Base Sheet Field Membrane:
 - .1 Soprema Option: Factory laminated to cover board.
 - .2 JM & Siplast Option: Self-adhered grade modified bitumen; minimum 2.5mm thick, with minimum 180 g/m² non-woven polyester scrim, random glass fibre mat or composite reinforcement, impregnated and coated with SBS modified bitumen, and conforming to CGSB 37-GP-56M. Top surface lightly sanded or self-adhesive bitumen covered with polyolefin or silicone release film and bottom surface self-adhesive bitumen covered with polyolefin or silicone release film.
 - .1 For Ten (10) Year System Warranty:
 - .1 DynaGrip Base SD/SA by Johns Manville,
 - .2 Paradiene 20 TS SA self adhered by Siplast,
- .3 Base Sheet Flashing:
 - .1 Self-adhered grade modified bitumen; minimum 2.5mm with minimum 180 g/m² non-woven polyester scrim, random glass fibre mat, or composite reinforcement, impregnated and coated with SBS modified bitumen, and conforming to CGSB 37-GP-56M. Top surface lightly sanded or self-adhesive bitumen covered with polyolefin or silicone release film and bottom surface self-adhesive bitumen covered with polyolefin or silicone release film.
 - .1 For Ten (10) Year System Warranty:
 - .1 DynaGrip P/SA by Johns Manville,
 - .2 Paradiene 20 TS SA by Siplast,
 - .3 Sopraflash Stick 40(≥10°C) or 40 LT(≥0°C) by Soprema (Duo Selvedge).

.4 Cap Sheet Field Membrane:

- .1 Torch grade modified bitumen; minimum thickness 3.3mm, with minimum 250 g/m² non-woven polyester scrim, random glass fibre mat, or composite reinforcement, impregnated and coated with SBS modified bitumen, and conforming to CSA A123.23-15. Top surface to have No. 11 ceramic granules and torch grade bitumen bottom surface covered with thermofusible polyolefin film or lightly sanded. Colour of granules to be chosen by Owner from Contractor supplied samples of standard colours.

.1 For Ten (10) Year System Warranty:

- .1 DynaWeld 250 Cap by Johns Manville,
.2 Paradiene 30 FR TG by Siplast,
.3 Sopralene Flam 250 GR by Soprema.

.5 Cap Sheet Flashing:

- .1 Torch grade modified bitumen; minimum thickness 3.3mm, with minimum 250 g/m² non-woven polyester scrim, random glass fibre mat, or composite reinforcement, impregnated and coated with SBS modified bitumen, and conforming to CSA A123.23-15. Top surface to have No. 11 ceramic granules and torch grade bitumen bottom surface covered with thermofusible polyolefin film or lightly sanded. Colour of granules to be chosen by Owner from Contractor supplied samples of standard colours.

.1 For Ten (10) Year System Warranty:

- .1 DynaWeld 250 Cap by Johns Manville,
.2 Parafor 30 TG by Siplast,
.3 Sopralene Flam 250 GR by Soprema.

2.11 LIQUID APPLIED PMMA RESIN FLASHINGS

- .1 Flexible, polymethylmethacrylate (PMMA) based resin system combined with a thixotropic agent for use in combination with fleece fabric to form a monolithic, reinforced flashing membrane:

- .1 SeamFree PMMA resin system by Johns Manville,
.2 Parapro 123 Flashing & Parapro Membrane resin system by Siplast,
.3 Alsan-RS 230 Flash & Alsan-RS 230 Field membrane resin system by Soprema.

.2 PMMA Roof Flashing Components:

- .1 PMMA Primer for vertical concrete, wood, and plywood substrates: SeamFree Flashing Primer by Johns Manville, Pro Primer W by Siplast, or Alsan-RS 276 Primer by Soprema.
- .2 PMMA Primer for horizontal concrete substrates: SeamFree Primer and Metal Primer by Johns Manville, Pro Primer T by Siplast, or Alsan-RS 276 Primer by Soprema.
- .3 PMMA Primer for asphaltic surfaces and substrates: SeamFree Primer by Johns Manville, Pro Primer R by Siplast, or Alsan-RS 222 Primer by Soprema.
- .4 PMMA Resin: Polymethylmethacrylate based resin combined with a thixotropic agent. Where applicable, resin colour to be chosen by Owner from standard pallet of available colours from manufacturer: SeamFree PMMA resin by Johns Manville, PMMA resin by Siplast, or Alsan-RS 260 LO Field and Flash resin by Soprema.
- .5 PMMA Catalyst: SeamFree Catalyst by Johns Manville, Pro Catalyst by Siplast, or Alsan-RS LO Catalyst Powder by Soprema.

- .6 Thixotropic agent: Liquid additive used to increase viscosity of PMMA-based resin products, allowing resins to be applied over vertical or sloped substrates: SeamFree Thixo Liquid by Johns Manville, Pro Thixo by Siplast, or Alsan-RS Catalyst Agent by Soprema.
- .7 Fleece reinforcement: Non-woven, 110 g/m², needle punched, polyester fabric reinforcement as supplied by system manufacturer: SeamFree Scrim by Johns Manville, Pro Fleece by Siplast, or Alsan-RS Fleece by Soprema.
- .8 Colour finish resin: Pigmented, polymethylmethacrylate (PMMA) based resin for use as a wearing coat over field of finished roof membrane and to provide a desired colour finish: SeamFree Top Coat by Johns Manville, Pro Color Finish by Siplast, or Alsan-RS 281 Finish by Soprema. Colour to be chosen by Owner from standard pallet of available colours from manufacturer.
- .9 Anti-Skid Surfacing: Ceramic granules suitable for broadcast into horizontal PMMA based wearing layer: SeamFree Textured Traffic Coat by Johns Manville, No. 11 Granules by Siplast, or Alsan-RS Surfacing Aggregate by Soprema. Colour to be chosen by Owner from standard palette of available colours.
- .3 PMMA Accessories:
 - .1 Cleaning solution/solvent: Clear solvent used to clean and prepare transition areas of in-place catalyzed resin to receive subsequent coats of resin and to clean substrate materials to receive resin: SeamFree Cleaner by Johns Manville, Pro Prep by Siplast or Alsan-RS Cleaning Agent by Soprema.
 - .2 Preparation paste: PMMA based paste used for remediation of depressions in substrate surfaces or other irregularities: SeamFree Joint/Repair Paste by Johns Manville, Pro Paste Resin by Siplast or Alsan-RS Paste by Soprema.
 - .3 Repair mortar: Two component, PMMA based, aggregate filled mortar used for remediation of depressions or patching concrete substrates: SeamFree Joint/Repair Paste by Johns Manville, Pro Repair Mortar by Siplast or Alsan-RS Repair Mortar by Soprema.
 - .4 Tape: White, flexible, coated cotton cloth tape designed for treatment of insulation panel joints, deck/wall transitions and joints in flashing substrates: SeamFree Primer by Johns Manville, Pro Tape by Siplast or approved equal from Soprema.

2.12 MISCELLANEOUS INSULATION

- .1 Batt Insulation: Non-combustible, water resistant, vapour permeable, semi rigid mineral wool batt insulation made from slag and basalt rock, conforming to CAN/ULC S702-09 with a density of 45 kg/m³ (2.8 lb/ft³).
 - .1 Rockwool AFB (Acoustical Fire Batt) by Rockwool Inc.
- .2 Extruded Polystyrene Insulation: Closed cell, Type IV (4) extruded expanded polystyrene foam insulation boards with continuous skin surface on top face and back meeting requirements of CAN/ULC S701. Minimum thickness 25mm (1.0").
 - .1 Foamular 350 or 400 series XPS by Owens Corning (Light Pink),
 - .2 Styrofoam Brand Roofmate XPS insulation by Dow (Light Cyan),
 - .3 Sopra-XPS 35 insulation by Soprema (Light Orange).

2.13 FASTENERS, PLATES & FASTENING BARS

- .1 All fasteners and plates to meet requirements of Factory Mutual Global 4470 Standard for wind uplift and corrosion resistance in roofing.
- .2 Wood to steel, wood to wood or steel to steel:
 - .1 Tru-Fast Ultra Solid Stainless Steel fastener or equal approved by membrane Manufacturer, to penetrate substrate by minimum 19mm (3/4").
- .3 Wood/steel to concrete or concrete block:
 - .1 Perma-Grip Tap Grip H.D. Truss Head fastener with Perma-Coat Z3 corrosion protection or equal approved by membrane Manufacturer, to penetrate substrate by 32mm (1 1/4").
 - .2 Tru-Fast Tap Grip H.D. Truss Head fastener with Perma-Coat Z3 corrosion protection to penetrate substrate by 32mm (1 1/4").
- .4 Steel/aluminum to aluminum:
 - .1 Tru-Fast DP with Trucote PC-3 corrosion protection fastener c/w EPDM galvanized steel sealing washers or equal approved by membrane Manufacturer, to penetrate substrate by 19mm (3/4").
- .5 Termination bar for membrane:
 - .1 Extruded aluminum, 1.5mm (0.060") thick x 25mm (1") wide x 3.05m (10') long with 6mm x 9.5mm (1/4" x 3/8") slotted holes on 203mm (8") o/c. Acceptable material: TB-120 aluminum termination bar by Tru-Fast or equal approved by membrane Manufacturer.
- .6 Termination bar fastener for wood, steel or aluminum:
 - .1 Tru-Fast Ultra Solid Stainless Steel fastener to penetrate substrate by 19mm (3/4") c/w EPDM galvanized steel sealing washers or Construction Fasteners Inc. Woodgrip #14 screw complete with Sentri coating on threads, Chromagard colour match head and EPDM washer, or equal approved by membrane Manufacturer,
- .7 Termination bar fastener for concrete or masonry:
 - .1 Tru-Fast Tap Grip Truss Head fastener with Perma-Coat Z3 corrosion protection or equal approved by membrane Manufacturer, to penetrate substrate by 32mm (1 1/4") c/w EPDM galvanized steel sealing washers.
- .8 Pre-painted metal flashing to steel or wood:
 - .1 #14 Colormate fasteners by Leland Industries, Construction Fasteners Inc. Woodgrip #14 screw complete with Sentri coating on threads and Chromagard colour match heads with EPDM washer, or equal approved by membrane Manufacturer, to penetrate substrate by minimum 19mm (3/4").
- .9 Membrane to wood:
 - .1 Galvanized round top roofing nails with minimum 25mm (1") diameter heads or plate and head combination, to penetrate substrate a minimum 32mm (1 1/4").

2.14 ROOFING ACCESSORIES

- .1 Pitch Pockets/Pans: Pourable sealer pocket style penetration flashings are prohibited, unless specially indicated by Consultant.

- .2 Roofing accessories to be manufactured and prefabricated from spun aluminum or copper by Platinum Plus or Thaler Metal Industries Inc.
 - .1 New Roof Drains: Spun copper roof drains with internal plumbing and hook-up to existing storm water drainage system, complete with cast aluminum strainer domes, deck clamping rings, brass ferrules, M-J couplings with stainless-steel gear clamps, all related hardware, and interior plumbing required.
 - .2 Retrofit Roof Drain Inserts: Spun copper roof drain inserts to suit size of existing pipes, complete with cast aluminum strainer domes, U-Flow seal connectors, control flow weirs, and all related hardware required.
 - .3 Spun Aluminum Flashings: Model and size to suit conduit and pipe penetrations through roof or as required to support mounted equipment or accessories.
 - .1 Flanges to be 102mm (4") wide and primed with compatible rubberized asphalt.
 - .2 Spun flashing heights to be minimum 178mm (7").
 - .3 Units to have factory applied, interior spray urethane foam insulation on interior where applicable to minimize condensation.
 - .4 Units to have removable metal caps where applicable.
- .3 Membrane Tools: Use tools, hand rollers, weighted rollers, squeegees, etc. as recommended by membrane Manufacturer for installation of their product to ensure compatibility and avoid damaging of pressure sensitive membranes.
- .4 Pourable Sealer: Elastomeric pourable sealer as recommended by manufacturer.
- .5 Sealing Compound: Rubberized sealing compound to CAN/CGSB-37.29, rubber asphalt type.
 - .1 Sopramastic by Soprema,
 - .2 MBR Utility Cement by Johns Manville,
 - .3 PS-209 Elastomeric Sealant by Siplast.
- .6 Firestop Sealant: One component, neutral cure silicone sealant meeting ASTM E84 and CAN4-S115M, designed for firestop applications at joints and through-wall penetrations; TREMstop Fyre-Sil silicone sealant (red) by Tremco or Rimkus approved equal.
- .7 Spray Foam Insulation: One or two component polyurethane spray foam insulation. Use low pressure expanding spray foam insulation at force sensitive areas.
- .8 Fire Rated Spray Foam: Two component, fire rated (2 Hour) polyurethane spray foam insulation; Fire Barrier FIP-1Step by 3M.
- .9 Cold Applied Mastic: Trowel grade, asbestos-free plastic cement composed of bitumen, solvents, and mineral fillers for use with bituminous waterproofing membranes.
 - .1 MBR Utility Cement by Johns Manville,
 - .2 PA-828 Flashing Cement by Siplast,
 - .3 Sopralastic 110 by Soprema.
- .10 Sheet Metal Flashings and Trim: Fabricated from 24-gauge prepainted steel with 22-gauge hook strips to Section 07 62 00. New flashing colour to match existing.
- .11 Sealants: To Section 07 92 00 with colour of new sealant to match component applied against.

- .12 Sacrificial Protection Membrane: Self adhered or cold applied squares of matching cap sheet membrane under all bases and footings of rooftop supports and equipment set on roof membrane. Custom cut to suit base or footing size with min. 51mm (2.0") extension on all sides.

PART 3 - EXECUTION

3.1 WORKMANSHIP

- .1 Perform roofing work which is not specifically covered by these Specifications in accordance with applicable industry standards and good roofing practices of:
 - .1 Canadian Roofing Contractors Association (CRCA),
 - .2 Canadian Modified Bitumen Manufacturer's Association's recommendations,
 - .3 Manufacturer's preprinted and published technical specifications,
 - .4 ULC Design No. S-107 criteria,
 - .5 Factory Mutual Global design criteria FM 1-28 and 1.49,
 - .6 Compliance with local fire insurance requirements,
 - .7 Compliance with local building codes.
- .2 Procedures for application of materials should be in accordance with Manufacturer's printed instructions and recommendations.
 - .1 Advise Consultant of adjustments to specified roofing procedures recommended by Manufacturer or due to site conditions.
 - .2 Written approval by Consultant is required to make any adjustments to specified procedures.
- .3 All work to be carried out in accordance with drawings, and specifications provided.
 - .1 All supplied drawings and details constitute acceptable installations. Any deviance from these details must first approved by Consultant prior to installation.
- .4 While work is in progress, all steps must be taken to safeguard building from damage due to weather, fire, and structural overloading.
- .5 Examine underside of roof deck when installing mechanical fasteners, where possible, to avoid accidental damage to existing services.
- .6 Apply each part of roofing system when surfaces are free of moisture for successful application.
- .7 Do priming for asphalt roofing in accordance with CAN/CGSB 37-GP-15M and as recommended by membrane manufacturer.
 - .1 Adhesives or sealants and liquid primers will not be applied until surfaces are dry.

