

SPECIFICATIONS FOR

GREENSTONE ROOFING PROJECT: PS-2019-03

BEARDMORE WATER TREATMENT PLANT

30 LOUISE AVENUE
BEARDMORE, ONTARIO

Prepared for:

The Municipality of Greenstone
P.O. Box 70, 1800 Main Street
Geraldton, Ontario P0T 1M0

Prepared by



300 – 150 Katimavik Road, Ottawa, Ontario K2L 2N2
T: 613-831-7293 | F: 613-831-3812 | www.fsaeng.com

FSA Project No.: 18367DO-3

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Part 1 General

1.1 GENERAL DESCRIPTION OF THE WORK

- .1 Work to be carried out under this Contract, Roof Replacement at Beardmore Water Treatment Plant, 30 Louis Avenue, Beardmore, Ontario.
- .2 Provide the necessary labour and materials to complete the removal of the existing roofing system, existing curbs, sheet metal flashings and membrane down to the existing structural deck and install new roofing system as specified herein.
- .3 The existing heaved top courses of masonry block along the exterior of the parapet are to be removed and replaced with a wood stud wall parapet with metal flashing.
- .4 The new roof system shall be as follows and as specified in the areas indicated on the drawings:
 - .1 Typical Roof System R1:
 - .1 Existing steel deck.
 - .2 13 mm gypsum board.
 - .3 Air/vapour barrier.
 - .4 2 x 50 mm polyiso insulation.
 - .5 Sloped polyiso insulation as indicated on the drawings.
 - .6 13 mm rigid high density board (HD board)
 - .7 60 mil (1.5 mm) Ethylene propylene diene monomer (EPDM sheet membrane).
 - .5 Supply and installation of related rough carpentry at parapets and curbs.
 - .6 Supply and installation of all sheet metal caps, counter flashings, scuppers, fascia and all other roof related metal flashings required to complete roof installation.
 - .7 Supply and installation of all sealants required to seal the transition of membrane and related metal flashing and the termination of sheet metal and non-membrane surfaces.
 - .8 Supply and installation of new exterior metal flashing on the exterior of the parapet, around the perimeter of the roof.

1.2 CONTRACT

- .1 The Standard Construction Document, CCDC 2, Stipulated Price Contract, 2008, shall form part of the Contract Documents for all projects. Project contracts will be issued in one of two methods.
- .2 The Standard Construction Document, CCDC 2, Stipulated Price Contract, 2008, shall form part of the Contract Documents with amendments to definitions as indicated hereafter.

1.3 DEFINITIONS

- .1 "CONSULTANT" and "Fishburn Sheridan & Associates Ltd." and "FSA" are synonymous.

- .2 "OWNER" and "The Corporation of the Municipality of Greenstone" and "Municipality of Greenstone" and "Greenstone " are synonymous.
- .3 "CONSTRUCTOR" and "CONTRACTOR" are synonymous.

1.4 OTHER CONTRACTORS

- .1 Other Contractors, Sub-Contractors and the Owner's own forces, may be performing work on the site at the same time as the Work is being done under this Contract. The successful bidder shall provide all reasonable co-operation and collaboration with these other forces to ensure a timely completion of the work, taking into consideration and without undermining its own role as the "Constructor".

1.5 USE OF THE SITE

- .1 Carry out the Work so as to have the least possible interference and disturbance to the normal use of the premises. The successful bidder is expected to include in the bid an allowance for the performance of off-hours work should it be required to conform with the above.
- .2 Maintain services to existing building and provide for personnel and vehicle access.
- .3 Restrict construction access to and from site to approved location. Do not allow construction traffic to block entrances or exits for any reason.
- .4 Co-ordinate any interference with Owner's operation in this area and abide by Owner's direction in this regard. In cases of conflicting requirements, Owner's operation takes precedence but all reasonable effort to accommodate Contractor's needs will be made.

1.6 EXISTING SERVICES

- .1 Before commencing work, establish location and extent of service lines in area of Work and notify Consultant of findings.
- .2 Remove abandoned service lines within 2.4 m of structures. Cap or otherwise seal lines at cut-off points as directed by Consultant.
- .3 Services are to be left operational unless otherwise authorized by Owner.
- .4 Unless otherwise specified, the Contractor will be responsible for disconnection, relocation, re-installation and extending all services required to facilitate work under this Contract. Co-ordinate work with the Owner and provide minimum 48 hours notification if services are to be interrupted.

1.7 CUTTING AND PATCHING

- .1 Generally patch and "make good" any and all surfaces cut, damaged, exposed, or disturbed to comply with any appropriate statutory requirements and to the Owner's acceptance.

1.8 PROTECTION OF PROPERTY

- .1 Protect surrounding private and public property from damage during the performance of the Work.

- .2 Be responsible for damage incurred.

1.9 PRECONSTRUCTION CONDITIONS

- .1 Prior to commencing mobilization, the Contractor shall record preconstruction conditions by photographing all items that could potentially be claimed by the Owner or Consultant as damaged during the course of the work.
- .2 These items should include adjacent wall areas, landscaping, pavement, windows, paint finishes and any roof top equipment on or adjacent to the subject roof.
- .3 Provide Consultant and Owner with photographic record of preconstruction photographs a minimum of 24 hours prior to commencing mobilization.
- .4 All such damages observed during final or post construction review that cannot be verified as pre-existing, are potentially considered the Contractor's responsibility to rectify.

1.10 FIRE PROTECTION

- .1 Provide and maintain temporary fire protection equipment during the performance of the Work as required by insurance companies and governing codes, regulations and by-laws having jurisdiction.
- .2 Work requiring the generation of open flames (welding, soldering, etc...) cannot be performed until an Owner's Permit has been issued. It is the responsibility of the successful bidder to apply for here said permit.
- .3 Open fires and burning of rubbish are not permitted on site.

1.11 OCCUPATIONAL HEALTH AND SAFETY

- .1 Follow the Ontario Provincial Occupational Health and Safety Act and Regulations for Construction Projects. For the purposes of the act, the person or company contracted to carry out the work shall be deemed the "**Constructor**".
- .2 Hazardous materials, not identified by the Owner, may be encountered at the worksite. Use all necessary precautions when handling such material. It is possible that asbestos may exist in some form and if encountered the Contractor is responsible to notify the Owner and to follow Ontario Ministry of Labour regulations governing the handling of asbestos in the workplace.
- .3 The Owner may cause those who do not comply with the O.H.S.A. and Regulations to be escorted from the site.
- .4 All entrances shall have overhead protection.

1.12 PROTECTION OF BUILDING FINISHES AND EQUIPMENT

- .1 Prevent movement, settlement, or other damage to other adjacent structures, utilities, and parts of building to remain in place. Provide bracing and shoring if required.
- .2 Keep noise, dust, and inconvenience to occupants to a minimum.
- .3 Protect building systems, services and equipment. Protect all furnishings within work area with (6 mil) polyethylene film during construction. Remove film during

non-construction hours and leave premises in clean, unencumbered and safe manner for normal daytime function.

- .4 Provide temporary dust tight screens, partitions, covers, railings, barricades, supports and/or other protection as required. Protect workers, finished areas of work and public.

1.13 PARKING

- .1 Limited parking is available on site.
- .2 All vehicles must be parked in designated parking areas (except for reasonable loading and unloading of equipment and/or materials to a local entrance). Failure to observe these requirements may result the vehicle being ticketed and/or towed

1.14 SIGNS AND ADVERTISEMENTS

- .1 No signs or advertisements of any description other than notices regarding safety shall be displayed at the Work Site without permission of the Owner.
- .2 Upon completion of the Work, all signs shall be removed except those specifically directed by the Owner to remain.

1.15 CLEAN-UP

- .1 Maintain the work area in tidy condition, free from the accumulation of waste products and debris.
- .2 Remove waste and materials regularly so as to maintain a tidy work site. Do not dispose of any waste in the Owner's facilities unless specifically directed to do so by authorised personnel.
- .3 Store materials in areas specially designated by the Owner. Dispose of this debris in a legal manner so as to avoid causing a hazard to occupants and visitors on site.

1.16 MATCHING

- .1 Where new work occurs in or adjacent to existing work, it is the intent that colours and textures of visible finishes within these areas shall be matched to the satisfaction of the Owner.

1.17 DISRUPTION OF SERVICES

- .1 The Contractor is responsible to provide adequate written notice to the Owner of any interruption of services (i.e., mechanical, electrical etc.) for the connection of new services or the alteration of existing.
- .2 The Contractor is expected to co-operate reasonably with the Owner in the scheduling of service interruptions.

1.18 SANITARY FACILITIES

- .1 Temporary sanitary facilities will be provided by the Constructor in compliance with the Occupational Health and Safety Act and Regulations for Construction Projects.

1.19 TEMPORARY FACILITIES

- .1 Any temporary facilities provided at the site by the Contractor must be removed upon completion of the work and the area used must be returned to the original condition.

1.20 DOCUMENTS REQUIRED

- .1 Maintain at the job site, one copy each of the following:
 - .1 Original Plans and Specifications and completed Form of Tender.
 - .2 Building Department stamped drawings if required.
 - .3 Any changes to Drawings or Details.
 - .4 Shop Drawings and any changes.
 - .5 Addenda.
 - .6 Change Orders.
 - .7 Site Instructions.
 - .8 Contractor's Safety Policy.
 - .9 Safety Data Sheets.

1.21 WORK SCHEDULE

- .1 Within 5 working days of intent to award, provide a schedule showing anticipated progress stages and final completion of the Work within the specified time period, indicating each trade and inter-phasing. Allow for expected poor weather days.

1.22 MAINTAIN WARRANTEES

- .1 Ensure that work of this Contract does not invalidate warrantees on adjacent work. Provide written confirmation and arrange and pay for all services and costs to ensure that warrantees on adjacent work are maintained.
- .2 The Contractor accepts full and complete responsibility of maintaining existing warrantees.

1.23 CHANGES IN WORK

- .1 All changes to the Contract Documents which result in an extra or credit to the Contract amount or time are not to be executed until written instructions have been received and the extra or credit agreed to in writing by all parties.
- .2 Execute variations, alterations and substitutions that do not affect the intent, function, duration, or Contract amount, as instructed by the Consultant.
- .3 Changes to the work that are considered urgent by the Owner shall be acted upon by the Contractor on the basis of a written field instruction to be confirmed by a Change Order. Costs are to be kept and presented along with all appropriate timesheet vouchers and bills of materials, or fixed sum if, work is done by a Sub-Contractor on a lump sum basis.

Part 2 Products

2.1 NOT USED

.1 Not used.

Part 3 Execution

3.1 NOT USED

.1 Not used.

END OF SECTION

Part 1 General

1.1 ACCESS AND EGRESS

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

1.2 USE OF SITE AND FACILITIES

- .1 Execute work with least possible interference or disturbance to normal use of premises. Make arrangements with Consultant to facilitate work as stated.
- .2 Maintain existing services to building and provide for personnel and vehicle access.
- .3 Where security is reduced by work provide temporary means to maintain security.

1.3 ALTERATIONS, ADDITIONS OR REPAIRS TO EXISTING BUILDING

- .1 Execute work with least possible interference or disturbance to building operations, occupants, public and normal use of premises. Arrange with Consultant to facilitate execution of work.