3.2 EXAMINATION OF SITE CONDITIONS

- .1 Examine existing site conditions and substrates upon which work of this section is dependent. Report to Consultant in writing any defects or discrepancies. Commencement of work implies acceptance of existing conditions and assumption of full responsibility for finished condition of work.
- .2 Defective work resulting from application to unsatisfactory conditions will be considered responsibility of those performing work of this section.

3.3 PROTECTION

- .1 Adjacent Buildings and Tenants:
 - .1 Take care to not damage any adjacent or closely located buildings and all related grounds in vicinity of Work during roofing operations.
 - .2 Protect against infiltration of dust, debris, and other such contaminants and occurrences.
 - .3 Locate garbage chutes to minimize exposure to adjacent building, its grounds, and its occupants.
 - .4 Protect walls by means of tarpaulins where garbage chutes and hoisting equipment are located and operated.
 - .5 Cover dumpsters and bins to prevent debris from blowing away.
 - .6 Do not use spray installation methods on days with significant wind.
 - .7 Damage to adjacent buildings, grounds, and vehicles to be rectified by Contractor at no additional cost.
- .2 Adjacent Roof Areas and Completed Work:
 - .1 Take care not to damage any previously performed work or existing roofs.
 - .2 If work area is accessed across existing roof areas, provide protection to existing roof system. Use continuous Protection Walkways consisting of 19mm (0.75") plywood sheathing over 38mm (1.5") extruded polystyrene insulation.
 - .3 Protect newly installed roof work from traffic and damage using Protection Walkways where warranted by traffic requirements.
 - .4 Comply with any precautions deemed necessary by Consultant.
- .3 Material Storage:
 - .1 Deliver all materials to site in undamaged condition with original manufacturer's label intact and clearly visible for easy verification of specified materials.
 - .2 Provide security fencing at all times for equipment and materials stored at ground level.
 - .3 Protect rolls from flattening by storing on ends on skids.
 - .4 Whenever possible, store roof materials off roof at designated, protected storage area.
- .4 Structural Integrity of Roof:
 - .1 Use only equipment that will not adversely affect, damage, or otherwise alter roof deck.
 - .2 DO NOT STRUCTURALLY OVERLOAD ROOF DECK WITH STORAGE PILES OF STONE BALLAST AND CONCRETE PAVERS ON ROOFTOP.
 - .3 Ensure weight of paver and stone ballast is adequately distributed across roof at all times, or temporarily remove ballast from roof and store at ground level staging area.
 - .4 Immediately separate and reorganize pallets of stacked concrete pavers hoisted or carried to roof. Spread Dead Load out across roof and concentrate loading over structural members. Expect roofs to have less reserve load capacity in winter.

- .5 Inclement Weather:
 - .1 Immediately halt work during inclement weather, including but not limited to rain fall, snow, drizzle, fog, and hail. Protect exposed building substrates, open building cavities, and moisture sensitive products.
 - .2 At end of each work day or when stoppage occurs due to inclement weather, provide suitable protection from elements for completed work and materials out of storage.
 - .3 Place in to heated storage any temperature sensitive materials such as membranes, adhesives, and sealants when temperature falls below 5 °C (40 °F).
 - .4 Protect all vents, stacks, drains and related deck openings from inclement weather and contamination from debris.
- .6 Roof Safety, Access, and Egress:
 - .1 Use warning signs and barriers. Maintain in good order until completion of work.
 - .2 Access to roof to remain unobstructed.
 - .3 Keep doorways and fire routes clean and clear of any obstacles.
 - .4 Protect and safeguard all man-size or larger openings in roof deck with warning flags and suitable temporary barriers or railings.
- .7 Damage and Defective Work:
 - .1 Avoid use on roof of any petroleum based and other chemical products that are corrosive and/or damaging to membrane. Provide protection to membrane from any accidental spills or drips. Any damage to roof system caused by non-compatible products to be cut out and replaced at no cost to Owner.
 - .2 Investigate and examine any damage caused by execution of Work for this contract, and repair or replace with new materials to match original finish. Restoration and repair work to be reviewed and approved by Consultant.
 - .3 Defective Work resulting from application of material on unsatisfactory surface or substrate to be rectified by Contractor at no additional cost.
 - .4 Defective Work resulting from improper installation of materials to be rectified by Contractor at no additional cost.

3.4 SURFACE PREPARATION

- .1 Preparation:
 - .1 Examine all roof decks and existing site conditions to ensure that they are in satisfactory condition for commencement of work in this section.
 - .2 Divide work into logical sections and only tear-off as much existing roof as can be made watertight in same working day to prevent damage to building interior.
 - .3 Prior to removal of any roof components, all existing openings (drains, vents, air intakes, etc.) to be covered or plugged to prevent any debris or contaminate from entering building below. All such coverings are to be removed at end of each working day and reinstalled prior to next day's start up.
 - .4 Disconnect and reconnect Electrical Services and Mechanical Equipment as required.

- .1 Rooftop equipment requiring disconnection and reconnection to be responsibility of Contractor unless otherwise specified elsewhere in contract documents or in consultation with Owner.
- .2 Include for modifications required to existing rooftop curbs and supports and related cabling, conduits, cable trays, ductwork, etc. as required to suit height of new finished roof system.
- .2 Existing Roof Removal:
 - .1 On Roof Areas 1.1 and 2.1: Remove existing roof system components down to expose existing roof deck in preparation for installation of new roof system.
 - .2 At areas designated for roof removal and replacement, remove existing projection and perimeter metal flashings, ballast, gravel, roof membrane and flashings, insulation, vapour retarder and flashings, and old appurtenances. Dispose removed items to an appropriate site for building material waste.
 - .3 All unused and abandoned pitch pockets, vents, curbs, sleepers, projections, etc. are to be removed from designated areas and disposed of.
 - .1 Obtain verification and authorization from Client before removing and disposing of any suspected unused or abandoned projections.
 - .2 Install new roof decking as required to close off any deck openings prior before proceeding with new roof system installation.
 - .3 Where existing insulation is exposed, examine insulation for any damage and deterioration required to be cut out and repaired with new compatible materials.
- .3 Substrate Review:
 - .1 Exposed roof deck surfaces to be reviewed by Contractor with Consultant. Ensure to review entire roof area to satisfy any warranty requirements of Manufacturer of new roof membrane system.
 - .1 Notify Consultant of review at least forty-eight (48) hours prior to site review.
 - .2 Report any anomalies found that may impact soundness and structural integrity of roof system to Consultant and Owner immediately. Areas with damaged decking must be replaced or repaired before any further work may take place on that particular section.
 - .3 Ensure roof decks are firm, straight, smooth, dry, free of snow, ice, frost, oils, or other contaminants. Decking must be properly cleaned of any dust and debris prior to proceeding with new installation. Test whether specified adhesion to deck will be obtained where required.
 - .4 Prior to application of vapour retarder, examine deck and ensure any defect of level or construction is correct before proceeding with work.
 - .5 Verify that roof drains have been installed at proper elevations relative to finished roof surface to allow for sufficient drainage of roof surface.
 - .6 Review securement of existing projections and equipment (electrical conduit, gas lines, etc.). If inadequate securement is found, inform Consultant and halt work around that area until situation is rectified.

- .7 Review securement of existing plywood sheathing, wood blocking, and cant strips. Do not install new roofing unless such items are adequately secured to withstand stresses imposed by thermal movement of new roofing components.

3.5 CARPENTRY

- .1 On Roof Areas 1.1 and 2.1: Refer to drawings for carpentry requirements. Install wood blocking, plywood, and cant strips to accommodate required slopes, insulation, membranes, and finish sheet metal and trim. Carpentry alterations to be performed to accepted trade practices.
 - .1 Mechanically fasten new 13mm (0.5") plywood sheathing or 6mm (0.25") Densdeck Prime roofing board over all EPDM membrane or adhesive left in place at roof perimeters, sleepers, curbs, and overtop of parapets.
- .2 Add new wood blocking as necessary to maintain minimum heights at perimeters and roof curbs.
 - .1 At Existing Roof Curbs: Minimum height to be 203mm (8") above finished roof membrane and at least 51mm (2.0") higher than adjacent roof perimeters, up to a maximum 460mm (1'-6") above finished roof membrane.
 - .1 At metal roof curbs: Where extension height required is greater than 102mm (4.0"), install new galvanized metal C-Channel, prefab curb extension, or prefab curb adapter or reducer to raise curb as required to suit new height.
 - .2 At Existing Parapets: Minimum height to be 102mm (4") above finished roof membrane, unless otherwise indicated on detail drawings.
- .3 Replace any damaged or deteriorated wood at perimeters and projections with new construction grade spruce wood blocking or exterior grade plywood, good one side, to match existing. Determination of suitability to reuse or replace existing wood to be by Observer.
 - .1 Ensure existing wood blocking remaining at perimeters and curbs is securely fastened to existing substrate before installing new wood blocking and plywood.
- .4 Install wood blocking as required to ensure that all roof curbs and sleepers supporting HVAC and mechanical equipment are level.
- .5 Wood to wood, wood to metal, wood to masonry or concrete to be secured at 305mm (12") on center with alternating fasteners staggered.
 - .1 Avoid protruding fastener heads. Where possible, all fasteners to be flush with or slightly sunk below surface of wood blocking being secured.
- .6 All wood blocking and plywood to be considered part of roof, and to be made watertight by end of each work day to eliminate moisture infiltration into roof system.
- .7 On Roof Area 2.1, install new insulated stud wall divider/control joint.

3.6 DECK OVERLAY BOARD

- .1 On Roof Area 1.1: Adhere a layer of deck overlay board in beads of polyurethane foamable roofing adhesive to metal roof deck as per manufacturer's written instructions to meet CSA A123.21 requirements.
 - .1 Non-Asphaltic adhesive primer may be used to increase adhesion to metal deck or on highly absorbent substrates. Consult Manufacturer on use of suitable epoxy coatings, chlorinated rubber, wash primer or other adhesive primers.
- .2 Do not use wet or damaged deck overlay panels. Panels must be dry for proper installation.

- .3 Custom cut deck overlay boards at perimeters and projections to suit. Install boards tightly together with no gaps between adjacent boards larger than 3mm (0.125").
 - .1 Cut boards as required to fit snug at all perimeters, walls, and roof projections.
 - .2 Cut straight lines using proper tools and snap chalk lines.
 - .3 Cut boards cleanly where slope changes direction. Do not break boards by stepping on them to acquire changes in deck slope.
- .4 Install continuous ribbons of polyurethane adhesive in parallel lines centered over top of deck flutes or ribs to meet CSA A123.21 requirements. Where possible, use a "Z" pattern over an application area no larger than 3.66m (12'-0") at a time to minimum securement pattern:
 - .1 Adhesive ribbons to be no less than 13mm (1/2") to 19mm (3/4") in width at time of application.
 - .2 Parallel rows of adhesive ribbons to be no more than 152mm (6") apart in field of roof.
 - .3 Rows of adhesive to be no more than 102mm (4") apart in corner zones.
 - .1 Roof Area 1.1 and 2.1, corner zone 12'x12'.
- .5 Do not allow rising foam adhesive to skin over. Place roof board panels immediately into wet adhesive.
- .6 Where cover board is field primed, allow sufficient time for applied primers to dry and flash-off. Roof board surface must be thoroughly dry before installation of membrane.

3.7 DECK OVERLAY BOARD

- .1 On Roof Area 2.1: Mechanically fasten a layer of deck overlay boards with deck screws and securement plates to wood roof deck to meet CSA A123.21 requirements.
- .2 Do not use wet or damaged deck overlay panels. Panels must be dry for proper installation.
- .3 Custom cut deck overlay boards at perimeters and projections to suit. Install boards tightly together with no gaps between adjacent boards larger than 3mm (0.125").
 - .1 Cut boards as required to fit snug at all perimeters, walls, and roof projections.
 - .2 Cut straight lines using proper tools and snap chalk lines.
 - .3 Cut boards cleanly where slope changes direction. Do not break boards by stepping on them to acquire changes in deck slope.
- .4 Install sheet panels over metal decking with long axis of each sheet perpendicular to direction of deck flutes or ribs.
 - .1 Mechanical fasteners to penetrate top flutes only, by no less than 19mm (3/4") and by no more than 32mm (1.25").
 - .2 Check underside of metal deck before installation to eliminate damaging any existing conditions below deck.
 - .3 Install 1 fastener per square foot of 4'x8 board for a total of 32 fasteners.
- .5 Align side edges of roof board panels over center of top deck flutes.

- .6 Butt sheets tightly together with end joints staggered by half width of sheet.
- .7 Where cover board is field primed, allow sufficient time for applied primers to dry and flash-off. Roof board surface must be thoroughly dry before installation of membrane.

3.8 VAPOUR RETARDER

- .1 On Roof Areas 1.1 and 2.1: Install one (1) ply self-adhered vapour retarder membrane and flashing as per manufacturer's written instructions, free of blisters, wrinkles and fish-mouths. Installation to be free of blisters, wrinkles and fish-mouths.
 - .1 Vapour retarder must be installed on same day as primer application.
 - .2 Do not install when it is raining or snowing, on wet/humid surfaces, or when inclement weather is expected shortly.
 - .3 Complete, new roof assembly to be installed on a daily basis, vapour retarder not to be left exposed over night.
- .2 Primer Installation:
 - .1 Prime all non-metal exposed surfaces to receive vapour retarder membrane and flashing. Apply primer to clean and dry surfaces with a paint brush, roller or sprayer at temperatures 0°C (31°F) and above.
 - .2 Apply primer at a coverage rate between of 0.1 to 0.5 L/m² (0.25 to 1.22 gallon/100 ft²) as recommended by membrane manufacturer for surface type.
 - .3 Ensure all substrates are fully covered with primer leaving no areas bare and avoid pooling.
 - .4 Allow primer to dry completely prior to installation of new vapour retarder membrane.
- .3 Field Membrane Installation:
 - .1 Begin application at bottom of roof slope. Unroll self-adhered membrane onto substrate without adhered for alignment. Do not immediately remove release film.
 - .2 On metal deck areas: Roll out membrane parallel to directions of deck flutes.
 - .3 Overlap each preceding sheet by a minimum of 76mm (3") lengthwise following reference chalk line and by a minimum of 152mm (6") at each end. Stagger end laps by at least 305mm (12").
 - .4 Over exposed metal decking: At roll end laps, install a 152mm x 1.07m (6" x 42") 22 gauge metal plate to support overlapping end joints across flute spaces. Overlap membrane end joints by 152mm (6") and ensure full seal.
 - .5 Once aligned, peel back a portion of release film and press membrane onto substrate for initial adherence. Hold membrane tight and peel back release film by pulling diagonally.
 - .6 Use a manufacturer recommended weighted roller to press membrane down into substrate including laps. Finish by aligning edge of roller with lower end of side laps and rolling up membrane.
 - .7 Do not cut membrane to remove air bubbles trapped under laps. Squeeze out air bubbles by pushing roller to edge of laps.

- .8 Carry vapour retarder up all vertical surfaces at parapets and projections where indicated on detail drawings.
- .4 Membrane Flashing Installation:
 - .1 Prime substrate to receive self-adhered base sheet flashing with primer and rate of application as recommended by manufacturer. Avoid pools and heavy areas and allow primer to dry a minimum 30 minutes or until staining does not occur to touch and surface becomes tacky.
 - .2 Ensure complete coverage of primer to both prepared substrates and to field sheet membrane prior to placement of membrane flashing.
 - .3 Install membrane flashing onto substrate in strips one membrane roll wide (40" or 1m) and extend over perimeters as shown on detail drawings
 - .4 Field measure and cut flashing membrane to length required for flashing at each detail and roll up for installation. Allow for encapsulating of new insulation with roof membrane.
 - .5 Unroll and install membrane flashing onto substrate by removing release paper and discarding.
 - .6 Using weighted roller as recommended by manufacturer, roll all surfaces of roof membrane to ensure continuous adhesion with membrane to substrate. Firmly press membrane into substrate to ensure proper bond.
 - .7 Lap membrane flashing onto field membrane a minimum 152mm (6"). Side laps between adjacent sheets to be a minimum of 127mm (5") wide.
 - .8 INSTALL MEMBRANE GUSSET REINFORCEMENT AT ALL INSIDE AND OUTSIDE CORNERS ON TOP OF BASE SHEET MEMBRANE.
 - .9 Install vapour retarder tie-in flashings between new vapour retarder and roof membrane at projections and curbs and where indicated in detail drawings.

3.9 BASE INSULATION

- .1 On Roof Areas 1.1 and 2.1: Install a layer of base insulation boards over prepared vapour retarder in accordance with insulation manufacturer's instructions.
- .2 Where applicable, install tapered base insulation according to layout on reviewed shop drawings and roof plan drawing(s). Report any discrepancies to Consultant before proceeding.
- .3 Do not install more insulation board than can be covered with membrane by end of work day or before onset of inclement weather.
- .4 Do not install warped, curled, damaged, or wet insulation boards.
- .5 Install base insulation boards in parallel rows and butt tightly together with joints staggered by one half board length.
 - .1 Where multiple layers of insulation are required, stagger all board joints at least 305mm (12") between rows.
- .6 On Roof Areas 1.1 and 2.1: Adhere base insulation to substrate using continuous beads of polyurethane foamable roofing adhesive. Follow manufacturer's installation instructions.

- .1 Install continuous ribbons of polyurethane adhesive in parallel lines to meet CSA A123.21 requirements. Use a "Z" pattern over an application area no larger than 3.66m (12'-0") at a time. Minimum securement pattern:
 - .1 Adhesive ribbons to be no less than 13mm (1/2") to 19mm (3/4") in width at time of application.
 - .2 parallel rows of adhesive ribbons to be no more than 152mm (6") apart in field and perimeters of roof.
 - .3 Rows of adhesive to be no more than 152mm (6") apart in corner zones.
 - .1 Roof Area 1.1 and 2.1, corner zone 12'x12'.
- .2 Do not allow rising foam adhesive to skin-over. Place insulation panels immediately into wet adhesive.
- .3 Walk-in board panels to ensure positive adhesion of substrate across full panel. Repeat walk-in every five (5) minutes until insulation is firmly attached.
 - .1 Upon placement of insulation board, immediately weight down each board, using weighted pails. Apply one pail in the center of each board.
 - .2 Each layer to be weighted down as it is set in place. Pails to be left in place until adhesive has fully cured.
- .7 Custom cut insulation boards as required at perimeters and projections to suit. Field cuts to be neat and provide tight fit around penetrations, projections, and at perimeters.
- .8 For uneven surfaces, trimming or slitting of boards may be necessary. Fill all gaps larger than 3mm (1/8") with insulation slivers or continuous spray polyurethane foam insulation to ensure thermal barrier continuity.

3.10 OVERLAY INSULATION

- .1 On Roof Areas 1.1 and 2.1: Install a continuous layer of overlay insulation boards over base insulation in accordance with insulation manufacturer's instructions.
- .2 Where applicable, install tapered overlay insulation according to layout on reviewed shop drawings and roof plan drawing(s). Report any discrepancies to Consultant before proceeding.
- .3 Do not install more insulation board than can be covered with membrane by end of work day or before onset of inclement weather.
- .4 Do not install warped, curled, damaged, or wet insulation boards.
- .5 Install overlay insulation boards in parallel rows and butt tightly together with joints staggered by one half board length.
 - .1 Where multiple layers of insulation are required, stagger all board joints at least 305mm (12") between rows.
- .6 On Roof Areas 1.1 and 2.1: Adhere overlay insulation to substrate using continuous beads of polyurethane foamable roofing adhesive. Follow manufacturer's installation instructions.
 - .1 Install continuous ribbons of polyurethane adhesive in parallel lines to meet CSA A123.21 requirements. Use a "Z" pattern over an application area no larger than 3.66m (12'-0") at a time. Minimum securement pattern:

- .1 Adhesive ribbons to be no less than 13mm (1/2") to 19mm (3/4") in width at time of application.
- .2 parallel rows of adhesive ribbons to be no more than 152mm (6") apart in field and perimeters of roof.
- .3 Rows of adhesive to be no more than 152mm (6") apart in corner zones.
 - .1 Roof Area 1.1 and 2.1, corner zone 12'x12'.
- .2 Do not allow rising foam adhesive to skin-over. Place insulation panels immediately into wet adhesive.
- .3 Walk-in board panels to ensure positive adhesion of substrate across full panel. Repeat walk-in every five (5) minutes until insulation is firmly attached.
 - .1 Upon placement of insulation board, immediately weight down each board, using weighted pails. Apply one pail in the center of each board.
 - .2 Each layer to be weighted down as it is set in place. Pails to be left in place until adhesive has fully cured.
- .7 On Roof Areas 1.1 and 2.1: At existing roof drain locations, delete a section of base insulation in a 2.44m x 4.88m (8' x 16') area centered around each drain.
 - .1 At each drain location, install a new 2.44m x 4.88m (8' x 16') prefabricated, tapered insulation drain sump over prepared substrate.
- .8 On Roof Areas 1.1 and 2.1: At existing roof drain locations, delete a section of base insulation in a 4.88m x 4.88m (16' x 16') area centered around each drain.
 - .1 At each drain location, install a new 4.88m x 4.88m (16' x 16') prefabricated, tapered insulation drain sump over prepared substrate.
- .9 Custom cut insulation boards as required at perimeters and projections to suit. Field cuts to be neat and provide tight fit around penetrations, projections, and at perimeters.
- .10 For uneven surfaces, trimming or slitting of boards may be necessary. Fill all gaps larger than 3mm (1/8") with insulation slivers or continuous spray polyurethane foam insulation to ensure thermal barrier continuity.

3.11 COVER BOARD

- .1 On Roof Areas 1.1 and 2.1: Install a layer of cover board panels in ribbons of polyurethane foamable roofing adhesive over rigid insulation as per manufacturer's written instructions and to meet CSA A123.21 requirements.
- .2 Install cover board panels in parallel rows and butt tightly together with end joints staggered by a half width of panel. Stagger panel end joints with joints of rigid insulation below by min. 152mm (6").
 - .1 Install continuous ribbons of polyurethane adhesive in parallel lines to meet CSA A123.21 requirements. Use a "Z" pattern over an application area no larger than 3.66m (12'-0") at a time. Minimum securement pattern:
 - .1 Adhesive ribbons to be no less than 13mm (1/2") to 19mm (3/4") in width at time of application.

- .2 parallel rows of adhesive ribbons to be no more than 152mm (6") apart in field and perimeters of roof.
- .3 Rows of adhesive to be no more than 152mm (6") apart in corner zones.
 - .1 Roof Area 1.1 and 2.1, corner zone 12'x12'.
- .2 Do not allow rising foam adhesive to skin over. Place roof board panels immediately into wet adhesive.
- .3 Walk-in board panels to ensure positive adhesion to substrate across full panel. Repeat walk-in every five (5) minutes until insulation is firmly attached.
 - .1 For improved adhesion with semi-rigid cover boards, roll cover board panels using weighted roller to press board into expanding adhesive foam.
 - .2 For improved adhesion with rigid cover boards, temporarily place minimum of four (4) equally spaced weighted pails on each cover board panel and leave for min. ten (10) minutes during rise and set of adhesive foam.
- .3 Do not use wet or damaged cover board panels. Panels must be dry for proper installation.
- .4 Determine and mark, as required, areas to receive new cover board installation to avoid over application of quick adhesive.
- .5 Custom cut cover board panels at perimeters and projections to suit. Install cover boards tightly together with no gaps between insulation boards larger than 3mm (0.125").
 - .1 Cut boards as required to fit snug at all perimeters, walls, and roof projections.
 - .2 Cut straight lines using proper tools and snap chalk lines.
 - .3 Cut boards cleanly where slope changes direction. Do not break boards by stepping on them to acquire changes in deck slope.
- .6 Where cover board is field primed, allow sufficient time for applied primers to dry and flash-off. Roof board surface must be thoroughly dry before installation of membrane.
- .7 With Base Sheet Laminated Panels:
 - .1 Side Laps: Adhere and heat weld with hot air gun or torch to satisfaction of Observer all side laps of modified bitumen base sheet membrane.
 - .2 End Joints: Install 330mm (13") wide self-adhered, modified bitumen base sheet cover strips centered over panel end joints. Cover strips to extend a min. of 152mm (6") past each side of end joint.
 - .3 Ensure all laps and seams in base sheet membrane are well bonded to form a single continuous waterproof membrane barrier.

3.12 MODIFIED BITUMEN MEMBRANE APPLICATION

- .1 On Roof Areas 1.1 and 2.1: Install a two (2) ply, SBS modified bitumen membrane system overtop of prepared metal deck. Base sheet layer to be self-adhered with self-adhered flashings. Cap sheet layer and cap sheet flashings to be torch applied.
 - .1 Soprema Option: Base sheet field membrane factory laminated to Cover Board.

- .2 All membrane materials are to be supplied by same manufacturer in order to meet material compatibility requirements necessary to achieve required System Warranty.
- .3 All membrane installations to conform to membrane manufacturer's printed literature, recommendations, guidelines, and instructions.
- .4 All membrane and flashing applications to be free of sags, blisters, wrinkles, and fish-mouths.
- .5 General Requirements for Application:
 - .1 Tools, Rollers, & Squeegees: Use membrane manufacture's recommended tools and accessories. Keep tools clean during performance of work and frequently replace application roller tips and squeegee heads with new when clogged.
 - .2 Surface Review: Apply over wood, metal, gypsum board and concrete decks which are clean, smooth, and free of snow, ice, moisture, and debris. Concrete decks must have all holes filled with quick drying cement and rough patches removed.
 - .3 Application of Primer: Priming is required for all substrates prior to installation. Avoid pooling primer and allow to completely dry before membrane installation. Drying time will vary according to absorptive qualities of material and ambient weather conditions.
 - .4 First Roll Starting Point: Base sheet to begin at drain level with side lap aligned to centre of drain. Run rolls perpendicular to slope. Cap sheet to be installed over base sheet covering base sheet overlap. Center of cap sheet to align up with centre of drain.
 - .5 Relaxing of Roll Membrane: ALL ROLL MEMBRANES ARE TO BE FULLY UNROLLED AND ALLOWED TO RELAX FOR A MIN. OF 15 MINUTES PRIOR TO INSTALLATION. Wait longer in cooler temperatures. Trace zig-zag pattern with torch as recommended by manufacturer over membranes that are covered with thermal-fusible film.
 - .6 Alignment of Rolls: Completely unroll first roll and align with edge of roof. Reroll membrane from both ends to centre and apply as per specifications.
 - .7 Staggering of Sheets: End laps between base and cap sheets to be offset a min. of 610mm (24"). Side laps between base and cap sheets to be offset a min. of 305mm (12"), centered alignment preferred. Laps in same membrane layer to be min. 76mm (3") wide for side laps and min. 305mm (12") wide for end laps. When salvage side laps of base and cap sheets are unequal, adjust cap roll width occasionally to maintain alignment.
 - .8 Procedure to Seal Voids: Where voids are created by overlapping rolls of membrane, cut off corner of salvage edge where covered by next roll of material.
 - .9 Salvage Edge Protection: Granules along edge of membrane to be primed prior to application of adhesive to provide good adhesion of laps.
 - .10 Membrane Flashings: Base flashings to extend min. 102mm (4") onto field of roof. Cap flashings to overlap base sheet flashings and extend min. 152mm (6") onto field or roof. Use wider overlap widths where required by manufacturer for warranty requirements.
 - .11 Bleed-Out at Seams: When torch applying membrane, provide consistent, continuous bleed-out along all seams, no less 3mm (1/8") and no greater than 6mm (1/4") in width.
 - .12 All Seams: Check all seams in all sheets with a round nosed trowel while work is in progress. Repair found deficiencies immediately and before continuing roof installation.

- .13 Base Sheet Seams: Butter all seams and laps. Provide additional bitumen at point of 90° upturns in base sheet flashings. Recheck self-adhered membrane seams left exposed within forty-eight (48) hours of installation to repair any revealed seam deficiencies with clean, heated trowel.
- .14 Cap Sheet Seams: At all end laps and membrane flashing overlaps, degranulate area (embed granules) of surface to be bonded by embedding ceramic granules into bitumen of membrane using clean, heated trowel to push in. Measure and use straight chalk lines to mark outline of areas requiring degranulation. Achieve a uniform black surface of bitumen across 100% of embedment areas to be overlapped.
- .15 Reinforcement: Required at all corners, vents, drains, HVAC units, and gravel stops.
- .16 Primer Application: Sanded membrane left exposed overnight or longer to be primed before continuing membrane installation to ensure good adhesion.
- .17 Torch Application: During windy periods, slow application rate down to ensure good bond with proper level of heat. Stop and periodically check for proper adhesion.
- .6 Correction Requirements for Defects and Deficiencies:
 - .1 Delamination: Membrane may not be fully bonded to substrate due to:
 - .1 Moisture present on substrate,
 - .2 Dirt, dust, or other contaminate on substrate acting as a parting agent,
 - .3 Inadequate application of primer or adhesive.
 - .2 Misalignment: Alignment of row to starting line is lost due to swerving during application or to roll not being unrolled, aligned, and rerolled straight prior to application.
 - .1 Misaligned roll to be cut at point where swerve begins and restarted.
 - .2 Ensure membrane rolls are allowed to relax. Use heat in a zig-zag pattern to relax thermo-fusible films and membrane reinforcement.
 - .3 Ensure pressure is applied evenly across roll during application to avoid drifting.
 - .3 Wrinkles: Undulations located on surface of membrane after it has been applied:
 - .1 Cross-Sheet Undulations: Waves in membrane due to installation in a stop and go fashion.
 - .2 Continuous Ridging of Membrane: Formed by movement of substrate underneath membrane. Ensure substrate is secure before continuing.
 - .4 Blisters: Pocket of air trapped under membrane where full adhesion was not achieved or trapped moisture released from substrate:
 - .1 Remove and repair significant blisters.
 - .2 Cut blister and adhere any loose membrane.
 - .3 Apply patch membrane over repair area, extend a min. 152mm (6") on all sides.
 - .5 Membrane Patches: Cap sheet membrane patches to be installed from seam to seam. Minimum size of membrane patch to be 915 x 915 mm (36" x36").