1.4 EXISTING SERVICES

- .1 Notify Consultant and utility companies of intended interruption of services and obtain required permission.
- .2 Where Work involves breaking into or connecting to existing services, give Consultant 48 hours of notice for necessary interruption of mechanical or electrical service throughout course of work. Keep duration of interruptions minimum. Carry out interruptions after normal working hours of occupants, preferably on weekends.
- .3 Provide for personnel, pedestrian and vehicular traffic.

1.5 SPECIAL REQUIREMENTS

- .1 Carry out noise generating Work Monday to Sunday from 10:00 am to 6:00 pm hours only and on statutory holidays.
- .2 Submit schedule in accordance within 5 days after award of Contract.
- .3 Ensure Contractor's personnel employed on site become familiar with and obey regulations including safety, fire, traffic and security regulations.
- .4 Keep within limits of work and avenues of ingress and egress.
- .5 Deliver materials outside of peak traffic hours 6:00 am to 7:30 am unless otherwise approved by Consultant.

1.6 SECURITY

- .1 Where security has been reduced by Work of Contract, provide temporary means to maintain security.
- .2 Contractor must comply with the College's security policy.
- .3 Security clearances:
 - .1 Personnel employed on this project will be subject to security check.
 - .2 Obtain requisite clearance, as instructed, for each individual required to enter premises.
 - .3 Personnel will be checked daily at start of work shift and provided with pass which must be worn at all times. Pass must be returned at end of work shift and personnel checked out.
 - .4 Contractor's personnel will require security clearance check with Ontario Police Services (OPS).

1.7 BUILDING SMOKING ENVIRONMENT

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

Part 2 Products

2.1 NOT USED

- .1 Not Used.

Part 3 Execution

3.1 NOT USED

- .1 Not Used.

END OF SECTION

Part 1 General

1.1 ADMINISTRATIVE

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

1.2 SHOP DRAWINGS AND PRODUCT DATA

- .1 Refer to CCDC 2.
- .2 The term "shop drawings" means drawings, diagrams, illustrations, schedules, performance charts, brochures and other data which are to be provided by Contractor to illustrate details of a portion of Work.
- .3 Submit drawings stamped and signed by professional engineer registered or licensed in Province of Ontario.
- .4 Indicate materials, methods of construction and attachment or anchorage, erection diagrams, connections, explanatory notes and other information necessary for completion of Work. Where articles or equipment attach or connect to other articles or equipment, indicate that such items have been co-ordinated, regardless of Section under which adjacent items will be supplied and installed. Indicate cross references to design drawings and specifications.

- .5 Allow 4 days for Consultant's review of each submission.
- .6 Adjustments made on shop drawings by Consultant are not intended to change Contract Price. If adjustments affect value of Work, state such in writing to Consultant prior to proceeding with Work.
- .7 Make changes in shop drawings as Consultant may require, consistent with Contract Documents. When resubmitting, notify Consultant in writing of revisions other than those requested.
- .8 Accompany submissions with transmittal letter, in duplicate, containing:
 - .1 Date.
 - .2 Project title and number.
 - .3 Contractor's name and address.
 - .4 Identification and quantity of each shop drawing, product data and sample.
 - .5 Other pertinent data.
- .9 Submissions include:
 - .1 Date and revision dates.
 - .2 Project title and number.
 - .3 Name and address of:
 - .1 Subcontractor.
 - .2 Supplier.
 - .3 Manufacturer.
 - .4 Contractor's stamp, signed by Contractor's authorized representative certifying approval of submissions, verification of field measurements and compliance with Contract Documents.
 - .5 Details of appropriate portions of Work as applicable:
 - .1 Fabrication.
 - .2 Layout, showing dimensions, including identified field dimensions, and clearances.
 - .3 Setting or erection details.
 - .4 Performance characteristics.
 - .5 Standards.
 - .6 Relationship to adjacent work.
- .10 After Consultant's review, distribute copies.
- .11 Submit an electronic copy of shop drawings for each requirement requested in specification Sections and as Consultant may reasonably request.
- .12 Submit an electronic copy of product data sheets or brochures for requirements requested in specification Sections and as requested by Consultant where shop drawings will not be prepared due to standardized manufacture of product.

- .13 Submit an electronic copy of certificates for requirements requested in specification Sections and as requested by Consultant.
 - .1 Statements printed on manufacturer's letterhead and signed by responsible officials of manufacturer of product, system or material attesting that product, system or material meets specification requirements.
 - .2 Certificates must be dated after award of project contract complete with project name.
 - .14 Submit an electronic copy of manufacturer's instructions for requirements requested in specification Sections and as requested by Consultant.
 - .1 Pre-printed material describing installation of product, system or material, including special notices and Material Safety Data Sheets concerning impedances, hazards and safety precautions.
 - .15 Submit an electronic copy of Manufacturer's Field Reports for requirements requested in specification Sections and as requested by Consultant.
 - .16 Documentation of the testing and verification actions taken by manufacturer's representative to confirm compliance with manufacturer's standards or instructions.
 - .17 Submit an electronic copy of Operation and Maintenance Data for requirements requested in specification Sections and as requested by Consultant.
 - .18 Delete information not applicable to project.
 - .19 Supplement standard information to provide details applicable to project.
 - .20 If upon review by Consultant, no errors or omissions are discovered or if only minor corrections are made, copies will be returned and fabrication and installation of Work may proceed. If shop drawings are rejected, noted copy will be returned and resubmission of corrected shop drawings, through same procedure indicated above, must be performed before fabrication and installation of Work may proceed.
- 1.3 MOCK-UPS**
- .1 Erect mock-ups in accordance with Division One.
- 1.4 CERTIFICATES AND TRANSCRIPTS**
- .1 Immediately after award of Contract, submit Workers' Compensation Board status.
 - .2 Submit transcription of insurance immediately after award of Contract.

Part 2 Products

2.1 NOT USED

.1 Not Used.

Part 3 Execution

3.1 NOT USED

.1 Not Used.

END OF SECTION

Part 1 General

1.1 ADMINISTRATIVE

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

1.2 SHOP DRAWINGS AND PRODUCT DATA

- .1 Refer to CCDC 2.
- .2 The term "shop drawings" means drawings, diagrams, illustrations, schedules, performance charts, brochures and other data which are to be provided by Contractor to illustrate details of a portion of Work.
- .3 Submit drawings stamped and signed by professional engineer registered or licensed in Province of Ontario.
- .4 Indicate materials, methods of construction and attachment or anchorage, erection diagrams, connections, explanatory notes and other information necessary for completion of Work. Where articles or equipment attach or connect to other articles or equipment, indicate that such items have been co-ordinated, regardless of Section under which adjacent items will be supplied and installed. Indicate cross references to design drawings and specifications.

- .5 Allow 4 days for Consultant's review of each submission.
- .6 Adjustments made on shop drawings by Consultant are not intended to change Contract Price. If adjustments affect value of Work, state such in writing to Consultant prior to proceeding with Work.
- .7 Make changes in shop drawings as Consultant may require, consistent with Contract Documents. When resubmitting, notify Consultant in writing of revisions other than those requested.
- .8 Accompany submissions with transmittal letter, in duplicate, containing:
 - .1 Date.
 - .2 Project title and number.
 - .3 Contractor's name and address.
 - .4 Identification and quantity of each shop drawing, product data and sample.
 - .5 Other pertinent data.
- .9 Submissions include:
 - .1 Date and revision dates.
 - .2 Project title and number.
 - .3 Name and address of:
 - .1 Subcontractor.
 - .2 Supplier.
 - .3 Manufacturer.
 - .4 Contractor's stamp, signed by Contractor's authorized representative certifying approval of submissions, verification of field measurements and compliance with Contract Documents.
 - .5 Details of appropriate portions of Work as applicable:
 - .1 Fabrication.
 - .2 Layout, showing dimensions, including identified field dimensions, and clearances.
 - .3 Setting or erection details.
 - .4 Performance characteristics.
 - .5 Standards.
 - .6 Relationship to adjacent work.
- .10 After Consultant's review, distribute copies.
- .11 Submit an electronic copy of shop drawings for each requirement requested in specification Sections and as Consultant may reasonably request.
- .12 Submit an electronic copy of product data sheets or brochures for requirements requested in specification Sections and as requested by Consultant where shop drawings will not be prepared due to standardized manufacture of product.

- .13 Submit an electronic copy of certificates for requirements requested in specification Sections and as requested by Consultant.
 - .1 Statements printed on manufacturer's letterhead and signed by responsible officials of manufacturer of product, system or material attesting that product, system or material meets specification requirements.
 - .2 Certificates must be dated after award of project contract complete with project name.
 - .14 Submit an electronic copy of manufacturer's instructions for requirements requested in specification Sections and as requested by Consultant.
 - .1 Pre-printed material describing installation of product, system or material, including special notices and Material Safety Data Sheets concerning impedances, hazards and safety precautions.
 - .15 Submit an electronic copy of Manufacturer's Field Reports for requirements requested in specification Sections and as requested by Consultant.
 - .16 Documentation of the testing and verification actions taken by manufacturer's representative to confirm compliance with manufacturer's standards or instructions.
 - .17 Submit an electronic copy of Operation and Maintenance Data for requirements requested in specification Sections and as requested by Consultant.
 - .18 Delete information not applicable to project.
 - .19 Supplement standard information to provide details applicable to project.
 - .20 If upon review by Consultant, no errors or omissions are discovered or if only minor corrections are made, copies will be returned and fabrication and installation of Work may proceed. If shop drawings are rejected, noted copy will be returned and resubmission of corrected shop drawings, through same procedure indicated above, must be performed before fabrication and installation of Work may proceed.
- 1.3 MOCK-UPS**
- .1 Erect mock-ups in accordance with Division One.
- 1.4 CERTIFICATES AND TRANSCRIPTS**
- .1 Immediately after award of Contract, submit Workers' Compensation Board status.
 - .2 Submit transcription of insurance immediately after award of Contract.

Part 2 Products

2.1 NOT USED

.1 Not Used.

Part 3 Execution

3.1 NOT USED

.1 Not Used.

END OF SECTION

Part 1 General

1.1 REFERENCES

- .1 Canada Labour Code, Part 2, Canada Occupational Safety and Health Regulations
- .2 Province of Ontario
 - .1 Occupational Health and Safety Act Projects, R.S.O. 1990, c.0.1, as amended and Regulations for Construction O. Reg. 213/91 as amended - Updated 2014.

1.2 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Submit in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Submit site-specific Health and Safety Plan: Within 5 days after date of Notice to Proceed and prior to commencement of Work. Health and Safety Plan must include:
 - .1 Results of site specific safety hazard assessment.
 - .2 Results of safety and health risk or hazard analysis for site tasks and operation found in work plan.
- .3 Submit copies of reports or directions issued by Federal, Provincial and Territorial health and safety inspectors.
- .4 Submit copies of incident and accident reports.
- .5 Submit WHMIS 2015 SDS - Safety Data Sheets.
- .6 Consultant will review Contractor's site-specific Health and Safety Plan and provide comments to Contractor within 3 days after receipt of plan. Revise plan as appropriate and resubmit plan to Consultant within 5 days after receipt of comments from Consultant.
- .7 Consultant's review of Contractor's final Health and Safety plan should not be construed as approval and does not reduce the Contractor's overall responsibility for construction Health and Safety.
- .8 On-site Contingency and Emergency Response Plan: address standard operating procedures to be implemented during emergency situations.

1.3 FILING OF NOTICE

- .1 File Notice of Project with Provincial authorities prior to beginning of Work.
- .2 Contractor shall be responsible and assume the Principal Contractor role for each work zone location and not the entire complex. Contractor shall provide a written acknowledgement of this responsibility with 2 weeks of contract award. Contractor to submit written acknowledgement to WSIB along with Notice of Project.
- .3 Contractor shall agree to install proper site separation and identification in order to maintain time and space at all times throughout life of project.

1.4 SAFETY ASSESSMENT

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

1.5 MEETINGS

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

1.6 GENERAL REQUIREMENTS

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

1.7 RESPONSIBILITY

- .1 Be responsible for health and safety of persons on site, safety of property on site and for protection of persons adjacent to site and environment to extent that they may be affected by conduct of Work.
- .2 Contractor will be responsible and assume the role Constructor as described in the Ontario Occupational Health and Safety Act and Regulations for Construction Projects.
- .3 Contractor shall be the Principal Contractor as described in the Ontario Health and Safety Act for the Construction for only their scope and areas of work as defined and described in this project specification.
- .4 Comply with and enforce compliance by employees with safety requirements of Contract Documents, applicable federal, provincial, territorial and local statutes, regulations, and ordinances, and with site-specific Health and Safety Plan.

1.8 COMPLIANCE REQUIREMENTS

- .1 Comply with Ontario Occupational Health and Safety Act, R.S.O. 1990, c. 0.1 and Ontario Regulations for Construction Projects, O. Reg. 213/91.
- .2 Comply with Occupational Health and Safety Act, Occupational Health and Safety
- .3 Comply with Occupational Health and Safety Regulations, 1996.
- .4 Comply with Canada Labour Code, Canada Occupational Safety and Health Regulations.

1.9 UNFORSEEN HAZARDS

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

1.10 POSTING OF DOCUMENTS

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

1.11 CORRECTION OF NON-COMPLIANCE

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

1.12 POWDER ACTUATED DEVICES

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

1.13 WORK STOPPAGE

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

Part 2 Products

2.1 NOT USED

- .1 Not used.

Part 3 Execution

3.1 NOT USED

- .1 Not used.

END OF SECTION

Part 1 General

1.1 REFERENCES

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

1.2 INSPECTION

- .1 Refer to CCDC 2.
- .2 Allow Consultant access to Work. If part of Work is in preparation at locations other than Place of Work, allow access to such Work whenever it is in progress.
- .3 Give timely notice requesting inspection if Work is designated for special tests, inspections or approvals by Consultant instructions, or law of Place of Work.
- .4 If Contractor covers or permits to be covered Work that has been designated for special tests, inspections or approvals before such is made, uncover such Work, have inspections or tests satisfactorily completed and make good such Work.
- .5 Consultant will order part of Work to be examined if Work is suspected to be not in accordance with Contract Documents.

1.3 REJECTED WORK

- .1 Refer to CCDC.
- .2 Remove defective Work, whether result of poor workmanship, use of defective products or damage and whether incorporated in Work or not, which has been rejected by Consultant as failing to conform to Contract Documents. Replace or re-execute in accordance with Contract Documents.
- .3 Make good other Contractor's work damaged by such removals or replacements promptly.
- .4 If in opinion of Consultant it is not expedient to correct defective Work or Work not performed in accordance with Contract Documents, Owner will deduct from Contract Price difference in value between Work performed and that called for by Contract Documents, amount of which will be determined by Consultant.

1.4 MOCK-UPS

- .1 Prepare mock-ups for Work specifically requested in specifications. Include for Work of Sections required to provide mock-ups.
- .2 Construct in locations acceptable to Consultant.
- .3 Prepare mock-ups for Consultant's review with reasonable promptness and in orderly sequence, to not cause delays in Work.
- .4 Failure to prepare mock-ups in ample time is not considered sufficient reason for extension of Contract Time and no claim for extension by reason of such default will be allowed.
- .5 If requested, Consultant will assist in preparing schedule fixing dates for preparation.
- .6 Mock-ups may remain as part of Work.

Part 2 Products

2.1 NOT USED

.1 Not Used.

Part 3 Execution

3.1 NOT USED

.1 Not Used.

END OF SECTION

Part 1 General

1.1 REFERENCES

- .1 Canadian Construction Documents Committee (CCDC)
 - .1 CCDC 2-2008, Stipulated Price Contract.
- .2 Canadian Standards Association (CSA International)
 - .1 CAN/CSA-S269.2-M1987(R2003), Access Scaffolding for Construction Purposes.
 - .2 CAN/CSA-Z321-96(R2001), Signs and Symbols for the Occupational Environment.
- .3 U.S. Environmental Protection Agency (EPA) / Office of Water
 - .1 EPA 832R92005, Storm Water Management for Construction Activities: Developing Pollution Prevention Plans and Best Management Practices.

1.2 SUBMITTALS

- .1 Provide submittals in accordance with Division One.

1.3 INSTALLATION AND REMOVAL

- .1 Prepare site plan indicating proposed location and dimensions of area to be fenced and used by Contractor, number of trailers to be used, avenues of ingress/egress to fenced area and details of fence installation.
- .2 Indicate use of supplemental or other staging area.
- .3 Provide construction facilities in order to execute work expeditiously.
- .4 Remove from site all such work after use.

1.4 SCAFFOLDING

- .1 Scaffolding in accordance with CAN/CSA-S269.2.

1.5 SITE STORAGE/LOADING

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

1.6 CONSTRUCTION PARKING

- .1 Parking permits will be required for all vehicles parked on college property. Permits are available for purchase at building E, room E120. Costs for parking shall be included in the bid submission.
- .2 All vehicles must be parked in a designated parking area (except for reasonable loading and unloading of equipment and/or materials to a local entrance). Failure to observe these requirements may result the vehicle being ticketed and/or towed.

1.7 EQUIPMENT, TOOL AND MATERIALS STORAGE

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

1.8 SANITARY FACILITIES

- .1 Provide sanitary facilities for work force in accordance with governing regulations and ordinances.
- .2 Post notices and take precautions as required by local health authorities. Keep area and premises in sanitary condition.

1.9 PROTECTION AND MAINTENANCE OF TRAFFIC

- .1 Provide access and temporary relocated roads as necessary to maintain traffic.
- .2 Maintain and protect traffic on affected roads during construction period except as otherwise specifically directed by Consultant.
- .3 Provide measures for protection and diversion of traffic, including provision of watch-persons and flag-persons, erection of barricades, placing of lights around and in front of equipment and work, and erection and maintenance of adequate warning, danger, and direction signs
- .4 Protect travelling public from damage to person and property.
- .5 Contractor's traffic on roads selected for hauling material to and from site to interfere as little as possible with public traffic.
- .6 Verify adequacy of existing roads and allowable load limit on these roads. Contractor: responsible for repair of damage to roads caused by construction operations.

1.10 CLEAN-UP

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

Part 2 Products

2.1 NOT USED

- .1 Not Used.

- Part 3** **Execution**
- 3.1** **NOT USED**
- .1 Not Used.

END OF SECTION

Part 1 General

1.1 REFERENCE STANDARDS

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

1.2 PROJECT CLEANLINESS

- .1 Maintain Work in tidy condition, free from accumulation of waste products and debris, other than that caused by Owner or other Contractors.
- .2 Remove waste materials from site at daily regularly scheduled times or dispose of as directed by Consultant. Do not burn waste materials on site, unless approved by Consultant.
- .3 Provide and use marked separate bins for recycling.
- .4 Dispose of waste materials and debris at designated dumping areas on Crown property, off site.
- .5 Clean interior areas prior to start of finishing work, and maintain areas free of dust and other contaminants during finishing operations.
- .6 Store volatile waste in covered metal containers, and remove from premises at end of each working day.
- .7 Provide adequate ventilation during use of volatile or noxious substances. Use of building ventilation systems is not permitted for this purpose.
- .8 Use only cleaning materials recommended by manufacturer of surface to be cleaned, and as recommended by cleaning material manufacturer.
- .9 Schedule cleaning operations so that resulting dust, debris and other contaminants will not fall on wet, newly painted surfaces nor contaminate building systems.

1.3 FINAL CLEANING

- .1 Refer to CCDC 2, GC 3.14.
- .2 When Work is Substantially Performed remove surplus products, tools, construction machinery and equipment not required for performance of remaining Work.
- .3 Remove waste products and debris other than that caused by others and leave Work clean and suitable for occupancy.
- .4 Prior to final review remove surplus products, tools, construction machinery and equipment.
- .5 Remove waste products and debris other than that caused by Owner or other Contractors.
- .6 Remove waste materials from site at regularly scheduled times or dispose of as directed by Consultant. Do not burn waste materials on site, unless approved by Consultant.
- .7 Make arrangements with and obtain permits from authorities having jurisdiction for disposal of waste and debris.

- .8 Clean and polish glass, mirrors, hardware, walls, and mechanical and electrical fixtures. Replace broken, scratched or disfigured glass.
- .9 Remove stains, spots, marks and dirt from decorative work, electrical and mechanical fixtures, furniture fitments, walls, and floors.
- .10 Clean lighting reflectors, lenses, and other lighting surfaces.
- .11 Vacuum clean and dust building interiors, behind grilles, louvres and screens.
- .12 Broom clean and wash exterior walks, steps and surfaces; rake clean other surfaces of grounds.
- .13 Remove dirt and other disfiguration from exterior surfaces.
- .14 Clean and sweep roofs, gutters, areaways, and sunken wells.
- .15 Sweep and wash clean paved areas.
- .16 Remove debris and surplus materials from crawl areas and other accessible concealed spaces.

1.4 WASTE MANAGEMENT AND DISPOSAL

- .1 Separate waste materials for recycling.

Part 2 Products

2.1 NOT USED

- .1 Not Used.

Part 3 Execution

3.1 NOT USED

- .1 Not Used.

END OF SECTION

Part 1 General

1.1 REFERENCES

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

1.2 ADMINISTRATIVE REQUIREMENTS

- .1 Acceptance of Work Procedures:
 - .1 Contractor's Inspection: Contractor: conduct inspection of Work, identify deficiencies and defects, and repair as required to conform to Contract Documents.
 - .1 Notify Consultant in writing of satisfactory completion of Contractor's inspection and submit verification that corrections have been made.
 - .2 Request Consultant's inspection.
 - .2 Consultant's Inspection:
 - .1 Consultant and Contractor to inspect Work and identify defects and deficiencies.
 - .2 Contractor to correct Work as directed.
 - .3 Completion Tasks: submit written certificates in English that tasks have been performed as follows:
 - .1 Work: completed and inspected for compliance with Contract Documents.
 - .2 Defects: corrected and deficiencies completed.
 - .3 Work: complete and ready for final inspection.
 - .4 Final Inspection:
 - .1 When completion tasks are done, request final inspection of Work by Consultant, and Contractor.
 - .2 When Work incomplete according to Owner and Consultant, complete outstanding items and request re-inspection.
 - .5 Declaration of Substantial Performance: when Consultant considers deficiencies and defects corrected and requirements of Contract substantially performed, make application for Certificate of Substantial Performance.
 - .6 Commencement of Lien and Warranty Periods: date of Owner's acceptance of submitted declaration of Substantial Performance to be date for commencement for warranty period and commencement of lien period unless required otherwise by lien statute of Place of Work.
 - .7 Final Payment:
 - .1 When Consultant considers final deficiencies and defects corrected and requirements of Contract met, make application for final payment.
 - .2 Refer to CCDC 2: when Work deemed incomplete by Consultant, complete outstanding items and request re-inspection.
 - .8 Payment of Holdback: after issuance of Certificate of Substantial Performance of Work, submit application for payment of holdback amount

in accordance with contractual agreement. Provide proof of publication of the Certificate of Substantial Performance.