- .7 Primer Installation:
 - .1 Apply primer to clean and dry surfaces with a paint brush, roller or sprayer at temperatures 0°C (31°F) and above.
 - .2 Apply primer at a coverage rate between of 0.1 to 0.5 L/m² (0.25 to 1.22 gallon/100 ft²) as recommended by membrane manufacturer for surface type.
 - .3 Ensure all substrates are fully covered with primer with no areas bare and avoid pooling.
 - .4 Allow primer to dry and flash-off prior to installation of new membrane and flashings.
- .8 Base Sheet Field Membrane: Factory Laminated to Cover Board (Soprema Option):
 - .1 Self-adhere first part of dual edge membrane side laps and heat weld with hot air gun or torch remaining part of side laps to satisfaction of Observer.
 - .2 Use a membrane manufacturer recommended weighted roller to press membrane down onto substrate over side laps.
 - .3 Install 330mm (13") wide modified bitumen base sheet cover strips along and centered over all panel end joints.
 - .4 Heat weld side laps and end laps of base sheet field membrane to achieve continuous bond and seal between overlapping sheets.
- .9 Base Sheet Field Membrane, Self-adhered Installation: (JM & Siplast Option)
 - .1 Prime substrate and around perimeters to receive new self-adhered base sheet membrane and flashings.
 - .1 Install specified primer at application rate and temperature recommended by manufacturer to avoid pooling and heavy areas.
 - .2 Allow primer to dry a minimum of 30 minutes or until staining does not occur upon touch and surface becomes tacky.
 - .2 Field measure and cut membrane to length of run required and roll up for installation.
 - .3 Starting at low point of roof, perpendicular to slope, unroll base sheet membrane and position.
 - .4 Once aligned in desired position, peel back a portion of release under film and press membrane onto substrate for initial adherence.
 - .5 Hold membrane tight and peel back release under film by pulling diagonally to remove fully and discard. Broom sheet into place to ensure full contact with substrate
 - .6 Overlap each preceding flashing sheet by min. 76mm (3") on side laps and align bottom edge to a chalk reference line along base sheet membrane. Lap membrane flashing onto field membrane a minimum 102mm (4").
 - .7 Use a membrane manufacturer recommended weighted roller to press membrane down onto substrate including laps. Finish by aligning edge of roller with lower end of side laps and rolling up membrane.
 - .1 Do not cut membrane to remove trapped air bubbles. Squeeze out air bubbles by pushing roller to edge of laps.

- .8 Heat weld side laps and end laps of base sheet field membrane to achieve continuous bond and seal between overlapping sheets.
- .10 Base Sheet Flashing, Self-adhered Installation:
 - .1 Where required, prime concrete and wood surfaces at roof projections and around perimeter to receive new base sheet membrane flashings.
 - .2 Install membrane flashing onto substrate in strips one membrane roll wide (40" or 1m) and extend over perimeters as shown on detail drawings
 - .3 Field measure and cut flashing membrane to length required for flashing at each detail and roll up for installation.
 - .4 Install base sheet flashing starting at outside face of perimeter, running across perimeter detail, and down onto flat of roof.
 - .5 Once aligned in position, peel back a portion of release sheet and press membrane onto substrate for initial adherence. Hold membrane flashing tight and peel back release sheet by pulling diagonally.
 - .6 Overlap each preceding flashing sheet by min. 76mm (3") on side laps and align bottom edge to a chalk reference line along base sheet membrane. Lap membrane flashing onto field membrane a minimum 102mm (4").
 - .7 Use a membrane manufacturer recommended weighted roller to press membrane down onto substrate including laps. Finish by aligning edge of roller with lower end of side laps and rolling up membrane.
 - .1 Do not cut membrane to remove trapped air bubbles. Squeeze out air bubbles by pushing roller to edge of laps.
 - .8 Provide preliminary securement of membrane on outside edge or perimeters before installation of finish metal flashings and trim. Fasten top edge of membrane flashings on outside face of perimeter details with round top nails spaced every 229mm (9") o/c.
 - .9 Heat weld side laps and end laps of base sheet flashing to achieve continuous bond and seal between overlapping sheets.
- .11 Gusset Reinforcement:
 - .1 Install membrane gussets at inside and outside corner locations around perimeters, roof curbs, and sleepers to reinforce base sheet membrane layer.
 - .1 Gusset size to be approx. 76x152mm (3"x6") with bottom cut to form "V" shape. Where installing over cant strip, provide additional "V" shape at top of gusset.
 - .2 OBSERVER TO REVIEW MEMBRANE GUSSET INSTALLATION WORK BEFORE COMMENCEMENT OF CAP SHEET MEMBRANE INSTALLATION.
- .12 Cap Sheet Field Membrane, Torch Installation:
 - .1 Complete installation of base sheet flashing prior to installing membrane cap sheet and cap sheet flashings.
 - .2 Field measure and cut membrane to length of run required and roll up for installation.
 - .3 Starting at low point on roof, perpendicular to slope, unroll cap sheet, align and re-roll from both ends.

- .4 Unroll and install cap sheet carefully in straight and parallel rows keeping majority of flame on membrane roll.
 - .5 Cap sheet to be torched across flat of roof, overtop of base sheet, and terminated at perimeters and vertical surfaces ensuring a good bond.
 - .6 Lap sheets 76mm (3") for side laps and a minimum 152mm (6") for end laps. Offset joints in cap sheet 305mm (12") minimum from those of base sheet.
 - .7 Heat weld side laps and end laps of cap sheet field membrane to achieve continuous bond and seal between overlapping sheets.
- .13 Cap Sheet Flashing, Torch Installation:
- .1 Cap sheet membrane flashing to be torched up and over perimeter details.
 - .2 Install membrane flashing onto substrate in strips one membrane roll wide (40" or 1m) and extend up perimeters as shown on detail drawings
 - .3 Field measure and cut flashing membrane to length required for flashing at each detail and roll up for installation.
 - .4 Set cap sheet to offset base sheet flashing joints by 50% and extend a minimum of 152mm (6") onto roof. All side lap joints to be a minimum 76mm (3").
 - .5 Align bottom edge to a chalk reference line along cap sheet membrane.
 - .6 Install cap sheet flashing onto field membrane a minimum 102mm (4") at base of perimeter detail. Run flashing up vertical and across perimeter detail to outside edge.
 - .7 Overlap each preceding cap sheet flashing sheet by min. 76mm (3") on side laps. Offset joints in cap sheet flashing 305mm (12") minimum from those of base sheet flashing.
 - .8 Properly secure flashings to their support, without sags, blisters, fish-mouths or wrinkles with terminations as indicated on drawings and details.
 - .9 Heat weld side laps and end laps of cap sheet flashing to achieve continuous bond and seal between overlapping sheets.

3.13 LIQUID APPLIED PMMA RESIN FLASHINGS

- .1 Where specifically indicated in detail drawings and at any junctions where conventional installation of membrane flashings are not feasible, install new liquid applied resin flashing system.
 - .2 Resin system to be a layered application consisting of two coats of thixotropic catalyzed polymethylmethacrylate (PMMA) resin encapsulating a layer of polyester fleece reinforcement.
 - .3 Installation of liquid applied flashing system to follow in STRICT ACCORDANCE with manufacturer's written instructions.
 - .4 Ensure substrates are free from gross irregularities, loose, unsound or foreign material such as dirt, ice, snow, water, grease, oil, bituminous products, release agents, laitance, paint, loose particles/friable matter, rust or any other material that would be detrimental to adhesion of catalyzed primer and/or resin to substrate.
- .1 Some surfaces may require scarification, shot-blasting, or grinding to achieve a suitable substrate. Wipe surfaces with a clean cloth saturated with specified cleaner/solvent to

- remove grease, oils or dust that may affect adhesion and to cured PMMA surfaces to receive a subsequent coat of resin.
- .2 Concrete substrates to receive an application of specified PMMA roofing system to have a maximum moisture content of 6% and a maximum internal relative humidity of 75%.
- .5 Preparation of Concrete Block and/or Masonry Substrates:
- .1 Existing concrete substrates to have a minimum hardness of 24 N/mm² (3,500 psi).
- .2 Scarify or shot-blast concrete or masonry surfaces to provide a sound substrate free from laitance and residue from bitumen, coal tar, primer, coatings, adhesives, sealer or any material that may inhibit adhesion.
- .3 Prepare concrete surface to generate a concrete surface profile of CSP-2 to CSP-4 as defined by ICRI.
- .4 Repair spalls and voids on vertical or horizontal surfaces using specified primer and preparation paste.
- .6 Preparation of Poured or Precast Concrete Substrates:
- .1 Repair and Leveling: Before application of roofing membrane, and after priming, fill all joints, cracks, voids, fractures, depressions, small indentations, and low areas in substrate using specified paste or repair mortar.
- .2 Prime cracks and joints with specified PMMA primer and fill cracks and joints using specified preparation paste prior to flashing application. Commence flashing application immediately following catalyzation of preparation paste.
- .3 Prime areas of concrete substrate intended for repair using specified PMMA primer. Fill areas using specified paste or repair mortar and allow to catalyze. Follow paste or repair mortar manufacturer's published minimum and maximum product thickness limitations per lift.
- .7 Preparation of Steel and/or Aluminum Substrates:
- .1 Grind to generate a "white-metal" surface and remove loose particles. Extend preparation area a minimum of 13mm (½") beyond termination of roofing/flashing system. Do not use cleaner/solvent after grinding. Notch steel surfaces to provide a rust-stop where detailed.
- .8 Preparation of Wood and/or Plywood Flashing Substrates:
- .1 Tape joints between plywood or wood panels using specified tape and prime wood/plywood surfaces to receive specified flashing system with specified PMMA-based primer and allow primer to set prior to application of flashing system.
- .9 Preparation of Plastic (PVC, ABS) Substrates:
- .1 Tape joint around bottom of pipe penetrations using specified tape. Lightly sand and prime wood/plywood surfaces to receive specified flashing system with specified PMMA-based primer and allow primer to set prior to application of flashing system.
- .2 Fill joints, voids, and cracks around base of pipe penetrations using specified preparation paste or repair mortar prior to flashing application. Use tape joints around base for larger gaps.

- .3 Follow paste or repair mortar manufacturer's published minimum and maximum product thickness limitations per lift. Commence flashing application immediately following catalyzation of preparation paste.
- .10 Preparation/Mixing/Catalyzing Resin Products:
 - .1 Pour desired quantity of resin into a clean container and using a spiral mixer or mixing paddle, stir liquid for time period specified by resin manufacturer.
 - .2 Calculate amount of catalyst powder needed using manufacturer's guidelines and add pre-measured catalyst to resin component.
 - .3 Mix again for time period specified by resin manufacturer, ensuring that product is free from swirls and bubbles.
 - .4 Ensure that air is not entrained into product during mixing process. To avoid aeration, do not use a spiral mixer unless spiral section of mixer can be fully contained in liquid during mixing process.
 - .5 Mix only enough product to ensure it can be applied before expiration of resin pot life.
- .11 Primer Application:
 - .1 Apply primer resin using a roller or brush at minimum rate specified by primer manufacturer over poured reinforced concrete substrates.
 - .2 Apply primer resin using a roller or brush at increased rate specified by primer manufacturer over DensDeck, DensDeck Prime, and granule surfaced membrane substrates.
 - .3 Increase application rates over other absorbent substrates. Do not let resin pool or pond. Do not under-apply or over-apply primers as this may interfere with proper primer catalyzation.
 - .4 Make allowances for saturation of roller covers and application equipment.
- .12 Paste Application:
 - .1 Allow primer to set and apply catalyzed preparation paste using a trowel.
 - .2 Before application of resin over catalyzed paste surface, specified cleaner/solvent, wipe surface of paste using specified cleaner/solvent and allow to dry.
 - .3 Treat surface again if not followed up by resin application within 60 minutes.
- .13 Flashing Membrane Application:
 - .1 Using masking tape, mask perimeter of area to receive flashing system.
 - .2 Apply resin primer to substrates requiring additional preparation and allow primer to set.
 - .3 Pre-cut fleece to ensure a proper fit at transitions and corners prior to membrane application.
 - .4 Apply an even, generous base coat of flashing resin using a roller at minimum rate specified by resin manufacturer to prepared surfaces requiring flashing coverage.
 - .5 Work fleece into wet, catalyzed resin using a brush or roller to fully embed fleece in resin and remove trapped air.

- .6 Lap fleece layers a minimum of 51mm (2") and apply an additional coat of catalyzed resin between layers of overlapping fleece.
- .7 Again using a roller, apply an even top coat of catalyzed resin at minimum rate specified by resin manufacturer immediately following embedment of fleece, ensuring full saturation of fleece.
- .8 Ensure that flashing resin is applied to extend a 6mm (0.25") beyond fleece. Remove tape before catalyzed resin sets. Make allowances for saturation of roller covers and application equipment.
- .9 Should work be interrupted for more than 12 hours or surface of catalyzed resin becomes dirty or contaminated by elements, wipe surface to be lapped with new flashing resin using specified cleaner/solvent.
- .10 Allow surface to dry for a minimum 20 minutes and a maximum 60 minutes before continuing work.
- .14 Skid Resistant Surfacing:
 - .1 Over horizontal area of new resin flashing, apply an additional top coat of catalyzed roof resin at minimum rate specified by manufacturer; and broadcast granules into resin at a rate recommended by manufacturer before resin sets.
 - .2 Apply a clear coat of resin over granular surface if required by system manufacturer.

3.14 ROOF PENETRATIONS & ACCESSORIES

- .1 On Roof Areas 1.1 and 2.1: Install vent stack flashings, support flashings, and other roof penetration flashings, and seal with roof membrane in accordance with Manufacturer's instructions and as indicated on detail drawings.
 - .1 Prime all metal flanges with modified bitumen compatible primer, and allow any solvents to flash-off and dry completely prior to installation.
 - .2 Set metal flange in bed of manufacturer recommended and system compatible roofing cement applied over base sheet membrane, ensuring a positive bond.
 - .3 Install an additional ply of base sheet membrane flashing over metal flange prior to installing cap sheet membrane. Additional ply of base membrane to extend a minimum of 152mm (6") past all edges of metal flange.
 - .4 Install cap sheet ply over base flashing ensuring a full bond to base ply membrane.
 - .5 Apply continuous bead of manufacturer's recommended and system compatible sealant around penetration at point where membrane terminates.
- .2 Sacrificial Protection Membrane: Protect surface of finished roof membrane from damage underneath all rooftop supports and equipment laid on top of roof membrane.
 - .1 Provide self adhered or cold applied sacrificial squares of matching cap sheet membrane under each base or footing of rooftop support and equipment.
 - .2 Custom cut cap sheet squares to suit width and length of each occurrence and include additional minimum 51mm (2.0") extension of membrane on all sides.