1.3 FINAL CLEANING

.1 Clean in accordance with Division One.

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

Part 2 Products

2.1 NOT USED

.1 Not Used.

Part 3 Execution

3.1 NOT USED

.1 Not Used.

END OF SECTION

Part 1 General

1.1 ADMINISTRATIVE REQUIREMENTS

1.2 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Provide submittals in accordance with Division One.
- .2 One week prior to Substantial Performance of the Work, submit to the Consultant, two final copies of operating and maintenance manuals in English.
- .3 Provide evidence, if requested, for type, source and quality of products supplied.

1.3 FORMAT

- .1 Organize data as instructional manual.
- .2 Binders: vinyl, hard covered, 3 'D' ring, loose leaf 219 x 279 mm with spine and face pockets.
- .3 When multiple binders are used correlate data into related consistent groupings.
 - .1 Identify contents of each binder on spine.
- .4 Cover: identify binder with type or printed title 'Project Record Documents'; list title of project and identify subject matter of contents.
- .5 Arrange content by Section numbers and sequence of Table of Contents.

1.4 AS-BUILT DOCUMENTS AND SAMPLES

- .1 Maintain, in addition to requirements in General Conditions, at site, one record copy of:
 - .1 Contract Drawings.
 - .2 Specifications.
 - .3 Addenda.
 - .4 Change Orders and other modifications to Contract.
 - .5 Reviewed shop drawings, product data, and samples.
 - .6 Manufacturer's certificates.
- .2 Maintain record documents in clean, dry and legible condition.
 - .1 Do not use record documents for construction purposes.
- .3 Keep record documents and samples available for inspection by Consultant.

1.5 RECORDING INFORMATION ON PROJECT RECORD DOCUMENTS

- .1 Record as-built information on set of opaque drawings, provided by Consultant, and return drawings to Consultant at Substantial Performance of the Work.
- .2 Record information on set of black line opaque drawings, and in copy of Project Manual, provided by Consultant.

- .3 Use felt tip marking pens, maintaining separate colours for each major system, for recording information.
- .4 Record information concurrently with construction progress.
 - .1 Do not conceal Work until required information is recorded.
- .5 Contract Drawings and shop drawings: mark each item to record actual construction, including:
 - .1 Field changes of dimension and detail.
 - .2 Changes made by change orders.
 - .3 Details not on original Contract Drawings.
 - .4 References to related shop drawings and modifications.
- .6 Specifications: 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.
- .7 Other Documents: maintain manufacturer's certifications, inspection certifications, field test records, required by individual specifications sections.
- .8 Provide digital photos, if requested, for site records.

1.6 WARRANTIES AND BONDS

- .1 Submit 24-month labour warranty for materials workmanship, dated from the date of Substantial Performance.
- .2 Submit 20-year membrane material warranty.
- .3 Assemble approved information in binder, submit upon acceptance of work and organize binder as follows:
 - .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.
- .4 Respond in timely manner to oral or written notification of required construction warranty repair work.
- .5 Written verification to follow oral instructions.
 - .1 Failure to respond will be cause for the Consultant to proceed with action against Contractor.

Part 2 Products

2.1 NOT USED

- .1 Not Used.

Part 3 Execution

3.1 NOT USED

.1 Not Used.

END OF SECTION

Part 1 General

1.1 RELATED SECTIONS

- .1 Section 04 05 13 – Masonry Mortar and Grouting.
- .2 Section 07 92 00 – Joint Sealants.

1.2 REFERENCES

- .1 Canadian Standards Association (CSA International)
 - .1 CAN/CSA-A371-04 (R2014), Masonry Construction for Buildings.
- .2 International Masonry Industry All-Weather Council (IMIAC)
 - .1 Recommended Practices and Guide Specification for Hot and Cold Weather Masonry Construction.

1.3 ADMINISTRATIVE REQUIREMENTS

- .1 Conduct pre-installation meeting one week prior to commencing work of this Section and on-site installations to:
 - .1 Verify project requirements, including mock-up requirements.
 - .2 Verify substrate conditions.
 - .3 Co-ordinate products, installation methods and techniques.
 - .4 Sequence work of related sections.
 - .5 Co-ordinate with other building subtrades.
 - .6 Review manufacturer's installation instructions.
 - .7 Review masonry cutting operations, methods and tools and determine worker safety and protection from and minimizing dust during cutting operations.
 - .8 Review warranty requirements.

1.4 ACTION SUBMITTALS

- .1 Provide submittals in accordance with Division One.
- .2 Product Data:
 - .1 Provide manufacturer's printed product literature, specifications and datasheet and include product characteristics, performance criteria, limitations and colours.
 - .2 Provide electronic copies of Workplace Hazardous Materials Information System (WHMIS) - Safety Data Sheets (SDS).
- .3 Shop Drawings:
 - .1 Provide shop drawings in accordance with Division One.

1.5 INFORMATION SUBMITTALS

- .1 Certificates: provide manufacturer's product certificates certifying materials comply with specified requirements.

1.6 CLOSEOUT SUBMITTALS

- .1 Provide manufacturer's instructions for care, cleaning and maintenance of prefaced masonry units for incorporation into manual specified in Division One.

1.7 MAINTENANCE MATERIAL SUBMITTALS

- .1 Provide manufacturer's instructions in accordance with Division One.

.2 QUALITY ASSURANCE

.3 Qualifications:

- .1 Manufacturer: capable of providing field service representation during construction and approving application method.
- .2 Installer: experienced in performing work of this section who has specialized in installation of work similar to that required for this project.
- .3 Masons: company or person specializing in masonry installations with 5 years documented experience with masonry work similar to this project.
 - .1 Masons employed on this project must demonstrate ability to reproduce mock-up standards.

.4 Mock-ups:

- .1 Construct mock-ups in accordance with Division One.
- .2 Mock-up used:
 - .1 To judge workmanship, substrate preparation, operation of equipment and material application.
- .3 Construct mock-up where directed by Consultant.
- .4 Allow 24 hours for inspection of mock-up by Consultant before proceeding with work.
- .5 When accepted by Consultant, mock-up will demonstrate minimum standard for this work. Mock-up may remain as part of finished work.
- .6 Start work only upon receipt of written acceptance of mock-up by Consultant.

1.8 DELIVERY, STORAGE, AND HANDLING

- .1 Deliver materials in accordance with Division One.
- .2 Deliver, store and handle materials in accordance with manufacturer's written instructions.
- .3 Storage and Handling Protection:
 - .1 Keep materials dry until use except where wetting of bricks is specified.

- .2 Store under waterproof cover on pallets or plank platforms held off ground by means of plank or timber skids.
- .3 Packaging Waste Management:
 - .1 Remove for reuse, recycling and return of pallets, crates, padding, and packaging materials.

1.9 SITE CONDITIONS

- .1 Ambient Conditions: assemble and erect components when temperatures are above 4°C.
- .2 Weather Requirements: to CSA-A371 and to IMIAC - Recommended Practices and Guide Specifications for Hot and Cold Weather Masonry Construction.
- .3 Cold weather requirements:
 - .1 To CSA-A371 with following requirements.
 - .1 Maintain temperature of mortar between 5°C and 50°C until batch is used or becomes stable.
 - .2 Maintain ambient temperature of masonry work and its constituent materials between 5°C and 50°C and protect site from wind chill.
 - .3 Maintain temperature of masonry above 0°C for minimum of 28 days, after mortar is installed, or as per manufacturer's written instructions.
 - .4 Preheat unheated wall sections in enclosure for minimum 72 hours above 10°C, before applying mortar.
 - .2 Hot weather requirements:
 - .1 Protect freshly laid masonry from drying too rapidly, by means of waterproof, non-staining coverings.
 - .2 Keep masonry dry using waterproof, non-staining coverings that extend over walls and down sides sufficient to protect walls from wind driven rain, until masonry work is completed and protected by flashings or other permanent construction.
 - .3 Spray mortar surface at intervals and keep moist for maximum of three days after installation.

1.10 WARRANTY

- .1 For Work in this Section 04 05 00 - Common Work Results for Masonry, 12 months warranty period is extended to 24 months.

Part 2 Products

2.1 MANUFACTURERS

- .1 Ensure manufacturer has minimum 5 years' experience in manufacturing components similar to or exceeding requirements of project.

2.2 MATERIALS

- .1 Masonry materials are specified elsewhere in related Sections:
 - .1 Section 04 05 13 – Masonry Mortar and Grouting.

2.3 TOOLS

- .1 Grinders: Only grinders with integrated vacuum are allowed for the Work.
 - .1 Acceptable tool: DCG-5000S by Hilti, or approved equivalent.
- .2 Other tools as required to suit Work.

Part 3 Execution

3.1 INSTALLERS

- .1 Experienced and qualified masons to carry out erection, assembly and installation of masonry work.

3.2 MANUFACTURER'S INSTRUCTIONS

- .1 Compliance: comply with manufacturer's written data, including product technical bulletins, product catalogue installation instructions, product carton installation instructions, and data sheets.

3.3 EXAMINATION

- .1 Examine conditions, substrates and work to receive work of this Section.
 - .1 Verify field conditions are acceptable.
 - .2 Commencing installation means acceptance of existing substrates.

3.4 QUANTITY SURVEY

- .1 Provide for the supervising mason to examine all masonry surfaces in conjunction with Consultant who will determine the quantities of repair.
- .2 Organize the work and access to the work so that all masonry surfaces can be examined in 1 day, at the same time as the visits by Consultant to review the work in progress.
- .3 Mark out repairs using a marking method acceptable to the Consultant.
- .4 Record the quantity and location of repairs using a method acceptable to the Consultant, with a copy to the Consultant at the time of the survey.
- .5 Repair quantities to be determined include:
 - .1 Damaged mortar joints to be repointed.
 - .2 Allow to repoint 100 linear meters in the base bid price.

3.5 PREPARATION

- .1 Surface Preparation: prepare surface in accordance with manufacturer's written recommendations.
- .2 Establish and protect lines, levels, and coursing.
- .3 Protect adjacent materials from damage and disfiguration.

3.6 INSTALLATION

- .1 Do masonry work in accordance with CSA-A371 except where specified

3.7 CONSTRUCTION

- .1 Jointing:
 - .1 Allow joints to set just enough to remove excess water, then tool with round jointer to provide smooth, joints true to line, compressed, uniformly concave joints where concave joints are indicated.
- .2 Cutting:
 - .1 Cut out deteriorated mortar joints, using grinder with integrated vacuum to minimize airborne dust.
 - .2 Make cuts straight, clean, and free from uneven edges.
- .3 Building-In:
 - .1 Build in items required to be built into masonry.
 - .2 Prevent displacement of built-in items during construction. Check plumb, location and alignment frequently, as work progresses.
- .4 Control Joints:
 - .1 Construct continuous control joints as indicated.

3.8 SITE TOLERANCES

- .1 Tolerances in notes to CSA-A371 apply.

3.9 CLEANING

- .1 Progress Cleaning: in accordance with related masonry sections.
- .2 Final Cleaning:
 - .1 Perform cleaning after installation to remove construction and accumulated environmental dirt.
 - .2 Upon completion of installation and verification of performance of installation, remove surplus materials, rubbish, tools and equipment barriers.
- .3 Waste Management: separate waste materials for reuse and recycling.
 - .1 Divert unused or damaged masonry units from landfill.

3.10 PROTECTION

- .1 Temporary Bracing:
 - .1 Provide temporary bracing of masonry work during and after erection until permanent lateral support is in place.
 - .2 Bracing approved by Consultant.
 - .3 Brace masonry walls as necessary to resist wind pressure and lateral forces during construction.
- .2 Moisture Protection:
 - .1 Keep masonry dry using waterproof, non-staining coverings that extend over walls and down sides sufficient to protect walls from wind driven rain, until completed and protected by flashing or other permanent construction.
 - .2 Cover completed and partially completed work not enclosed or sheltered with waterproof covering at end of each work day. Anchor securely in position.

END OF SECTION

Part 1 General

1.1 RELATED REQUIREMENTS

- .1 Section 04 05 00 - Common Work Results for Masonry.

1.2 REFERENCE STANDARDS

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

1.3 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Submit in accordance with Division One.
- .2 Product Data:
 - .1 Submit manufacturer's instructions, printed product literature and data sheets for masonry mortar and grout and include product characteristics, performance criteria, physical size, finish and limitations.
 - .2 Submit 2 copies of WHMIS SDS in accordance with Division One.
 - .3 Indicate VOC's mortar, grout, parging, colour additives and admixtures. Expressed as grams per litre (g/L).
- .3 Manufacturers' Instructions: submit manufacturer's installation instructions.

1.4 DELIVERY, STORAGE AND HANDLING

- .1 Deliver, store and handle materials in accordance with Section with manufacturer's written instructions and as per Division One.
- .2 Delivery and Acceptance Requirements: deliver materials to site in original factory packaging, labelled with manufacturer's name and address.
- .3 Storage and Handling Requirements:
 - .1 Store materials in dry location, indoors, off ground and in accordance with manufacturer's recommendations in clean, dry, well-ventilated area.
 - .2 Store and protect masonry mortar and grout packages from nicks, scratches, and blemishes.
 - .3 Replace defective or damaged materials with new.

- .4 Waste Management and Disposal: as per Division One.

1.5 SITE CONDITIONS

- .1 Ambient Conditions: maintain materials and surrounding air temperature to:
 - .1 Minimum 5°C prior to, during, and 48 hours after completion of masonry work.
 - .2 Maximum 32°C prior to, during, and 48 hours after completion of masonry work.
- .2 Weather Requirements: International Masonry Industry All-Weather Council (IMIAC) - Recommended Practices and Guide Specifications for Cold Weather Masonry Construction.

Part 2 Products

2.1 MATERIALS

- .1 Use same brands of materials and source of aggregate for entire project.
- .2 Repointing Mortar:
 - .1 Premixed, prepackaged cementitious Mortar Cement: to CAN/CSA-A3002 and CAN/CSA A179, Type N.
 - .2 Standard of acceptance:
 - .1 King 1-1-6, as manufactured by KPM Industries Ltd.
 - .2 Or accepted alternate.
- .3 Water: clean and potable.

2.2 COLOUR ADDITIVES

- .1 Use colouring admixture not exceeding 10% of cement content by mass, or integrally coloured masonry cement, to produce coloured mortar to match approved sample. Admixtures approved prior to use. Use in accordance with specific manufacturer's recommendations.

2.3 ADMIXTURES

- .1 Admixtures, including air-entraining admixtures, are to be only as determined by the Mortar Manufacturer's technical representative on site.
- .2 Do not use anti-freeze compounds including calcium chloride or chloride based compounds

2.4 MORTAR MIXING

- .1 Use pre-blended, pre-coloured mortar prepackaged under controlled factory conditions. Ingredients batching limitations to within 1% accuracy.

Part 3 Execution

3.1 EXAMINATION

- .1 Verification of Conditions: verify that conditions of substrate previously installed under other Sections or Contracts are acceptable for masonry installation in accordance with manufacturer's written instructions.

3.2 CONSTRUCTION

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

3.3 MIXING

- .1 Use only premixed, prepackaged materials.
- .2 Pointing mortar can be mixed using a regular paddle mixer. Mixing by hand pre-approved by Consultant.
- .3 Clean mixing boards and mechanical mixing machine between batches.
- .4 Mortar: weaker than units it is binding.
- .5 Contractor to appoint one individual to mix mortar, for duration of project. In event that this individual is changed, mortar mixing must cease until new individual is trained, and mortar mix is tested.

3.4 MORTAR PLACEMENT

- .1 Install premix mortar to manufacturer's instructions.
- .2 Install mortar to requirements of CAN/CSA-A179.
- .3 Install mortar to requirements of Section 04 05 00 - Common Work Results for Masonry.

3.5 CLEANING

- .1 Progress Cleaning: clean in accordance with Division One.
 - .1 Leave Work area clean at end of each day.
- .2 Remove droppings and splashings using clean sponge and water.
- .3 Clean masonry with low pressure clean water and soft natural bristle brush.
- .4 Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment in accordance with Division One.
- .5 Waste Management and Disposal: as per Division One.

END OF SECTION

Part 1 General

1.1 RELATED SECTIONS

- .1 Section 07 62 00 – Sheet Metal Flashing and Trim.
- .2 Section 07 92 00 – Joint Sealants.

1.2 REFERENCES

- .1 ASTM International
 - .1 ASTM A653/A653M-11, Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
- .2 CSA International
 - .1 CSA A123.22-08 (R2013) - Self-Adhering Polymer Modified Bituminous Sheet Materials Used as Steep Roofing Underlayment for Ice Dam Protection.
 - .2 CSA B111-1974 (R2003), Wire Nails, Spikes and Staples.
 - .3 CSA O141-05 (R2009), Softwood Lumber.
- .3 National Lumber Grades Authority (NLGA)
 - .1 Standard Grading Rules for Canadian Lumber 2010.

1.3 QUALITY ASSURANCE

- .1 Lumber identification: by grade stamp of an agency certified by Canadian Lumber Standards Accreditation Board.
- .2 Plywood identification: by grade mark in accordance with applicable CSA Standards.

1.4 MOCK-UPS

- .1 Provide a 600 mm mock-up of wood blocking system, including closures for each detail or profile for review in a location designated by the Consultant.
- .2 Review mock-up to ensure design intent can be achieved. Verify all intersecting and adjoining elevations to ensure that continuity of roofing and closures can be achieved. Verify attachment, methods for securing and pullout strengths to ensure that work can support the anticipated loads and will remain in place against all wind, weather and service conditions without warping or deforming.

1.5 PRECAUTIONS

- .1 Provide temporary protection, to the satisfaction of the Consultant, to render all wood blocking watertight, if for any reason permanent membrane protection cannot be provided within the same day. Ensure the base of any curbs are temporarily sealed to prevent water from entering below the curb assembly, or

behind sheathing, should the roof assembly not be completed on the same day as the carpentry work.

1.6 DELIVERY, STORAGE, AND HANDLING

- .1 Deliver, store and handle materials in accordance with Section with manufacturer's written instructions.
- .2 Delivery and acceptance requirements: deliver materials to site in original factory packaging, labelled with manufacturer's name and address.
- .3 Storage and handling requirements:
 - .1 Store materials off ground, indoors, in dry location and in accordance with manufacturer's recommendations in clean, dry, well-ventilated area.
 - .2 Store materials off ground with moisture barrier at both ground level and as a cover forming a well-ventilated enclosure, with drainage to prevent standing water.
 - .3 Replace defective or damaged materials with new.

Part 2 Products

2.1 LUMBER MATERIAL

- .1 Lumber: Unless specified otherwise, softwood, S4S, moisture content 19% or less in accordance with following standards:
 - .1 CSA O141.
 - .2 NLGA Standard Grading Rules for Canadian Lumber.
- .2 Furring, blocking, nailing strips, grounds, rough bucks, curbs, fascia backing and sleepers:
 - .1 S2S is acceptable for all surfaces.
 - .2 Board sizes: "Standard" or better grade.
 - .3 Dimension sizes: "Standard" light framing or better grade.

2.2 PANEL MATERIALS

- .1 Canadian softwood plywood (CSP): to CSA 0151.
 - .1 Urea-formaldehyde free.

2.3 FASTENERS

- .1 Wood to wood fasteners: Wood screw #12 or as indicated, galvanized flat head, of sufficient length to completely penetrate through base minimum 25 mm.
- .2 Plywood to concrete, brick or hollow masonry fasteners: 6 mm diameter screws. Length to provide minimum 32 mm and maximum 40 mm embedment into substrate as required. Type to be approved subject to results of pull tests.
 - .1 Standard of acceptance:

- .1 Tapcon.
- .2 Or accepted alternate.
- .3 Expansion fasteners for wood plates and steel to concrete deck: AISI Type 304 stainless steel, with stainless nuts and washers.
 - .1 Standard of acceptance:
 - .1 Hilti Kwik Bolt TZ.
 - .2 Or accepted alternate.
- .4 Exposed fasteners for metal to wood or masonry: Use #10 cadmium plated hex screws with neoprene and steel washers. Minimum length 38 mm. Use lead shields, as required for anchoring. Colour of screw head to meet approval of Consultant.
 - .1 Standard of acceptance:
 - .1 Atlas Bolt.
 - .2 Rawl.
 - .3 Or accepted alternate.

2.4 ACCESSORIES

- .1 Self-adhered membrane: To CSA A123.22, self-adhering membrane consisting of SBS rubberized asphalt compound laminated to a polyethelene film. Minimum thickness 1 mm.
 - .1 Standard of acceptance:
 - .1 Blueskin SA by Henry Bakor.
 - .2 GoldShield by IKO.
 - .3 Soprastick 1100 by Soprema.
 - .4 Or accepted alternate.
- .2 Semi-rigid insulation: semi-rigid mineral wool, rockwool, or slagwool boards, to CAN/ULC 702.2.

2.5 FINISHES

- .1 Galvanizing: To ASTM A653/A653M, use galvanized fasteners for all work.
- .2 Interior paint: 2 coats interior acrylic latex, colour to match existing, eggshell.

Part 3 Execution

3.1 GENERAL INSTALLATION

- .1 Extend air/vapour barrier seals up vertical surfaces and curbs and onto the deck as shown on the Drawings, to provide continuity.
- .2 Slope the top of all wood blocking at the roof perimeter in towards the roof at a minimum of 5%, unless otherwise shown on the Drawings.

- .3 Comply with requirements of NBC, supplemented by the following paragraphs.
- .4 Install furring and blocking as required to space-out and support casework, cabinets, wall finishes, facings, fascia, siding and other work as required.
- .5 Align and plumb faces of furring and blocking to tolerance of 1:600.
- .6 Install rough bucks, nailers and linings to rough openings as required to provide backing for frames and other work.
- .7 Install wood, fascia backing, nailers, curbs and other wood supports as required and secure using galvanized steel fasteners.
- .8 Install wood backing, dressed, tapered and recessed slightly below top surface of roof insulation for roof hopper.