3.15 ROOF DRAINS

- .1 General Practice:

- .1 Ensure existing roof drains, rain gutters, and down pipes are clear of debris and are free flowing prior to installation of new roof system.
 - .1 Any blockages are to be reported prior to start of Work. Once Work has begun, Contractor assumes responsibility for free flowing drains and clearing blockages at no additional cost to Owner.
 - .2 Where required for new roof drains and interior plumbing, Contractor to provide interior plumbing and hook-up to existing storm water drainage system and co-ordinate installation of same with Owner.
- .2 Prior to installation of new roof, ensure that all drains are located at a height where new roof system is able to clear majority of roof top water caused by rainfall within a seventy-two (72) hour period.
- .3 Once work has begun, no roof area to be left overnight without adequate provision for drainage.
- .4 Install drains in accordance with detail drawings and as per manufacturer's written instructions and guidelines.
- .2 Roof Drain Installation:
 - .1 On Roof Areas 1.1 and 2.1: At all existing roof drain locations, install new spun copper retrofit drain inserts into existing drain piping with attached new U-Flow connectors. Drain body insert to be secured to substrate with min. four (4) fasteners per drain as required to properly secure drain body.
 - .1 At all existing roof drains employing control flow weir devices, it is mandatory to reinstate existing devices or provide new control flow devices with equivalent flow rates inside new roof drains.
 - .2 Affix U-Flow connector seal to bottom of drain stem before insert retrofit drain body down into existing storm drainage pipe.
 - .2 Set metal flange of drain body into continuous bed of manufacturer recommended and system compatible roofing cement applied over base sheet membrane.
 - .3 Mechanically secure drain body to deck and substrate with min. four (4) fasteners per drain through drain flange or by underdeck clamping ring.
 - .4 Install target patch of membrane reinforcement over metal drain flange. Use a square of 1m x 1m (39" x 39") base sheet membrane and install over drain at a 45° angle to direction of base sheet rolls.
 - .5 Install cap sheet over base sheet membrane with drain in center of roll and without seams in drain area.
 - .1 All end laps of cap sheet to be min. 915mm (36") away from drain.
 - .2 Where seams of cap sheet do not align properly with drain location, install cap sheet over drain area first and picture-frame cap sheet into remainder of roof.
 - .3 At drain sump areas larger than 1.2m x 1.2m (4' x 4'), install cap sheet over sump area first without any endlaps and picture-frame into remainder of roof.
 - .6 Place Clamping Ring over raised bolt studs. Install stainless steel self locking nuts to tighten Clamping Ring against membrane flashings until secure.

- .7 Install ballast guard strainer dome and secure with cotterless pin or wing nut screw.
- .3 Overflow Scupper Drain Installation:
 - .1 On Roof Areas 1.1 and 2.1: Install new metal scupper overflow drains at a perimeter locations determined and coordinated on site with Observer.
 - .2 Install open top overflow scupper drains to suit height of finished perimeter detail:
 - .1 New open-top overflow scuppers to be min. 152x152mm (6"x6") fabricated from 20 oz. copper to suit and complete with gravel stop edge on three sides of flange, set at inside face of parapet.
 - .3 Height of Overflow Scupper Drains:
 - .1 On roof areas without sloped roof deck or tapered insulation, install overflow scupper drains 25mm (1") above finished roof membrane as directed on site by Consultant for each roof area.
 - .2 On roof areas with sloped roof deck or tapered insulation, install overflow scupper drains at level of finished roof membrane, unless directed otherwise on site by Consultant.
 - .4 Solder all joints to make continuous water tight seal. Outer face of scupper penetrating through or beyond parapet/perimeter to be encapsulated with prefinished metal cover.
 - .5 Where draining on to lower roof areas, provide suitable concrete paver on 25mm (1") extruded polystyrene insulation as per Rimkus detail at bottom of downpipe as a splash pad.

3.16 MISCELLANEOUS MECHANICAL & ELECTRICAL

- .1 Unless stated in writing elsewhere, Contractor responsible for all Mechanical and Electrical Work required to perform complete installation of new roofing. Any and all costs associated with HVAC disconnection, removal, and reconnection, including modification of gas and conduit lines, to be included in Bid Pricing, unless specified otherwise on Bid Form.
 - .1 Coordinate any planned disruptions in advance with Owner to minimize inconvenience.
- .2 HVAC and Rooftop Equipment: Disconnect, lift (if necessary), modify, and reconnect all Heating, Ventilation, Air Conditioning, and Mechanical units as required to for new roof system.
 - .1 Modify existing sleepers, curbs, and supports as required to suit new roof system installation and configuration as detailed. Ensure modified sleepers, curbs, and supports are made watertight with new membrane and flashings as required.
 - .2 Remove and dispose of identified and designated abandoned, redundant, and unused HVAC equipment from roof and worksite.
- .3 Gas Lines and Conduits: Disconnect, modify, and reconnect all gas lines, electrical lines, and conduits as required to suit new roof installation height and configuration of projection detailing.
 - .1 All gas line work must be performed by a qualified Gas Fitter and must conform to requirements of CSA B149.1-10.
 - .2 Re-install gas lines and conduits at a height of 150mm (6") to 200mm (8") above finished roof surface. Secure all loose cabling and conduits off surface of roof membrane.

- .3 Ensure that all gas line penetrations are separated from all electrical line penetrations with their own roof flashing supports. Provide any new sleeves, goosenecks, or curbs required using Rimkus approved flashing supports and installation methods.
- .4 At threaded gas line piping, which cannot be permanently enclosed or covered, construct new insulated and waterproof dog house detail with removable lid for periodic thread inspection.
- .5 Paint all gas lines on areas of roof work with exterior grade, yellow paint for metal surfaces; Rust Paint by Tremclad or Rimkus approved equivalent.
- .4 Underdeck Securement: Where existing sections of roof decking are to be removed, ensure any cabling, conduits, and attachments (plumbing, electrical wiring, lighting fixtures, etc.) secured to underside are disconnected, removed, and relocated. Notify Owner's Representative, if necessary, to have interior services disconnected, removed, and relocated by Owner.
- .5 Temporary Security: Provide overnight security, at no additional cost to Owner, where removal of any venting or HVAC equipment results with an opening in roof deck that cannot be permanently sealed on same day. Security company must be preapproved by both Owner and Consultant in advance.

3.17 TEMPORARY WATER CUT-OFFS

- .1 All membrane flashings to be installed concurrently with roof membrane in order to keep roof system watertight during performance of work.
- .2 Temporary waterproof seals to be placed on daily work as required. All temporary water-stops to be constructed to provide a one hundred (100) percent watertight seal.
- .3 New roofing membrane to be carried into water-stop. Water-stop to be sealed to roof deck and/or substrate to prevent water travel and infiltration under new or existing roofing.
- .4 Edge of roof membrane to be sealed in a continuous heavy application of sealant. Temporary seals to be removed and cleaned up before proceeding with remaining work.
- .5 When work resumes, cut out and dispose of all contaminated membrane. All sealant, contaminated membrane, insulation fillers, etc. to be removed from work area and properly disposed of offsite. Reuse of these materials in new work is strictly prohibited.
- .6 If inclement weather occurs while a temporary water-stop is in place, Contractor to provide all necessary labour required to monitor situation and maintain watertight condition.
- .7 If any water is allowed to penetrate under newly completed roofing, then affected area to be cut out, removed, and replaced with new materials at Contractor's own expense.

3.18 METAL FLASHINGS

- .1 On Roof Areas 1.1 and 2.1: After installation of roof membrane and membrane flashings, new perimeter metal and metal flashings to be installed as detailed in Section 07 62 00 and as indicated on drawings.

3.19 SEALANTS

- .1 On Roof Areas 1.1 and 2.1: After installation of roof membrane and membrane flashings, install sealants as per Section 07 92 00 – Sealants and as recommended by membrane manufacturer.

3.20 CLEAN-UP

- .1 On Roof Areas 1.1 and 2.1: Clean up and remove from job site on a daily basis, all rubbish and surplus materials resulting from this work.
- .2 Drag a magnetic bar across work area and grounds to ensure removal of all discarded fasteners and sharp metal debris.

END OF SECTION - 07 52 16

PART 1 - GENERAL

1.1 GENERAL REQUIREMENTS

- .1 Use only new materials in perfect condition, free from any defects which may impair strength, durability, or appearance of finished wall cladding coating.
- .2 Perform all work of this section to highest standards of workmanship in industry. Use only fully trained applicators in strict accordance with guidelines of manufacturer and CRCA.
- .3 Finished work to achieve a completely water-tight wall assembly.

1.2 RELATED SECTIONS

- .1 Section 02 41 19 – Selective Demolition & Removal
- .2 Section 07 62 00 – Sheet Metal Flashing & Trim
- .3 Section 07 92 00 – Joint Sealants

1.3 REFERENCE STANDARDS

- .1 Latest edition of all listed references; most stringent requirements to govern in conflicts:
 - .1 American Society for Testing and Materials (ASTM) International:
 - .1 ASTM G-29: Test Methods for Algae Resistance,
 - .2 ASTM E-108: Test Method for Fire Test of Wall Coverings,
 - .3 ASTM D-1653: Water Vapour Transmission of Materials.
 - .2 Factory Mutual Global (FM):
 - .1 FM 4470: Approval Standards for Single Ply, Polymer Modified Bitumen Sheet, Built-Up Roof, and Liquid Applied Wall Assemblies for use in Class 1 and Non-combustible Roof Deck and Wall Construction.
 - .3 Underwriters Laboratories of Canada (CAN/ULC):
 - .1 S107: Fire Tests of Wall Coverings (Class A)
 - .4 Master Painters Institute (MPI): Specifications Manual.
 - .5 National Association of Corrosion Engineers (NACE): Industrial Maintenance Painting.
 - .6 Society for Protective Coatings (SSPC): Steel Structures Painting Manual.
 - .7 Ontario Industrial Roofing Contractors Association (OIRCA): Roofing Manual.
 - .8 Canadian Roofing Contractors Association (CRCA): Roofing and Waterproofing Manual.

1.4 SYSTEM REQUIREMENTS

- .1 Preparation of Substrate to receive new wall coating and related materials.
- .2 Application of seam sealer and self adhering flashing tape to prepared substrate.
- .3 Application of two (2) layer wallcoating system.

1.5 SUBMITTALS

- .1 Provide with Bid Submission:
 - .1 Sample copy of Manufacturer's Labour, Material, and Workmanship Warranty,
 - .2 Sample copy of Contractor's Warranty.
- .2 Provide to Rooftop Quality Observer, at Prestart Meeting:
 - .1 Finalized project work schedule listing start date, anticipated number of working days working, and manpower assignments for project.
 - .2 Current WSIB Clearance Letter for Place of Work.
 - .3 Specified Bonds and Insurance in Owner's name.
 - .4 Letter and completed Manufacturer's project warranty application form sent to "Warranty Provider" advising them of project start and particulars.
 - .5 Complete Materials List; including current installation instructions and product datasheets providing characteristics of all proposed materials to be installed. Maintain a copy of instructions onsite with foreman at all times.
 - .6 Safety Data Sheets (SDS) pertaining to all proposed materials to be used on site to perform Work.
 - .7 Letter by Contractor certifying that all specified wall cladding system components are compatible, are approved by Manufacturer, meet specified warranty terms, and are compatible with existing substrates.
 - .8 List of "Trained and Carded Membrane Approved Applicators" to work and be present during performance of Work.
 - .9 Health & Safety Plan for Specific Work Site including contact list and phone numbers for project, and twenty-four (24) hour emergency contact numbers.
- .3 Submit documents in accordance with Section 01 33 00.

1.6 QUALITY ASSURANCE

- .1 Make no deviation from Project Specifications or approved shop drawings without prior written approval by Consultant and, if applicable, Coating Manufacturer.
- .2 Work to be performed by a qualified contractor. Provide proof of certification in writing from waterproofing manufacturer for installation of primary waterproofing products.
- .3 Contractor to attend all necessary job meetings and to provide competent full-time supervisors, experienced roofing applicators, all required materials, tools, plant, and equipment necessary for proper and successful installation.
- .4 Primary wall cladding coating and related materials to be manufactured by a supplier employing a quality management system monitored regularly by a third party auditor
- .5 Wall cladding Coating Manufacturer to provide all required trained company personnel to attend necessary job meetings, perform periodic reviews with written reports, conduct a final review upon successful completion of project, and issue warranties.

1.7 QUALITY OBSERVATION

- .1 Rimkus Consulting Group Canada Inc., hereafter known as “Observer”, is an independent Rooftop Quality Observation Agency appointed by Owner to observe performance of wall Work:
 - .1 Arrange Prestart site meeting with Observer no more than three (3) weeks prior to commencement of Work on site. Obtain Observer's instructions and reference procedures to be followed on project.
 - .2 Provide to Observer date when each phase of work will begin, at least forty-eight (48) hours prior to commencement of Work for phase.
 - .3 Arrange Final Observation and examination of installed coating with both Observer and Manufacturer's Technical Representative.
- .2 Cooperate with Observer and afford all facilities necessary to permit full Rooftop Quality Observations during performance of Work. Act immediately on instructions given by Observer.
- .3 When required, provide wall cut-outs and samples in field where directed by Observer and make good without additional cost to Owner.
- .4 When initial tests and observations reveal work failing to meet contract requirements, pay for any additional testing and observations required by Observer or third party testing agency for correction of Work, without additional cost to Owner.
- .5 Copies of Rooftop Quality Observation Reports to be issued by Observer to Owner and Prime Contractor.

1.8 PRODUCT DELIVERY STORAGE AND HANDLING

- .1 Deliver materials in manufacturer's original sealed and labelled containers and in quantities required to allow continuity of application of product.
- .2 Store closed containers in a cool, dry area away from heat, direct sunlight, oxidizing agents, strong acids, and strong alkalis.
- .3 Store materials in a well ventilated area at temperature range between 0°C and below 29°C.
- .4 Take precautions against vapours as they may form explosive mixtures with air:
 - .1 Avoid skin and eye contact with harmful materials.
 - .2 Avoid breathing fumes when above Threshold Limit Value (TLV).
 - .3 Do not eat, drink, or smoke in or around application areas.
- .5 Only materials to be installed on same day to be removed from protected location to work site.
- .6 Properly handle all materials to prevent possible damage and contamination from sources of moisture or other foreign matter.
- .7 Keep materials away from open fire, flame, spark, or any other possible source of ignition.
- .8 Any materials found to be damaged or improperly stored in any manner other than those stated above to be automatically rejected, removed, and replaced at Contractor's own expense to satisfaction of Consultant.

1.9 ENVIRONMENTAL REQUIREMENTS

- .1 Do not apply materials to damp, wet, or frozen deck or substrates.