3.2 SECUREMENT OF WOOD BLOCKING

- .1 Comply with more stringent requirements as required by drawings or Ontario Building Code requirements. Increase number and spacing of all fasteners by 50% for 2400 mm from all outside roof corners.
- .2 Install fasteners to the design intent to hold all wood blocking permanently in place to prevent warping, deflection and to resist all wind and weather conditions.
- .3 Secure wood to concrete in a staggered pattern with each row spaced at minimum 600 mm c/c with specified fasteners. Drill holes 13 mm deeper than depth of fastener penetration.
- .4 Install fasteners in two rows in the direction of the grain, offset one to another in a staggered fashion by approximately 50%. All fasteners shall be placed minimum 10 mm from any edge of framing.
- .5 Unless specified otherwise, the number of fasteners shall be doubled at all outside parapet corners, for a distance of 3 m from the corner.
- .6 For any exposed fastening, provide touch-up paint as required to coat all exposed surfaces of screws damaged during the driving process.

3.3 SHEATHING INSTALLATION

- .1 Plywood:
 - .1 Not less than 2 mm gaps shall be provided between sheets, to allow for material expansion.
 - .2 Unless otherwise indicated, fasten plywood with a minimum of thirty-six fasteners per 1200 mm x 2400 mm sheet.

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.
- .3 Bevel leading edge of wood panel products on vertical applications to facilitate membrane installation and as detailed on drawings.

END OF SECTION

Part 1 General

1.1 REFERENCES

- .1 ASTM International Inc.
 - .1 ASTM D4637-04, Standard Specification for EPDM Sheet Used In Single-Ply Roof Membrane.
- .2 Canadian Roofing Contractors' Association (CRCA)
 - .1 CRCA Roofing Specification Manual 1997.
- .3 Health Canada/Workplace Hazardous Materials Information System (WHMIS 2015)
 - .1 Safety Data Sheets (SDS).
- .4 Underwriters' Laboratories of Canada (ULC)
 - .1 CAN/ULC-S702.2-03, Standard for Mineral Fibre Thermal Insulation for Buildings.
 - .2 CAN/ULC-S704-03, Thermal Insulation, Polyurethane and Polyisocyanurate Boards, Faced.

1.2 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Provide submittals in accordance with Division One.
- .2 Product Data:
 - .1 Provide manufacturer's printed product literature, specifications and datasheets for membranes and insulation and include product characteristics, performance criteria, physical size, finish and limitations.
 - .2 Provide two copies of WHMIS 2015 SDS.
- .3 Provide shop drawings:
 - .1 Indicate membrane flashing, reinforced joints, tape, penetrations and field fabricated seams details.
 - .2 Provide layout for tapered insulation.
- .4 Test and Evaluation Reports: submit laboratory test reports certifying compliance of roofing membrane with specification requirements.
 - .1 Compatibility of materials: submit written declaration to Consultant as described in PART 2, PERFORMANCE CRITERIA.
- .5 Manufacturer's Installation Instructions: indicate special precautions required for seaming the membrane.

1.3 QUALITY ASSURANCE

- .1 Installer qualifications: company or person specializing in application of EPDM roofing systems with 5 years documented experience and approved by manufacturer.

1.4 DELIVERY, STORAGE AND HANDLING

- .1 Deliver, store and handle materials in accordance with manufacturer's written instructions.
- .2 Storage and Handling Requirements:

- .1 Provide and maintain dry, off-ground weatherproof storage.
- .2 Store materials on supports to prevent deformation.
- .3 Remove only in quantities required for same day use.
- .4 Store uncured flashing and jointing materials to prevent premature curing and freezing.
- .5 Store insulation protected from sunlight and weather and deleterious materials.
- .6 Store roofing materials in accordance with manufacturer's written instructions, to prevent damage or loss of performance.

1.5 SITE CONDITIONS

- .1 Ambient Conditions: Apply EPDM membrane only when surfaces and ambient temperatures are within manufacturers' prescribed limits.
 - .1 Do not install EPDM membrane when air and substrate temperature remains below 5 degrees C and in accordance with manufacturer's recommendations or when wind chill gives equivalent cooling effect.
 - .2 Install EPDM membrane on dry substrate, free of snow and ice. Use only dry materials and apply only during weather that will not introduce moisture into system.

1.6 WARRANTY

- .1 For the Work of this Section 07 53 23 - Ethylene-Propylene-Diene-Monomer Roofing, 12 months warranty period is extended to 60 months.
- .2 Membrane: Provide a 20-year manufacturer's warranty.

Part 2 Products

2.1 DESCRIPTION - ROOFING SYSTEM

- .1 1.5 mm (60 mil) EPDM elastomeric membrane roofing consisting of: non-reinforced membrane for use in a fully adhered system.
- .2 Inside and outside corners, reinforcements around parapets, curbs, and closures to conform to the membrane manufacturer's recommendations

2.2 PERFORMANCE CRITERIA

- .1 Compatibility between components of system and adjacent materials is essential.
 - .1 Provide a written declaration to Consultant stating that all materials and components, as assembled in system, meet this requirement.
- .2 Roofing system: to CSA A123.21 for wind uplift resistance.

2.3 VAPOUR RETARDER

- .1 Self-adhesive modified bituminous air/vapour barrier, factory laminated to a tri-laminate woven, high-density polyethylene top surfacing suitable for adhering insulation, to be compatible with EPDM membrane.
- .2 Thickness: minimum thickness 0.85 mm.

- .3 Standard of acceptance:
 - .1 As recommended by the EPDM membrane manufacturer.

2.4 MEMBRANE

- .1 Ethylene propylene diene monomer (EPDM sheet membrane): to ASTM D4637.
 - .1 Type 1, Class A, 1.5 mm (60 mil) thick, non-reinforced membrane for use in fully adhered system.
 - .2 Self-curing, EPDM based membrane for use as flashing as required by membrane manufacturer.
- .2 Acceptable Manufacturer:
 - .1 Firestone
 - .2 Carlisle
 - .3 Johns Manville

2.5 POLYISOCYANURATE INSULATION (INORGANIC)

- .1 Conforming to CAN/ULC S704, rigid foam board, Class 2 or 3, Type 3. Manufactured with HC blowing agent meeting requirements of CAN/ULC S-126, CAN/ULC S107 and CAN/ULC S770 for LTTR values. Approved and listed by Factory Mutual Global for 1-60 and 1-90 wind classification and FM 4450 requirements for Class 1 fire. Thickness as specified or shown with maximum board size 1200 mm x 1200 mm. Fibre-reinforced **inorganic facers** on both major surfaces of the core foam.

2.6 SLOPED INSULATION (INORGANIC)

- .1 Conforming to CAN/ULC S704, rigid foam board, Class 2 or 3, Type 3. Manufactured with HC blowing agent meeting requirements of CAN/ULC S-126, CAN/ULC S107 and CAN/ULC S770 for LTTR values. Approved and listed by Factory Mutual Global for 1-60 and 1-90 wind classification and FM 4450 requirements for Class 1 fire. Thickness as specified or shown with maximum board size 1200 mm x 1200 mm. Fibre-reinforced **inorganic facers** on both major surfaces of the core foam.
- .2 Insulation slopes shall be as indicated on the detailed drawings and roof plans. Modules shall be factory cut to correct slopes.
- .3 Sloped insulation must terminate at 0 thickness. Supply an additional nosing piece if required, factory fabricated of compatible, flame-resistant sloped rigid insulation material, to smoothly terminate sloped insulation at 0 thickness.

2.7 COVER BOARD (HD BOARD)

- .1 High density board (HD board): 13 mm rigid, roof insulation panel composed of a high density, closed-cell polyisocyanurate foam core laminated to glass fibre-mat facer specifically designed for use as a cover board, as recommended by the membrane manufacturer.

2.8 INSULATION ADHESIVE

- .1 Adhesive for securing cover board and insulation: To be fully compatible with all materials in the roofing assembly. Applicability of use to adhere the different materials in the roofing assembly to be included in the manufacturer's literature.
 - .1 Standard of acceptance:
 - .1 Thermostik 880-33 by Henry Bakor.
 - .2 Duotack by Soprema.
 - .3 Millenium by IKO.
 - .4 Fas-n-free by Tremco.
 - .5 Insta-Stick by Instafoam Inc.
 - .6 Roof Assembly Adhesive by Chemlink.
 - .7 Olybond 500 by OMG.
 - .8 2-Part UIA by Johns Manville.
 - .9 Or accepted alternate.

2.9 SEALERS

- .1 Sealants: In accordance with Section 07 92 00 - Joint Sealants.

2.10 FASTENERS

- .1 Membrane to substrate: fasteners and spacing as recommended by manufacturer.

2.11 FASTENING

- .1 Bar, with prepunched holes and screws.
- .2 Screws and washers as recommended by manufacturer.

2.12 ADHESIVES, TAPES AND PRIMERS

- .1 Adhesive, tapes and primers, in accordance with manufacturer's recommendations.

2.13 PLUMBING VENTS FLASHING

- .1 Field fabricated double-wrap, pressure sensitive flashing terminated with stainless steel clamping ring, and sealed with a continuous lap sealant.
 - .1 Acceptable product: As recommended by the membrane manufacturer.

2.14 SCUPPERS

- .1 See Section 07 62 00 – Sheet Metal Flashing and Trim.

2.15 CONCRETE PAVERS

- .1 Concrete pavers: to CSA A231.1, 600 x 600 x 50 mm thick of sizes indicated natural, air entrained precast concrete paving slabs having non-slip finish with 51 mm plain margin around perimeter.

Part 3 Execution

3.1 QUALITY OF WORK

- .1 Compliance: comply with manufacturer's written recommendations, including product technical bulletins, handling, storage and installation instructions, and datasheets.
- .2 Do examination, preparation and roofing Work in accordance with Roofing Manufacturer's Specification Manual and CRCA Roofing Specification Manual.

3.2 SUBSTRATE EXAMINATION

- .1 Verification of Conditions: examine substrates and immediately inform Consultant in writing of defects.
- .2 Evaluation and Assessment: prior to beginning work ensure:
 - .1 Substrates are firm, straight, smooth, dry, free of snow, ice or frost, and swept clean of dust and debris.
 - .2 Parapets have been built.
 - .3 Scuppers have been installed at proper elevations relative to finished surfaces.
 - .4 Plywood and lumber nailer plates have been installed to walls and parapets as indicated.

3.3 PROTECTION OF IN-PLACE CONDITIONS

- .1 Cover walls, walks, sloped roofs and adjacent work where materials hoisted or used.
- .2 Use warning signs and barriers:
 - .1 Maintain in good order until completion of Work.
- .3 Dispose of rain water away from face of building until scuppers installed and connected to downspouts.
- .4 Protect from traffic and damage:
 - .1 Comply with precautions deemed necessary by Consultant.
- .5 Place plywood runways over work to enable movement of material and other traffic.
- .6 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.
- .7 Seal exposed edges.
- .8 If metal connectors used, treat connectors and decking with rust proofing or galvanization.