- .2 Arrange work sequence to avoid use of newly constructed roofing as a walking surface or for equipment movement and storage.
- .3 Prior to and during application, all dirt, debris and dust to be removed from surfaces by vacuuming, sweeping, blowing with compressed air, and/or similar methods.
- .4 All waste material (i.e., scrap roof membrane, empty cans of adhesive) to be immediately removed from site by Contractor and properly transported to a legal dumping area authorized to receive such material.
- .5 Immediately stop work if any unusual or concealed condition is discovered and immediately notify Consultant of such condition in writing in order to obtain additional instruction.
- .6 Site cleanup, including both interior and exterior building areas that have been affected by construction, to be completed to satisfaction of Consultant.
- .7 All landscaped areas damaged by construction activities to be repaired at no cost to Owner.
- .8 Protective wear to be worn when using solvents or adhesives or as required by job conditions.

1.10 PREPARATORY WORK & SITE CONDITIONS

- .1 Verify that all roof drains, scupper drains, and eave troughs are unclogged and functioning correctly before starting work. Report any blockages in writing to Consultant for corrective action prior to installation work.
- .2 Sweep roof deck, wall surface and/or substrates free of dust or dirt and remove all debris prior to any installation work.
- .3 Do not apply materials during inclement weather or when such a weather event is probable during application work.
- .4 Take adequate precautions to ensure that all materials, any recently applied coatings, and existing building interiors are protected from possible moisture damage or contamination.
- .5 Follow temperature restrictions as set out by manufacturer in printed installation instructions.

1.11 SAFETY AND PROTECTION

- .1 Latest edition of all listed references to apply:
 - .1 CAN/CSA S269.2M: Access Scaffolding for Construction Purposes.
 - .2 Fire Commissioner of Canada: FC 301 - Standard for Construction Operations.
- .2 Solvents, Adhesives and Membranes:
 - .1 Store only enough solvents and adhesives on roof for same day's use. Do not leave adhesives on roof over night. Manufacturer supplied adhesives should be stored in their overnight containers.
 - .2 Do not install self adhering roof membrane when temperature remains below 5°C. Apply materials in accordance with recommendations of manufacturer and Canadian Modified Bitumen Manufacturer's Association.
 - .3 Protect walls where hoisting is required.
 - .4 Protect roofs from damage due to traffic and materials handling until completion.

- .5 Keep a fire extinguisher at access to building interior wherever solvent based products are stored or used.
- .3 Fire Safety:
 - .1 Contractor must keep charged and ready fire extinguishers on site at all times, including on roof and at access points to building interior.
- .4 Health and Safety:
 - .1 Contractor to comply with all safety requirements as per current printed edition of Provincial Occupational Health and Safety Act and with Ontario Industrial Roofing Contractors Association (OIRCA) standards.

1.12 WARRANTY

- .1 Upon Total Completion of project, including completion of all post installation procedures, provide Owner with Manufacturer's Labour, Material, and Workmanship Warranty for a minimum period of ten (10) years.
 - .1 Issue at no additional cost to Owner, a Warranty for specified term period without deductibles or limitations on coverage amount.
 - .2 Warranty not to exclude random areas of ponding from coverage.

PART 2 - PRODUCTS

2.1 MATERIALS

- .1 Surface Cleaner: Degreaser or soap solution as recommended by coating manufacturer.
- .2 Primer: Manufacturer's water based, acrylic metal primer for treating rusted areas on metal.
 - .1 SolarGard Metal Primer by Republic Powdered Metals Inc.,
 - .2 #600 Rust Remover and Conditioner (RRC) by Truco Inc.,
 - .3 Rimkus approved equivalent primer.
- .3 Seam Sealers and Tapes:
 - .1 Seam Sealer: Single component, urethane industrial maintenance coating for waterproofing metal building seams and sealing over fastener heads.
 - .1 SolarGard Seam Sealer by Republic Powdered Metals Inc.,
 - .2 #7174 trowel grade or #7141 Super Seam Sealer by Truco Inc.,
 - .3 Rimkus approved equivalent seam sealer.
 - .2 Flashing Tape: Butyl backed, polyester reinforced, tape for seams, fasteners, and flashing reinforcement. Provide in minimum 3" (76mm) to 6" (152mm) widths.
 - .1 WebSeal by EternaBond,
 - .2 Rimkus approved equivalent reinforcing tape.
- .4 Reinforcing fabric: 100% stitch-bonded polyester fabric flashing reinforcement and repair:
 - .1 PermaFab by Republic Powdered Metals Inc.,
 - .2 RH-53 polyester membrane by Truco Inc.,
 - .3 Rimkus approved equivalent reinforcing tape.

- .5 Elastomeric Base Coat: Water-based, acrylic, elastomeric coating for metal roofing substrates:
 - .1 SolarGard Metal Primer or SolarGard Hy-Build by Republic Powdered Metals Inc.,
 - .2 #7145 Grey Eterna-Seal Regular rubber coating by Truco Inc.,
 - .3 SmartRoof System by Polymer Science Corporation,
 - .4 PremiumCoat System by HydroStop,
 - .5 502 RC-W Elasto-Kote by Karnak,
 - .6 2PK-PUR by Kemper,
 - .7 Roof Mate by United Coatings.
- .6 Elastomeric Finish Coat: Water-based, acrylic, elastomeric coating for metal roofing substrates. Colour to be chosen by Owner from samples provided of manufacturer's standard colour catalogue. Finish coat application to have a minimum total radiative Solar Reflectance Index (SRI) between 50 and 75:
 - .1 SOLARGARD HY-BUILD by Republic Powdered Metals Inc.,
 - .2 #7140 Eterna-Seal Just Super rubber coating by Truco Inc.,
 - .3 SmartRoof System by Polymer Science Corporation,
 - .4 PremiumCoat System by HydroStop,
 - .5 502 RC-W Elasto-Kote by Karnak,
 - .6 2PK-PUR by Kemper,
 - .7 Roof Mate by United Coatings.
- .7 Coating Accessories: All tools and accessories to meet manufacturer requirements and satisfy any requirements for specified warranty.
- .8 Fasteners: Self drilling fasteners with integral EPDM and metal washers. Provide fasteners one shank diameter size larger when replacing an existing screw.
- .9 Butyl Sealant: Tremco 440 tape in 25mm (1") width. Provide liquid butyl sealant as required.
- .10 Boot Flashing: One piece EPDM rubber boot flashing with integral soft metal gasket. Provide with underlay of continuous butyl sealant and fill with mineral fiber insulation. All boot flashings to be provided with sealant and stainless steel hose clamp at top of flashing.
 - .1 Masterflash Roof Flashing by Oatey in a size to suit penetration,
 - .2 Rimkus approved equivalent reinforcing tape.

PART 3 - EXECUTION

3.1 SUBSTRATE EXAMINATION

- .1 On Designated Wall Areas: Examine all existing substrates to be coated for any gross irregularities, loose, unsound or foreign material such as dirt, ice, snow, water, grease, oil, bituminous products, release agents, laitance, paint, loose particles, friable matter, rust, or any other material that may be detrimental to adhesion of coating to substrate.
- .2 Remove metal perimeter and wall counter flashings and coping. Confirm with Consultant which flashings are an integral part of wall expansion system and can remain in place.
- .3 At existing HVAC and skylight curbs, ensure counter flashings are open at top to allow movement of wall panels without affecting connection between counter flashing and panel. Remove any screws that penetrate counter flashing, panel, and sub-girt structure.
- .4 Examine ALL existing fasteners. Replace all loose and missing screws with new fasteners at least one shank diameter size larger.

- .5 Install new foam closures at panel ends where missing or damaged.
- .6 Evaluate level of moisture in substrate to determine if existing levels are acceptable to proceed with application of specified wall coating system. Refer to manufacturer's printed recommendations.

3.2 METAL FLASHINGS

- .1 On Designated Wall Areas: Where any metal cap flashings, drip flashings, counter flashings, trim, hook strips, notched closure strips, etc. are missing, corroded, or otherwise damaged, provide new metal flashings and trim as required in accordance with Section 07 62 00.

3.3 SEALANTS

- .1 On Designated Wall Areas: Where any existing wall sealants or caulking are damaged, deteriorated, or missing, provide suitable new sealant installation in accordance with Section 07 92 00. Verify with coating manufacturer that new sealants are compatible with coating system prior to installation.

3.4 PREPARATION

- .1 On Designated Wall Areas: Clean and prepare existing metal wall panels to receive new liquid applied, elastomeric coating.
- .2 Remove all loose existing acrylic and asphalt coating and all existing sealants and mastics prior to installing seam sealer.
- .3 Remove all dirt, debris, loose rust, mill scale, flaking paint, chalk, etc. from all surfaces to receive new coating using pressure washer at 20.7 MPa (3000 psi), wire brushing, and power sanding.
 - .1 Some surfaces may require scarifying, sandblasting, or grinding to achieve a suitable substrate prior to installation.
 - .2 Brush or grind rusted areas down to bare metal or treat prepared areas with recommended rust sealer.
- .4 Clean existing gutters, gutter liners, and openings in rain water leaders to remove all dirt and provide suitable mating surface for new application of reinforcing tape and coatings.
- .5 Remove any oil, grease, or wax deposits with surface cleaner and rinse thoroughly with high pressure water blast.
- .6 Areas with Corrosion:
 - .1 Severely rusted or deteriorated sections of metal to be removed and replaced with new material to match existing profile and size.
 - .2 All lightly rusted areas to be primed with metal primer at a rate of 200 ft²/gallon or minimum thickness of 8 wet mils.
 - .3 Reapply primer to previously primed areas when primer has been applied and exposed for longer than seventy-two (72) hours before application of elastomeric coating.

3.5 SEAM SEALER, TAPING, AND FASTENERS

- .1 On Designated Wall Areas: Apply seam sealer and/or self adhering flashing tape to existing clean and prepared surfaces, seams, joints, and fasteners in accordance with manufacturer's recommendations and written application instructions.

- .2 Seam Sealer and Mesh Installation:
 - .1 Roof Penetrations: Install seam sealer at base of all roof penetrations and curbs at a rate of 35 ft/gallon with reinforcing fabric sandwiched in between sealer.
 - .2 Panel Seams: Install seam sealer at all end and side laps, and back-brush into any open seams at a rate of 35 ft/gallon with reinforcing fabric sandwiched in between sealer. Close seams openings greater than 13mm (0.5") by drawing metal together with installation of new self tapping sheet metal screws with integral neoprene washers.
 - .3 Ridge Caps: Install seam sealer at all seams on and around ridge caps and ridge ventilators at a rate of 35 ft/gallon with reinforcing fabric sandwiched in between sealer.
 - .4 Fasteners: Replace all missing, corroded, and/or stripped fasteners with new oversized fasteners. Install additional fasteners as required to draw uplifted panel sheets back together. Encapsulate all exposed fastener heads with seam sealer applied at a rate of 150 fasteners/gallon.
- .3 Flashing Tape Installation
 - .1 Apply flashing tape to clean, prepared surfaces and use neoprene roller to ensure complete adhesion.
 - .2 Roof Penetrations: At all curbs and crickets, install minimum 152mm (6") wide flashing tape centered over metal panel connection with curb flashing.
 - .3 Top Panel Seams: At top of panel termination into expansion Z-girts at walls or ridges, install minimum 101mm (4") wide flashing tape to extend up vertical portion of Z-girt closure.
 - .4 End Panel Seams: At all panel overlaps install minimum 76mm (3") wide flashing tape. Tape to extend from base of double locked portion of standing seam, down profile shape of metal wall panels, across panel width, and terminate at base of adjacent double locked standing seam.
 - .5 Panel Terminations: At side panel termination at parapets, install base flashing tape to extend up existing perimeter metal flashings. Install new Z-girt metal closures at detail as required with minimum 76mm (3") wide flashing tape to metal closure. Do not apply tape between panel and vertical wall substrates due to expansion and contraction of panels.
 - .6 Rain Gutters: At gutter drains, install 101mm (4") wide flashing tape around inside of rain water leader extending 51mm (2") into mouth of pipe and 51mm (2") upwards. Make relief cuts as required and fold out 51mm (2") onto gutter horizontal. Cover with 305mm (12") wide flashing tape centered over opening with relief cuts as required to provide 51mm (2") wide extension of tape down into rain water leader. Offset relief cuts to ensure complete coverage around rain water leader penetration.

3.6 ELASTOMERIC COATING APPLICATION

- .1 On Designated Wall Areas: Apply elastomeric coating system over prepared metal wall cladding surface and substrate employing a two (2) coat application; one (1) primer base coat and one (1) finish top coat.
- .2 Monitor weather forecast and do not apply coating where curing will not be complete before period of anticipated precipitation. Should moisture damage occur, affected areas will need to be re-coated at no additional cost to Owner.

- .3 Thoroughly mix liquid products using low RPM paddle type power mixer in accordance with manufacturer's recommendations. Use of additives or thinners is prohibited.
- .4 Apply all coating using spray, brush, or roller application methods in accordance with manufacturer's recommendations.
- .5 Plan and lay out coating work in logical segments to avoid traffic across completed installation areas.
- .6 Base Coat:
 - .1 Apply base coat to all prepared surfaces in uniform layer at wet mil thickness as per manufacturer's requirements and not less than 12 mils. Contractor is responsible to continually check wet thickness using approved coating thickness gauge.
 - .2 Coverage can be affected by porosity and texture of existing surface. Application to be executed when temperature is above 28°C (50°F).
 - .3 Where directed or required by manufacturer, apply an additional reinforcement layer of fabric into wet base coating and cover with additional base coating to a minimum 12 mils wet thickness. Ensure complete embedment and saturation of reinforcement including continuous coverage.
 - .4 Waterproof coating to be applied to all panel surfaces and extend up parapet walls and through rain gutter details. Boot flashings and penetrations to have coating system extend a minimum 152mm (6") up flashing.
 - .5 Examine base coating and repair any defect or flaw before proceeding to next step.
 - .6 Allow sufficient time, depending upon humidity and temperature, between applications to ensure proper curing.
- .7 Finish Coat:
 - .1 Once Base coating is complete on area of work and dry to touch, commence application of finish coating.
 - .2 Apply finish coat of elastomeric coating at a minimum rate of 2 gallons/100 ft² across prepared metal substrate and wall cladding. Finish coating to be applied with a minimum thickness of 12 wet mils.
 - .3 Ensure complete coverage of all areas of base coating at thickness specified by manufacturer. Contractor is responsible to continually check wet thickness using approved coating thickness gauge.
 - .4 Coverage can be affected by porosity and texture of existing surface. Application to be executed when temperature is above 28°C (50°F).
 - .5 Examine finish coating and repair any defect or flaw before final curing.
 - .6 Total thickness of applied coating system to be not less than 32 mils when wet.
- .8 Do not permit traffic on completed wall cladding surfaces unless absolutely necessary, and only after complete cure.
- .9 Ensure coating is free of standing water should a period of precipitation occur within curing period. Curing periods range from four (4) to seven (7) days depending on product used. Repair any areas required as soon as possible.