3.4 SELF-ADHESIVE AIR/VAPOUR BARRIER

- .1 Ensure all surfaces to be covered with self-adhering membrane are complete and free of moisture and contaminants and are above 5°C. At temperatures below 5°C heat materials to be covered with hot air gun. Store all materials in heated storage when temperatures fall below 5°C and remove only as much material that can be used before cooling.

- .2 Prime all vertical surfaces to be covered with self-adhering membrane and horizontal surfaces, as required. Use roller application – no spray application permitted. Let primer tack dry and complete thumb test to test set-up.
- .3 Working up slope from low points, remove paper backing and install membrane true to line to completely cover the area intended to be protected to points.
- .4 Ensure end laps and side laps are fully supported and roll or work material into place by hand to ensure a positive bond.
- .5 Membrane is to be installed without air blisters and wrinkles. Rework, repair or replace all poorly installed membrane. Do not stretch material that would result in pull back and deformity of the membrane at intersections.
- .6 Lap all side laps 75 mm and end laps 150 mm.
- .7 Turn up membrane at edge where horizontal surface meets vertical planes, as shown on Drawings. Lap onto existing surfaces as required to provide continuity of air/vapour barrier at terminations.
- .8 Seal all points of termination at horizontal planes and vertical surfaces with sealant Type “F”. Tool sealant to consistent smooth and even surface.

3.5 INSULATION – ALL LAYERS – ADHESIVE ADHERED

- .1 Attach insulation as per the OBC Wind Uplift Attachment detail illustrated on the drawings.
- .2 Install base insulation layer over air/vapour barrier to specified design intent and thickness. Secure insulation laid with adhesive, in pattern as per adhesive manufacturer's directions and as indicated. Apply boards before adhesive cures, skims over or loses adhesive qualities.
- .3 For subsequent layers of insulation, secure insulation laid with adhesive, in pattern as per adhesive manufacturer's recommendations and as indicated.
- .4 Stagger all joints of insulation a minimum 300 mm.
- .5 Stagger both end and side joints between insulation layers.
- .6 Butt sheets of insulation with moderate contact. Do not force insulation into place. Cut neatly at projections and points of termination. Replace all broken, damaged or misfit boards as work progresses.
- .7 Where necessary, back-cut insulation to allow it to conform and stay bonded to irregular surfaces without bridging. Subsequent to placement, walk insulation into place to ensure positive bonding is achieved.

3.6 SLOPED INSULATION

- .1 Attach boards as per the OBC Wind Uplift Attachment detail illustrated on the drawings.
- .2 At all locations, provide sloped insulation shop drawings from sloped insulation manufacturer for Consultant's review prior to installation.

- .3 Provide sloped polyisocyanurate insulation to create crickets between scuppers to promote positive drainage. Total sump size to be as shown on drawings, with maximum depression of 25 mm, unless otherwise indicated.
- .4 Installation methods for sloped insulation to be same as for upper layers of base insulation, using adhesive as specified.
- .5 At the low termination of sloped insulation, when applying overlay board, Contractor shall increase adhesive application by adding 4 additional ribbons at 100 mm spacing at the 13 mm elevation change from tapered to flat insulation, to compensate for the 13 mm elevation change of tapered insulation.

3.7 COVER BOARD (HD BOARD)

- .1 Installation methods for high density insulation board (HD) board to be same as for upper layers of base insulation, using adhesive as specified, and in accordance with manufacturer's written instructions.

3.8 FULLY-ADHERED EPDM MEMBRANE ROOFING APPLICATION

- .1 Membrane, adhered, exposed application:
 - .1 Position membrane over HD insulation board starting at highest point.
 - .2 Allow membrane to relax for 1/2 hour.
 - .3 Apply adhesive to membrane and substrate in accordance with manufacturer's written instructions.
- .2 Lap joints:
 - .1 Clean both mating surfaces, apply primer and splicing contact cement in accordance with manufacturer's written instructions.
 - .2 Apply double-sided adhesive tape in accordance with manufacturer's written instructions.
 - .3 Solvent clean edge and apply lap sealant.
 - .4 Perimeter securement with adhesive, in accordance with manufacturer's written instructions.
- .3 Edge securement:
 - .1 Attach fastening strips to mechanically secure membrane. Ensure screws penetrate into wood nailers.
 - .2 Adhesive recommended by manufacturer.
- .4 Flashings:
 - .1 Install cured or uncured EPDM membrane flashings in accordance with manufacturer's written instructions.
- .5 Penetrations:
 - .1 Install vent flashing and other penetration flashings and seal to membrane in accordance with manufacturer's recommendations and details.

3.9 SCUPPERS AND OVERFLOWS

- .1 As required by the Summary of Work and drawings, install new overflow scuppers as indicated.

- .2 Install new scuppers, downspouts and concrete pavers to requirements of the Summary of Work, drawings and details.
- .3 Verify that location will allow for positive drainage and will not conflict with existing facilities or entrance ways.
- .4 Verify that drainage to lower levels can be adequately accommodated without problems.
- .5 Reduce insulation thickness minimum 25 mm, 1200 mm from scupper to provide positive roof drainage and ensure water flow will not be impeded.
- .6 Install scupper, plumb, level and true to line. Secure flanges to the substrate at outer edges at a minimum of four locations.
- .7 Provide new downspouts in conformity with Summary of Work, drawings and details. See Section 07 62 00 - Sheet Metal Flashing and Trim for specification of eavestroughs and downspouts.

3.10 FIELD QUALITY CONTROL

- .1 Inspection:
 - .1 Inspection and testing of EPDM membrane application will be carried out by the Consultant and the manufacturer's technical representative.
- .2 Testing:
 - .1 Cut tests: Allow one 300 mm x 300mm cut test per each roof area, or more as deemed necessary by the Consultant.

3.11 CLEAN UP

- .1 At all times, keep the premises free from accumulation of waste materials or rubbish. Stock piling of debris on the roof will not be permitted.
- .2 Repair defects in surface to leave the roof in an even consistent finish.
- .3 Leave roof clear of debris by spills and machine tracking.
- .4 Leave grounds and building free of debris spread by pedestrian traffic where applicable.
- .5 Clean surfaces and penetrations of all contaminants and touch up to the satisfaction of the Owner. Include rooftop equipment, curbs, soil stacks, sleeves, gas lines, vents, drains and ladders.
- .6 Check drains to ensure they are functional and where required remove all debris by vacuum.
- .7 At the completion of the work remove all rubbish, tools, equipment and surplus materials.
- .8 Be responsible to repair and pay all costs and fees required to rectify damage caused by work of the Contract with materials and finish to match original.

END OF SECTION

Part 1 General

1.1 RELATED SECTIONS

- .1 Section 06 10 53 – Miscellaneous Rough Carpentry.
- .2 Section 07 53 23 – Ethylene Propylene Diene Monomer Roofing.
- .3 Section 07 92 00 – Joint Sealants.

1.2 REFERENCE STANDARDS

- .1 American Society for Testing and Materials International (ASTM)
 - .1 ASTM A653/A653M-15e1, Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
 - .2 ASTM B32-08(2014), Standard Specification for Solder Metal.
 - .3 ASTM D523-14, Standard Test Method for Specular Gloss.
- .2 Canadian Standards Association (CSA International)
 - .1 CSA A123.3-05(2015), Asphalt Saturated Organic Roofing Felt.
 - .2 CSA A123.22-08(2013), Self-Adhering Polymer Modified Bituminous Sheet Materials Used as Steep Roofing Underlayment for Ice Dam Protection.
 - .3 CSA B111-1974(R2003), Wire Nails, Spikes and Staples.
- .3 Canadian Roofing Contractors Association (CRCA)
 - .1 Roofing Specifications Manual 2012.
- .4 Health Canada/Workplace Hazardous Materials Information System (WHMIS 2015)
 - .1 Safety Data Sheets (SDS).
- .5 Sheet Metal and Air Conditioning Contractors Association of North America (SMACNA)
 - .1 Architectural Sheet Metal Manual – 2012.

1.3 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Submit to the Consultant a list of materials intended for use before they are ordered.
- .2 Product Data:
 - .1 Submit manufacturer's printed product literature including product specifications and technical data sheets for sheet metal flashing fasteners and accessory materials. Include product characteristics, performance criteria, physical size, finish and limitation.
 - .2 Submit copies of WHMIS 2015 SDS - Safety Data Sheets

1.4 COORDINATION

- .1 Coordinate work of this Section with Related Work specified in other Sections to ensure construction schedule is maintained and watertightness and protection of the building and finished work is maintained at all times.

1.5 EXAMINATION

- .1 Do not commence work until surface to be covered has been inspected.
- .2 Inspect work and advise the Consultant of conditions that would adversely affect the work of this trade.
- .3 Commencement of work is proof that the Contractor has accepted surfaces as satisfactory for intended operations and accepts responsibility for appearances and performance of completed work.
- .4 Repair damaged and inferior work caused by work of this Contract with materials and finish to match original to the Consultant's approval.

1.6 DELIVERY, STORAGE AND HANDLING

- .1 Deliver, store and handle materials in accordance with manufacturer's written instructions.
- .2 Safety: Comply with requirements of Workplace Hazardous Materials Information System (WHMIS 2015) regarding use, handling, storage, and disposal of materials.
- .3 Manufacturer's recommendations for handling and storing products are to be considered a minimum requirement.
- .4 Materials shall be delivered to the site, undamaged and in their original packages, with manufacturer's labels visible, attesting to their conformity to specific standards.

Part 2 Products

2.1 GENERAL

- .1 All standards, regulations and specifications listed herein are considered to be the latest available edition.
- .2 Compatibility between materials is essential. Use only materials that are known to be compatible when incorporated in a completed assembly.

2.2 PREFINISHED SHEET METAL FLASHING

- .1 Pre-finished metal flashings: As shown on drawings, fabricate from 0.65 mm (24 ga.) steel to ASTM A653 Grade 230 with G90 zinc coating. Surface with Perspectra Series baked enamel finish. Colour to match existing from manufacturer's standard colour range.

2.3 ACCESSORIES

- .1 Metal cleat: Same material as metal flashings, 50 mm wide @ 600 mm c/c.
- .2 Continuous metal starter strip: 0.71 mm (24 ga.) galvanized steel, secured at 400 mm c/c.
- .3 Nails: Annular threaded nails of length to penetrate into bases minimum 25 mm. No. 8 screws to penetrate wood 19 mm at 600 mm c/c.
- .4 Masonry fasteners: Tapcon, Permagrip or Tapgrip or Rawl. Spike sized to penetrate concrete 38 mm minimum as specified or shown.
- .5 Exposed fasteners: Where exposed fasteners are specified or as shown, use #10 screws with metal and neoprene washers pre-finished to match colour of flashing. Alternatively, use screws with colour match nylon caps where shown or approved by the Consultant.
- .6 Screws for starter strips and fascia: #8 @ 400 mm c/c.
- .7 Sealant: Refer to Drawings and Section 07 92 00 – Joint Sealants.
- .8 Touch-up paint: As recommended by prefinished material manufacturer.