3.7 CLEAN-UP

- .1 On Designated Wall Areas: Clean up and remove from job site on a daily basis, all rubbish and surplus materials resulting from this work.

END OF SECTION - 07 56 00

PART 1 - GENERAL

1.1 SUMMARY

- .1 Section Includes: Supply and installation of new prefinished sheet metal flashings and counter flashings to complete roof system installation.
- .1 Unless specifically indicated otherwise, all references to sheet metal flashings in specifications and on drawings to refer to new prepainted steel.
- .2 Coordinate all work of this section with other sections and trades as required to ensure proper installation of specified components.

1.2 RELATED SECTIONS

- .1 Section 07 92 00 – Joint Sealants.

1.3 REFERENCES

- .1 Reference Standards: Most stringent requirement to govern conflicts between standards.
 - .1 American Society for Testing and Materials (ASTM):
 - .1 A606M-18: Specification for Steel, Sheet and Strip, High-Strength, Low-Alloy, Hot-Rolled and Cold-Rolled, with Improved Atmospheric Corrosion Resistance.
 - .2 A653M-19a: Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by Hot-Dip Process.
 - .3 A792M-10(2015): Standard Specification for Steel Sheet, 55 % Aluminum-Zinc Alloy-Coated by the Hot-Dip Process.
 - .4 A924M-19: Standard Specification for General Requirements for Steel Sheet, Metallic-Coated by the Hot-Dip Process.
 - .2 Canadian General Standards Board (CAN/CGSB):
 - .1 51.32M: Sheathing, Membrane, Breather Type.
 - .2 93.1M: Sheet, Aluminum Alloy, Prefinished.
 - .3 Canadian Standards Association (CAN/CSA):
 - .1 S136-16: Specification for Design of Cold Formed Steel Structural Members.
 - .2 S269.2-16: Access Scaffolding for Construction Purposes.
 - .4 Canadian Sheet Steel Building Institute (CSSBI):
 - .1 20M-2015: Standard for Sheet Steel Cladding for Architectural, Industrial, and Commercial Building Applications.
 - .5 Canadian Roofing Contractors Association (CRCA):
 - .1 Roofing Specifications Manual.
 - .6 Canadian Standards Association (CAN/CSA):
 - .1 B-111: Wire Nails, Spikes and Staples.
 - .7 Sheet Metal and Air Conditioning Contractors National Association (SMACNA):

- .1 Architectural Sheet Metal Manual, Seventh Edition, 2012.

1.4 SUBMITTALS

- .1 Procedures: Provide listed submittals to Section 01 33 00.
- .2 Samples: Submit min. 51mm x 51mm (2" x 2") sheet metal flashing sample for each type of material, finish, and colour specified or chosen by Owner from standard manufacturer colour range.
- .1 Samples to fully represent physical and chemical properties of materials to be supplied and installed.
- .2 Samples to be reviewed by Owner before order and delivery of materials. Return and restocking fees for incorrect or rejected materials to be at no additional cost to Owner.

1.5 CLOSEOUT SUBMITTALS

- .1 Procedures: Provide project closeout submittals to Section 01 77 00.
- .2 Warranty Documentation: Signed Contractor Warranty for Workmanship covering metal work.

1.6 QUALITY ASSURANCE

- .1 Installer Qualifications: Bondable contractor using skilled tradespeople with equipment adequate for project to perform work in an expeditious manner. Use only manufacturer approved installers to meet warranty requirements.
- .1 Contractor preapproved by Owner and Consultant.
- .2 Member of Ontario Industrial Roofing Contractors Association (OIRCA) in good standing.
- .3 Minimum 10 years of relevant experience with similar materials.
- .4 And licensed for Place of the Work.
- .2 Perform Work in accordance with Contracts Documents and manufacturer's written instructions.
- .3 Make no deviation from Specifications or approved Shop Drawings without prior written approval by Consultant and, if applicable, manufacturer.

1.7 DELIVERY, STORAGE, AND HANDLING

- .1 Deliver, store, and handle materials to manufacturer's instructions and CSSBI guidelines.
- .1 Review condition of materials at delivery. Remove and replace damaged products at own expense, including those identified by Observer.
- .2 Do not store metals in direct contact with earth, road surface, roof deck, or other metals.
- .1 Do not store materials on roof.
- .3 Store materials under cover, on elevated platforms, and protect from elements in a dry, well ventilated location.
- .1 Place suitable supports or pallets under metal stock upon delivery.
- .2 Protect metal from scratches, dents, punctures, and moisture.
- .3 Store caulking and sealants at +5°C minimum.
- .4 Handle and store products in a manner to prevent damage, oxidization, and deterioration.

- .1 Do not allow metal panels to bend or sag during handling and transport.
- .2 Bring to roof and work area only those materials to be installed on same day.

1.8 SAFETY AND PROTECTION

- .1 Scaffolding:
 - .1 Where required for access, scaffolding for construction purposes to CSA S269.2.
- .2 Safety:
 - .1 Comply with safety requirements as per current printed edition of OHSA.
 - .2 Wear protective gear during installation as required by job conditions or manufacturer.
- .3 Solvents, Adhesives, and Membranes
 - .1 Bring to roof only enough solvents, adhesives, and sealants required for same day use. Do not leave adhesives on roof over night.
 - .2 Adhesives to be stored in their overnight containers. Keep product from freezing.
- .4 Hoisting & Protection:
 - .1 Protect walls and roof perimeters from damage where hoisting is required.
 - .2 Protect roofs from damage due to traffic and material handling during project.
- .5 Fire Safety:
 - .1 Keep charged and ready fire extinguishers on site at all times, including on roof, at access points to building interior, and wherever solvent based products are stored.

1.9 WARRANTY

- .1 Contractor Warranty: Workmanship.
 - .1 Provide Contractor Warranty for Workmanship covering metal work on a certificate or form preapproved by Ontario Industrial Roofing Contractors Association (OIRCA) or specified on Contractor's Letterhead, signed, authorized, and executed for project.
 - .1 Warranty Period: Not less than 2 years from date of Substantial Completion.
 - .2 Metal work installation to be warranted free from defects related to workmanship or material deficiencies, including but not limited to water penetration, material deformation, and fading of finish.
 - .1 During warranty period provide all labour and materials required to promptly repair and rectify noted defects, in accordance with project Contract Documents, at no additional cost to Owner.
- .2 Cost of warranties to be included in Contract.

1.10 CONSTRUCTION REVIEW AND OBSERVATION

- .1 Rimkus Consulting Group Canada Inc., hereafter known as "Observer", is an independent Observation agency appointed by Owner to observe performance of Work required by this section and to review construction progress.

- .1 Arrange a Prestart meeting on-site with Observer no more than 3 weeks prior to commencement at project site. Obtain Observer's instructions and reference procedures to be followed on project.
- .2 Provide Observer with anticipated beginning date for each phase of Work, at least 48 hours prior to commencement of each phase.
- .3 Where required for warranty, arrange for Final Observation and review of installed work with both Observer and manufacturer's technical representative.
- .2 When testing or observations reveal work by Contractor failing to meet contract requirements, pay for additional testing and observation work required by Observer or third-party testing agency for correction of deficient installed work, at no additional cost to Owner.
- .3 Copies of Observation reports issued to Owner and Prime Contractor.

PART 2 - PRODUCTS

2.1 METAL FLASHINGS

- .1 Prefinished Steel Flashings: Prefinished cap flashings, counter flashings, drip flashings, jamb flashings, and closure strips to be fabricated from steel with hot-dip galvanization to ASTM A653M, Grade 230 with Z275 zinc coating.
 - .1 Base Steel: Minimum 0.61 mm (24-gauge, 0.024") nominal core thickness.
 - .2 Finish: Silicone Modified Polyester (SMP) applied over pretreated substrate:
 - .1 WeatherXL SMP topcoat by Valspar Corp.,
 - .2 Perspectra Plus Series SMP topcoat by ArcelorMittal.
 - .3 Colour: Colour to be chosen by Owner from manufacturer standard colour range.
- .2 Flashing Securement: Metal flashing hook strips, cleats, and clips to be fabricated from steel with hot-dip galvanization to ASTM A653M, Grade 230 with Z275 zinc coating. Securement flashings to be two gauges thicker than that of metal flashing being secured.
 - .1 Base Steel: Minimum 0.76 mm (22-gauge, 0.030") nominal core thickness.
 - .2 Colour and finish of securement strips to match prefinished metal flashings.
 - .3 Provide hook strips in continuous lengths, not short segments, to match metal flashings.

2.2 ACCESSORIES

- .1 Dissimilar Materials: Protect material from electrolytic action when dissimilar metals are in direct contact with one another.
 - .1 Underlay Sheet: Smooth unsaturated quality rosin sized paper weighing not less than 0.3 Kg/m² (6 lb. per 100 ft²), unless otherwise shown, to CSA A123.3M.
 - .2 Painting: Paint mating surfaces of aluminum and galvanized steel with bituminous or zinc chromate primers.
 - .3 Taping: Apply self-adhering tape or gasket with non-absorptive materials or sealants.
- .2 Bituminous Paint: Gilsonite asphalt 910-02 by Bakelite to CGSB 1-GP-108 Type II.
- .3 Joint Filler: Polyethylene, urethane, or neoprene extruded, closed cell foam to Section 07 92 00.

- .4 Sealants: Joint and finish sealants to Section 07 92 00.
- .5 Touch-up Paint: High grade enamel paint as recommended by metal manufacturer and matching colour of prefinished metal being used.

2.3 FASTENERS

- .1 General: Use galvanized, copper, aluminum, stainless steel, or coated screws most compatible with materials being installed to avoid corrosion caused by galvanic reaction.
- .2 Fasteners to Wood: Space fasteners at max. 610mm (24") on center and stagger.
 - .1 Galvanized nails, with annular thread, length to penetrate into base min. 25mm (1"),
 - .2 Min. No.8 coated steel screws to penetrate wood surface by min. 19mm (0.75").
- .3 Exposed Fasteners:
 - .1 Nylon headed No.14 Colormate fasteners by Leland Industries with hex head and self tapping or drill point tips. Length to suit installation. Colour head to match prepainted metal being secured.
 - .2 Hex head, cadmium plated metal screws with neoprene washers as manufactured by Fabco Fastening Systems, Atlas, Perma-Grip, or IRC Group approved equal. Provide with screw head caps to match colour of materials being secured.
- .4 Masonry Anchors: Rawl lead lags for screws as recommended by manufacturer.
- .5 Masonry Fasteners: Tapcon, Gripcon or Rawl spike sized to penetrate concrete 38mm (1.5") minimum unless otherwise shown.
- .6 Masonry Fasteners: Tapcon screws, Gripcon screws, or Rawl spikes with factory applied corrosion resistant coating.
 - .1 Minimum 6mm (0.25") diameter and of sufficient length to provide a minimum of 38mm (1.5") of penetration into substrate. Predrill holes into masonry to suit application.
- .7 Wedges: Rolled plumber sheet lead. Secure metal flashings on inside and should be secured with No.10 galvanized screws through neoprene washers at 760 mm (30") on center.
- .8 Pop Rivets: All stainless steel, blind pop rivets meeting ASME/ANSI B18.1.1.
 - .1 Minimum 6mm (0.25") head diameter with 3mm (0.125") shank diameter and a grip range of 4.7mm to 6.4mm (0.1875 to 0.25").
 - .2 Body and mandrel to be constructed from high-shear, 300 series stainless steel.

2.4 FABRICATION

- .1 Form bends with straight sharp lines, angles and corners into true planes, free from twists, buckles, dents and other visual distortions.
 - .1 Verify all dimensions on site affecting work of this section prior to fabrication.
- .2 Fabricate all possible work in shop in default lengths of 2.4m (8'-0") by brake forming, bench cutting, drilling, and shaping, ready for field installation
 - .1 Horizontal Flashings Wider Than 16": Cap flashings and flashings with horizontal sections having a dimension greater than 406mm (16") to be fabricated in maximum lengths of 1.2m (4'-0").

- .2 Horizontal Flashings Wider Than 20": Cap flashings and flashings with horizontal sections having a dimension greater than 508mm (20") to be fabricated with 25mm (1") high lock-folded standing seams.
- .3 Curved Perimeter Flashings: Cap flashings and flashings over curved perimeters and curbs to be fabricated in lengths of 0.61m (2'-0") or less to suit radius of arc.
- .4 Corner Flashings: Cap flashings and flashings to be fabricated with 25mm (1") high lock-folded standing seam joints at corner miters.
- .3 Fabricate sheet metal components to dimensions, profiles, shapes, and gauges shown on Shop Drawings and verified by site measurements.
 - .1 Profiled metal components to be cold rolled.
 - .2 Fabricate drip and sill flashings with minimum 2% downward slope outward to encourage drainage.
 - .3 End joints of adjacent lengths of metal flashing to be made using S-lock jointing to allow for thermal movement.
 - .4 Exposed metal flashings edges to be double-backed or hemmed min. 13mm (0.5") for appearance and stiffness. Raw edges not accepted.

PART 3 - EXECUTION

3.1 EXAMINATION & PREPARATION

- .1 Examine work of other Sections upon which work of this Section depends.
 - .1 Prior to application of flashings, review roof perimeters, parapets, curbs, and projections.
- .2 Examine installed membrane flashings for any defect of level or construction that may impact installation work before proceeding.
 - .1 Do not cut-off or remove installed membrane flashings turned down over exterior face of roof perimeters. Installed membrane to remain as part of complete roof installation.
- .3 Report discrepancies to Observer that may affect performance of roof system and deviations from specified tolerances.
 - .1 Defective or improper work must be corrected before proceeding with installation of sheet metal flashings.
- .4 Protect roof surfaces from damage and metal debris generated by work of this section.

3.2 MOCK-UP SAMPLE

- .1 Construct full size mock-up sample of typical sheet metal cap flashing installation including typical components, flashings, hook strips, cleats, and securement to substrate.
 - .1 Minimum size to be 3.66m to 4.88m (12'-0" to 16'-0") in length, at location chosen with Observer. Installation must include at least one S-lock joint.
 - .2 All materials to be supplied and installed in accordance with Contract Documents.
 - .3 Mock-up to demonstrate methods of attachment, typical components, and connections.
- .2 Reviewed and accepted Mock-up to represent minimum base standard for remaining work.

- .1 Accepted mock-up may remain in place and form part of completed Work.
- .3 Provide any additional mock-up samples as reasonably requested by Observer.