2.4 FABRICATION

- .1 Fabricate metal flashings and other sheet metal work in accordance with applicable details, as indicated. Where not indicated, follow applicable CRCA 'FL' series details and SMACNA architectural details.
- .2 Metal shall be formed on a bending brake, shaping trimmed and hard seaming shall be done on bench, as far as practicable, with proper sheet metal working tools. Angles of bends and folds for interlocking metal shall be made with full regard to expansion and contraction to avoid buckling and to avoid damaging metal surfaces.
- .3 Fabricate all possible work in shop in maximum 2400 mm lengths by brake forming, bench cutting, drilling and shaping. Match existing profiles where metal flashing is to be repaired.
- .4 Hem exposed edges on underside 13 mm. Mitre and seal corners with sealant.
- .5 Form sections square, true and accurate to size, free from distortion and other defects detrimental to appearance or performance.
- .6 Dry joints are to be tight but not dented so as to permit slight adjustments of sheets and yet remain watertight.
- .7 Lock seams at all corners.
- .8 Apply isolation coating to metal surfaces to be embedded in concrete or mortar.

- .9 Supply all accessories required for installation of sheet metal work of this Section. Fabricate accessories of same material to which they will be used.

2.5 SCUPPERS

- .1 Form scupper flashings from same material as other metal flashings, unless otherwise indicated.
- .2 Scupper to have minimum 125 mm roof flange and gravel guard to Consultant's approval. Make all seams continuous and watertight by soldering or heat welding.
- .3 Scupper to have a minimum width of 200 mm to allow proper drainage.

2.6 EAVESTROUGHS AND DOWNSPOUTS

- .1 Form eavestroughs and downspouts from 0.65 mm (24 ga.) prefinished steel or 0.81 mm (20 ga.) prefinished aluminum, as indicated.
- .2 Eavestroughs to be 125 mm wide at top, 'K' profile, unless otherwise indicated.
- .3 Downspout to be 100 mm corrugated square profile, unless otherwise indicated.
- .4 Provide goosenecks, outlets and fastening straps from matching material.

Part 3 Execution

3.1 MANUFACTURER'S INSTRUCTIONS

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

3.2 SHEET METAL FLASHING INSTALLATION

- .1 Install sheet metal flashings at copings, walls, expansion joints, roof openings and other components required to protect the membrane flashings as shown on the drawings or otherwise required. Where not indicated, follow applicable CRCA 'FL' series details.
- .2 Install continuous concealed starter strips at all exterior faces. Install cleats between lock joints and as indicated to permanently hold flashing in place. Install hook strip fasteners with 2 fasteners per cleat.
- .3 Sheet metal work shall be installed to cover the entire area it protects and shall be watertight under all service and weather conditions. Install in a uniform manner, true to line, free of dents, warping and distortion.
- .4 Back-paint sheet metal that comes into contact with another kind of metal, masonry or concrete with bituminous paint at the rate of 0.15 L/m².

- .5 Install sheet metal with concealed fasteners at lock joints. Exposed fastening will only be permitted with the approval of the Consultant. When exposed fasteners are shown, space all fasteners evenly in an approved manner. Use lead plugs and screws with neoprene washers where fasteners are exposed, otherwise use concrete drive fasteners where metal flashings are installed over concrete masonry.
- .6 Install weather barrier membrane under sheet metal where indicated.
- .7 Self-Adhered Membrane Flashing:
 - .1 Install 1-ply of self-adhered EPDM membrane flashing to detail under sheet metal on horizontal or vertical surfaces that are not otherwise covered by membrane flashings.
 - .2 Ensure all surfaces to be covered with self-adhered membrane are complete and free of moisture and contaminants. At temperatures below 5°C (40°F) heat materials to be covered with hot air gun. Store all materials in heated storage above 5°C (40°F) and remove only as much material as can be used before cooling.
 - .3 Prime all surfaces to be covered with self-adhered membrane. Let primer tack dry and complete thumb test to ensure.
 - .4 Remove paper backing and install membrane true to line to completely cover the area intended to be protected to points shown on the drawing.
 - .5 Roll or work material into place by hand to ensure a positive bond.
 - .6 Membrane to be installed without air blisters and wrinkles. Rework, repair or replace all poorly installed membrane. Do not stretch material that would result in pull back and deformity of the membrane at intersections.
 - .7 It is recommended that all self-adhering membrane be installed by a team of two workmen. Avoid working in windy conditions or weather that would result in inferior product.
- .8 Join sheet metal by "S" lock seams, to permit thermal movement. Seal all fasteners and completely fill all joints with Type 'B' sealant as flashing is being installed. Clean off all excessive visible material subsequent to installation.
- .9 When flashing is being installed in more than one piece, offset joints in adjacent flashings by approximately 50%.
- .10 Form inside and outside corners by means of locked seams. Do not use pop rivets unless accepted by Consultant.
- .11 Slope all metal to interior of roof area to maintain slope, unless otherwise indicated. Do not form open joints or pockets that fail to drain water.

3.3 SCUPPERS

- .1 Install scuppers as indicated with a minimum width of 200 mm.
- .2 Fasten to substrate on three sides and prime surfaces.

3.4 EAVESTROUGHS AND DOWNSPOUTS

- .1 Install eavestroughs and secure to building at 750 mm on centre with eavestrough spikes through spacer ferrules.
 - .1 Slope eavestrough continuously to downspout to promote positive drainage.
 - .2 Seal joints watertight.
- .2 Install downspouts and provide goosenecks back to wall.
 - .1 Secure downspouts to wall with straps at 1800 mm on centre, minimum 2 straps per downspout.
 - .2 Connect downspouts to drainage system where present.
 - .3 Install splash pads unless otherwise indicated.

3.5 CLEANING

- .1 On completion and verification of performance of installation, remove surplus materials, excess materials, rubbish, tools and equipment. Remove and replace all sheet metal sections that received surface damage or scratches during fabrication, delivery or installation.
- .2 For scratches and scuffs to be retained in the new installation, use touch up paint recommended by the metal material supplier.
- .3 Leave work areas clean, free from grease, finger marks and stains.

END OF SECTION

Part 1 General

1.1 RELATED SECTIONS

- .1 Section 06 10 53 – Miscellaneous Rough Carpentry.
- .2 Section 07 53 23 – Ethylene Propylene Diene Monomer Roofing.
- .3 Section 07 62 00 – Sheet Metal Flashing and Trim.

1.2 REFERENCES

- .1 Canadian General Standards Board (CGSB)
 - .1 CAN/CGSB-19.13-M87, Sealing Compound, One Component, Elastomeric, Chemical Curing.
 - .2 CAN/CGSB-37.5-M89, Cutback Asphalt Plastic Cement.
- .2 Health Canada/Workplace Hazardous Materials Information System (WHMIS 2015)
 - .1 Safety Data Sheets (SDS).

1.3 COORDINATION

- .1 Coordinate work of this Section with Related Work specified in other Sections to ensure construction schedule is maintained and watertightness and protection of the building and finished work is maintained at all times.

1.4 EXAMINATION

- .1 Do not commence work until surface to be covered has been inspected.
- .2 Inspect work and advise the Consultant of conditions that would adversely affect the work of this trade.
- .3 Commencement of work is proof that the Contractor has accepted surfaces as satisfactory for intended operations and accepts responsibility for appearances and performance of completed work.

1.5 DELIVERY, STORAGE AND HANDLING

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

1.6 ENVIRONMENTAL AND SAFETY REQUIREMENTS

- .1 Comply with requirements of Workplace Hazardous Materials Information System (WHMIS 2015) regarding use, handling, storage and disposal of hazardous materials; and regarding labeling and provision of safety data sheets acceptable to Labour Canada.

- .2 Conform to manufacturer's recommended temperatures, relative humidity and substrate moisture content for application and curing of sealants including special conditions governing use.
- .3 In confined spaces provide portable supply of outside air and exhaust fans to ensure fumes will not impact workmen or building occupants.
- .4 Compatibility is essential in use of any materials that will be compatible when incorporated in finished assembly.

Part 2 Products

2.1 MATERIALS

- .1 Sealants acceptable for use on this project must be listed on CGSB Qualified Products List issued by CGSB Qualification Board for Joint Sealants. Where sealants are qualified with primers use only these primers.
- .2 Modified bitumen sealant (Sealant Type 'A'):
 - .1 For penetration and terminations of bituminous and modified bituminous membrane: To CAN/CGSB-37.5. As recommended by membrane manufacturer.
 - .2 Standard of acceptance:
 - .1 Sopramastic 200 by Soprema.
 - .2 MBR Flashing Cement by Johns Manville.
 - .3 Polybitume 570-05 by Henry Bakor.
 - .4 Or accepted alternate.
 - .3 Urethanes one part (Sealant Type 'B'):
 - .1 For sealing metal flashing, non-sag: To CAN/CGSB-19.13, Type 2, MCG-2-25, colour to match surfaces.
 - .2 Standard of acceptance:
 - .1 Dymonic by Tremco.
 - .2 Sonolastic NP1 Ultra by Sonneborn.
 - .3 Or accepted alternate
 - .4 One Part Sealant (Sealant Type 'F'):
 - .1 One-part moisture cure, medium modulus sealant to be compatible with EPDM.
 - .2 Acceptable Product:
 - .1 HE925-BES Sealant by Henry or approved equal:

2.2 JOINT CLEANER

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

2.3 PRIMER

- .1 As recommended by sealant manufacturer for specific substrate adhesion.

Part 3 Execution

3.1 PROTECTION

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

3.2 PREPARATION OF JOINT SURFACES

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

3.3 PRIMING

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

3.4 BACKUP MATERIAL

- .1 Apply bond breaker tape where required to manufacturer's instructions.
- .2 Install joint filler to achieve correct joint depth and shape, with approximately 30% compression.

3.5 APPLICATION

- .1 Sealant - General:
 - .1 Apply sealant when air and substrate temperatures are not forecast to be less than minimum recommended by manufacturer. Do not work during inclement weather. Perform all work in accordance with manufacturer's written instructions.
 - .2 Mask edges of joint where irregular surface or sensitive joint border exists to provide neat joint.

- .3 Apply sealant in continuous beads.
 - .4 Apply sealant using gun with proper size nozzle.
 - .5 Use sufficient pressure to fill voids and joints solid.
 - .6 Form surface of sealant with full bead, smooth, free from ridges, wrinkles, sags, air pockets and embedded impurities.
 - .7 Tool exposed surfaces before skinning begins to give slightly concave shape.
 - .8 Remove excess compound promptly as work progresses and upon completion.
 - .9 The use of liquid tooling aids, such as soapy water or alcohols, are prohibited as they may impact effective sealant cure, adhesion and potentially cause aesthetic issues.
- .2 Sealant Type 'A':
- .1 Install sealant Type 'A' to be installed around at all air/vapour barrier protrusions including soil stacks, sleeves, and fasteners.
- .3 Curing:
- .1 Cure sealants in accordance with sealant manufacturer's instructions.
 - .2 Do not cover up sealants until proper curing has taken place.
- .4 Install sealant Type 'B' at sheet metal terminations.
- .5 Install sealant Type "F" to seal the EPDM flashing with the pipe.

3.6 CLEANING

- .1 Clean adjacent surfaces immediately and leave work neat and clean.
- .2 Remove excess droppings using recommended cleaners as work progresses.
- .3 Remove masking tape after initial set of sealant.
- .4 Clean all contaminated surfaces to Owner's acceptance.
- .5 Remove all rubbish and surplus materials from the job site on a daily basis.

3.7 PROTECTION

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

END OF SECTION