3.3 SHEET METAL INSTALLATION

- .1 Sheet metal work to be installed in a uniform manner, true to line, and free of dents, oil canning, warping, and distortions.
 - .1 Provide metal work to cover perimeters of entire roof area and make watertight under all service and weather conditions.
- .2 Install sheet metal flashings at copings, perimeters, walls, joints, curbs, roof openings, and other locations where required to protect membrane flashings, and as shown on drawings.
 - .1 Provide perimeter metal flashings with slope toward roof interior at minimum 4% slope.
 - .2 Do not form open metal joints or create pockets that fail to drain water.
 - .3 Provide concealed metal hook strips, locking strips, and clips where shown on drawings and as required to permanently hold flashing in place.
 - .1 Install concealed hook strips along all exterior perimeter faces and as detailed.
 - .2 Secure continuous hook strips, spaced at 152mm (6") on center and in staggered V-pattern. Keep lower fasteners within 32mm (1.25") of bottom of drip edge.
 - .4 Install lengths of sheet metal flashings with fasteners concealed inside S-lock joints; minimum two fasteners per joint.
 - .1 Space joints evenly where exposed to view.
 - .5 Provide inside and outside corner flashings by means of 25mm (1") high lock-folded standing seam joints at corner miters. Do not use pop rivets.
 - .1 Include intermediate securement clips in folded joint. Apply sealant before locking raised seams in place.
 - .6 On perimeter cap sheet flashings, exposed fastening not permitted on exterior face visible to public, without approval of Observer.
 - .1 Exposed fastening on interior face of perimeter cap flashing permitted.
 - .7 Space fasteners evenly and in consistent pattern. Use lead plugs and screws with rubber washers where metal flashings are installed to concrete or masonry.
- .3 Provide protection for metal work from potential galvanic action.
 - .1 Where sheet metal flashings directly contact masonry, concrete, or a different type of metal, back-paint surfaces with bituminous paint at rate of 0.12L/m² (0.25 Gal/100 ft²).
 - .2 Where sheet metal flashings directly contact uncovered wood or masonry surfaces, provide underlay separator sheet and overlap joints min. 51mm (2"). Turn up 76mm (3") at edges where horizontal surfaces intersect vertical planes.
- .4 Clean reglets in masonry walls and make free of dust and contaminants.
 - .1 Where existing reglets can not be reused, saw cut new continuous reglets 10mm (0.4") wide, 25mm (1.0") deep, or suit existing site conditions.

- .2 Secure top of metal flashings into reglet joints using lead wedges spaced at 229mm (9") on center, and set min. 6mm (0.25") out from face of masonry.
- .3 At reglets wider than 10mm (0.4") and deeper than 19mm (0.75") provide polyethylene backer rod, 25% wider than joint width, and insert into back of reglet before sealant application.

3.4 FINISH

- .1 After installation, touch-up and repair minor surface damage and scratches to finish surfaces of metal components with colour matched paint in accordance with manufacturer's instructions.
 - .1 Remove dirt, debris, and other foreign deposits from visible surfaces of metal work in accordance with metal manufacturer's cleaning instructions.
 - .2 Remove stains, caulking, and adhesives from contaminated surfaces.
 - .3 Post paint all exposed metal and metal edges exposed due to cutting or grinding.
- .2 Finished surfaces of formed metal work to be colour matched, free of damage and dents, and free of visual impairments caused by oil canning, bending, twisting, or other distortions.
 - .1 Finished product with visual appearance impaired or diminished by changes in colour between sheets, dents, distortions, or oil canned surfaces will be rejected.
 - .2 Remove and replace damaged, defaced, contorted, or otherwise defective work.

3.5 SEALANTS

- .1 Apply sealant to provide a continuous waterproof seal at all open sheet metal joints, reglets, gum joints, and where shown on drawings to Section 07 92 00.

3.6 FIELD QUALITY CONTROL

- .1 Field Observation and Testing: Cooperate with Observer and afford all necessary facilities required to permit construction review and observation during performance of Work.
 - .1 Act immediately on instructions given by Observer.
 - .2 When required or reasonably directed by Observer, make assembly cut-outs and component samples at Observer identified locations. Restore assembly and make good at no additional cost to Owner.
 - .3 Promptly share and provide Observer with a copy of written reports and instructions given to Contractor from manufacturer and warranty holder pertaining to installation and observation work on this project.
 - .1 Manufacturer may copy project related communication regarding installation work directly to Observer.

3.7 CLEANING

- .1 Remove daily surplus materials and debris resulting from work of this section and at completion.
- .2 Lightly drag a magnetic bar, without damage to surfaces, across work area and grounds to find and remove discarded fasteners and sharp metal debris.

END OF SECTION - 07 62 00

PART 1 - GENERAL

1.1 RELATED SECTIONS

- .1 Section 02 41 19 – Selective Demolition & Removal
- .2 Section 07 52 16 – SBS Modified Bituminous Membrane Roofing
- .3 Section 07 62 00 – Prefinished Sheet Metal Flashing & Trim

1.2 REFERENCES

Latest edition of all listed references to apply:

- .1 ASTM C920 – Elastomeric Joint Sealants
- .2 CAN/CGSB-19.13 – Sealing Compound, One-component, Elastomeric, Chemical Curing
- .3 Sealants: Professionals' Guide, Sealant, Waterproofing and Restoration Institute
- .4 SWRI (Sealant, Waterproofing and Restoration Institute) – Sealant and Caulking Guide Specification

1.3 QUALITY OBSERVATION

- .1 Observation of work will be carried out by designated Rooftop Quality Observer.
- .2 Prior to mobilizing on site, prepare and install sealant samples for adhesion testing, a minimum of two (2) samples for each substrate combination, according to manufacturers written guidelines. Test sealant in contact with samples of materials to be caulked to ensure that proper adhesion will be obtained and no staining of material will result. Testing to be completed prior to mobilization on site. Do not proceed with Work until samples have been approved.
- .3 Adhesion tests on new sealant will be performed at random locations at discretion of Owner's representative. Any work that is found to be sub-standard, is to be removed and replaced at no cost to Owner. Contractor is to assist with sealant adhesion tests as directed.
- .4 Execute Work of this Section by Subcontractors approved by manufacturers of materials incorporated in Work; who has equipment, adequate for Project, and skilled tradesmen to perform it expeditiously; and is known to have been responsible for satisfactory installations similar to that specified during a period of at least immediate past five years.
- .5 Remove sealant and re-caulk disapproved joints.
- .6 Approved joints will establish minimum acceptable quality of workmanship and will serve as standard by which subsequent Work will be compared for Acceptance.

1.4 DELIVERY, STORAGE, AND HANDLING

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

1.5 ENVIRONMENTAL AND SAFETY REQUIREMENTS

- .1 Comply with requirements of Workplace Hazardous Materials Information System (WHMIS) regarding use, handling, storage, and disposal of hazardous materials; and regarding labeling and provision of material safety data sheets acceptable to local Labour regulations.

- .2 Conform to manufacturer's recommended temperatures, relative humidity, and substrate moisture content for application and curing of sealants including special conditions governing use.

1.6 WASTE MANAGEMENT AND DISPOSAL

- .1 Place materials defined as hazardous or toxic waste in designated containers.
- .2 Ensure emptied containers are sealed and stored safely for disposal away from children.
- .3 Dispose of surplus chemical and finishing materials in accordance with federal regulations.
- .4 Fold up metal banding, flatten, and place in designated area for recycling.
- .5 Use trigger operated spray nozzles for water hoses.
- .6 Return solvent and oil soaked rags for contaminant recovery and laundering or for proper disposal.
- .7 Use least toxic sealants, adhesives, sealers, and finishes necessary to comply with requirements of this section.
- .8 Close and seal tightly all partly used sealant containers and store protected in well ventilated fire-safe area at moderate temperature.
- .9 Place used hazardous sealant tubes and other containers in areas designated for hazardous materials.

PART 2 - PRODUCTS

2.1 SEALANT MATERIALS

- .1 Sealants and caulking compounds must:
 - .1 meet or exceed all applicable governmental and industrial safety and performance standards.
 - .2 be manufactured and transported in such a manner that all steps of process, including disposal of waste products arising therefrom, will meet requirements of all applicable governmental acts, by laws and regulations including.
- .2 Sealant and caulking compounds must be accompanied by detailed instructions for proper application so as to minimize health concerns and maximize performance, and information describing proper disposal methods.
- .3 Caulking that emits strong odours, contains toxic chemicals or is not certified as mould resistant to not be used in or near air handling units.

2.2 SEALANT MATERIAL DESIGNATIONS

- .1 Acceptable single component neutral cure silicone sealants for skylight related work include:
 - .1 CWS by Dow Corning; or
 - .2 795 by Dow Corning
- .2 Acceptable single component, moisture curing, polyurethane sealants for reglets and other roofing related flashing termination work include:

- .1 Dymonic by Tremco; or
- .2 CWS by Dow Corning
- .3 Butyl (for concealed skylight related sealant joints): Tremco Curtainwall Sealant or approved alternate.
- .4 Primers:
 - .1 Primers to be as recommended by sealant manufacturer.
- .5 Cleaners:
 - .1 Acceptable cleaners:
 - .1 Xylol
 - .2 Methylethylketone (MEK)
 - .3 Isopropyl Alcohol
 - .2 Surfaces to receive silicone sealants to not be cleaned with Xylol.
 - .3 All substrate materials to be cleaned with compatible cleaners.
- .6 Preformed Compressible and Non-Compressible back-up materials.
 - .1 Polyethylene:
 - .1 Extruded closed cell foam backer rod.
 - .2 Size: oversize 30 to 50 %.
 - .2 Bond Breaker Tape.
 - .1 Polyethylene bond breaker tape.
- .7 Compatibility: All materials in a sealant system to be compatible with each other, with substrate and any coating or waterproofing to be installed. sealants used with elastomeric coating or waterproofing systems must be approved by coating or waterproofing manufacturer.

2.3 JOINT PRIMER

- .1 Non-corrosive and non-staining type, compatible with joint forming materials and sealant. Primer as recommended by sealant manufacturer.

PART 3 - EXECUTION

3.1 PROTECTION

- .1 Protect existing facades from staining or contamination.
- .2 Protect public from falling debris during installation.
- .3 At end of each day's work or when stoppage occurs due to inclement weather, provide protection for completed work and materials out of storage. At no time shall unsealed joints be left open. If protection is required, then entire drop/bay to be adequately protected.

3.2 EXAMINATION

- .1 Before commencing Work, verify that joint configuration and surfaces have been provided as specified under Work of other Sections to meet intent of sealant Specification, that joint conditions will not adversely affect execution, performance or quality of completed Work and that they can be put into acceptable condition by means of preparation specified in this Section. Verify Site conditions together with manufacturer's representative of sealant to be applied.
- .2 Examine existing conditions and substrates upon which work of this section is dependent. Report to Consultant in writing any defects or discrepancies. Commencement of work implies acceptance of existing conditions and assuming full responsibility for finished condition of work.
- .3 Ascertain that sealers applied to sealant substrates are compatible with sealant used and that full bond between sealant and substrate is attained. Request samples of sealed or coated substrate from their fabricators for testing of compatibility and bond if necessary.
- .4 Examine sealant configuration for width and depth. Depth of joint should be 1/2 joint width with a minimum depth of 6mm (0.25") and a maximum depth of 13mm (0.5") unless specified otherwise. For fillet joints, a minimum of 6mm (0.25") adhesion between sealant and substrate must be achieved on both sides of joint unless specified otherwise.
- .5 Defective work resulting from application to unsatisfactory joint conditions will be considered responsibility of those performing work of this section.

3.3 SURFACE PREPARATION

- .1 Prepare surfaces in accordance with manufacturer's directions.
- .2 Before any sealant repairs are made, type of existing sealant to be determined. If uncertain as to type, then a sealant manufacturer technical representative to be contacted to confirm type. Only sealant compatible with existing to be installed as part of repairs. Urethane based sealants are not to be applied over existing silicone sealants.
- .3 Where existing, remove sealant completely. In no case shall new sealant be applied over old. In addition:
 - .1 Remove existing sealants, dust, oil, grease, oxidation, mill scale, coatings and all other loose material by cutting, brushing, scrubbing, scraping and/or grinding. In no case, however, shall components be damaged during surface preparation.
 - .2 Clean substrates with recommended solvent cleaner. Apply solvent with a clean cloth, pad or soft paper towel. Applicator cloth or towel to not leave fiber residue on substrate surface. Surface should be wiped clean and dried with a second clean cloth to ensure removal of contaminants. If substrate surfaces is still not clean, repeat procedures as needed. Change cloths frequently to prevent depositing contaminants from cloth onto substrate surface.
 - .3 Use method of surface preparation suitable for substrate, as recommended by sealant manufacturer and that does not damage existing finishes.
- .4 Examine joint sizes and conditions to establish correct depth to width relationship for installation of backup materials and sealants.
- .5 Do not apply sealants to joint surfaces treated with sealer, curing compound, water repellent, or other coatings unless tests have been performed to ensure compatibility of materials. Remove coatings as required.
- .6 Ensure joint surfaces are dry and frost free.

- .7 Remove loose particles present or resulting from routing by sweeping particles out with a dry brush, blowing out joints with oil free compressed air or by vacuuming joints prior to solvent cleaning.

3.4 PRIMING

- .1 Where necessary to prevent staining or for neat appearance, 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 Use only primer approved by sealant manufacturer for particular installation, applying in strict accordance with manufacturers printed recommendations.
- .4 Always pour primers onto rag or brush, do not dip rag or brush into container.
- .5 Prime only as much area that can be packed and caulked in a single day.
- .6 Do not apply excess primer, and apply primer only to areas which it will be contacted by sealant.

3.5 BACKUP MATERIAL

- .1 Apply bond breaker tape where installation of backer rod is not possible, three point adhesion needs to be eliminated or throat to width ratio needs to be created as per manufacturers recommendations.
- .2 When using backing material comprised of tubular or rod stock, avoid lengthwise stretching of material. Do not twist or braid backer material.
- .3 Provide a stiff blunt-surfaced wood or plastic installation tool, having shoulders designed to ride on finished surface and a protrusion of required dimensions to assure a uniform depth of backup material below sealant. Do not puncture exterior skin or surface of backer material. A screwdriver is prohibited for use on this project.
- .4 Using approved tool, smoothly and uniformly place backup material to depth indicated on drawings or otherwise required, compressing backer material 25% to 50% and securing a positive fit.
- .5 Install backing material to a depth to provide a caulked joint meeting depth requirement as set out in sealant manufacturer's specifications.

3.6 MIXING

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

3.7 APPLICATION

- .1 Sealant:
 - .1 Apply sealant in accordance with manufacturer's written instructions.
 - .2 Mask edges of joint where irregular surface or sensitive joint border exist to provide neat joint.
 - .3 Apply sealant in continuous beads.
 - .4 Apply sealant using gun with proper size nozzle.

- .5 Ensure that new sealant is adhered to substrates a minimum of 6 to 10 mm at each side of joint.
- .6 Use sufficient pressure to fill voids and joints solid.
- .7 Form surface of sealant with full bead, smooth, free from ridges, wrinkles, sags, air pockets, embedded impurities.
- .8 Tool exposed surfaces before skinning begins to give slightly concave shape. Tooling to be performed by proper metal or wood tool. Finger tooling joints will not be accepted.
- .9 Remove excess compound promptly as work progresses and upon completion.
- .2 Curing:
 - .1 Cure sealants in accordance with sealant manufacturer's instructions.
 - .2 Do not cover up sealants until proper curing has taken place.

3.8 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 masking tape after initial set of sealant.

END OF SECTION - 07 92 00