ROOF SPECIFICATIONS

THE TOWNSHIP OF ESQUIMALT – CITY HALL ROOFING PROJECT
1229 Esquimalt Rd
Esquimalt, BC V9A 3P1

Invitation to Bid
Date: November 1, 2024

1.1 GENERAL

1.2 HOURS OF WORK

.1 Use of all equipment to be in accordance with local noise bylaws.

1.3 DISPOSAL BINS

.1 The Contractor is responsible to keep the area around any disposal bin swept clean.

1.4 SANITARY FACILITIES

.1 Provide washroom facilities for workers as necessary.

1.5 ROOF ACCESS

.1 There will be no interior access to the roof. Supply, set-up, maintain and remove scaffolding, man-lift platforms and/or swing-stages during performance of Work to access work areas. Contractor to provide complete shop drawings bearing seal of a Professional Engineer, licensed to practice in Place of Work. Work to include review and approval of installed scaffolding by Designer. Allowance should be made for access to all elevations of building.

1.6 PROTECTION OF WORK AND PROPERTY

.1 The Contractor shall protect the property adjacent to the Work site from damage as a result of his operations under the Contract. Likewise, the Contractor shall protect the Work and the Owner's property from damage as a result of his operations.

1.7 CONTRACTOR'S USE OF SITE

.1 The laws of the place of building shall govern the Work. The Contractor shall comply with laws, ordinances, rules and regulations relating to work and shall obtain and/or pay all Permits, Notices, Fees, Taxes, Duties, as may be required.

.2 Do not unreasonably encumber the Place of Work with materials or equipment.

.3 Do not overload the structure.

.4 Do not close or obstruct or store materials in roadways, sidewalks or passageways without prior approval from the Owner. Do not interfere with safe passage to and from the building and adjacent public sidewalks and roads. Move stored products or equipment that interferes with operations of the building.

.5 Take all precautions and provide all required protection to ensure the safety of the general public.

.6 Build a safe, temporary scaffolding structure to access the roof level. No access through

inside of the building will be granted.

1.8 JOB SITE SAFETY

.1 Safety is of paramount importance at all stages of the roofing project and it is understood that the British Columbia Construction Safety Association and WorkSafe BC will be considered the minimum standard. Failure to adhere to this standard may require the project to temporarily shut down.

.2 The Contractor shall, for the purposes of the Workers Compensation Act, and for the duration of the Work of this Contract:
1) be the "prime contractor" for the "work site", and
2) do everything that is reasonably practicable to establish and maintain a system or process that will ensure compliance with the Act and its regulations, as required to ensure the health and safety of all persons at the "work site".

.3 The Contractor shall direct all Subcontractors, Sub-subcontractors, Other Contractors, employers, workers and any other persons at the "work site" on safety related matters, to the extent required to fulfill its "prime contractor" responsibilities pursuant to the Act, regardless of:
1) whether or not any contractual relationship exists between the Contractor and any of these entities, and
2) whether or not such entities have been specifically identified in this Contract.

.4 As per the requirements of the Workers Compensation Act Part 3, Division 3, Section 118(1-3) which states:
1) Coordination of multiple-employer workplaces 118(1) In this section: “multiple-employer workplace” means a workplace where workers of 2 or more employers are working at the same time; “prime contractor” means, in relation to a multiple-employer workplace,
(a) the directing contractor, employer or other person who enters into a written agreement with the owner of that workplace to be the prime contractor for the purposes of this Part, or
(b) if there is no agreement referred to in paragraph (a), the owner of the workplace.
2) The prime contractor of a multiple-employer workplace must
(a) ensure that the activities of employers, workers and other persons at the workplace relating to occupational health and safety are coordinated, and
(b) do everything that is reasonably practicable to establish and maintain a system or process that will ensure compliance with this Part and the regulation in respect to the workplace.
3) Each employer of workers at a multiple-employer workplace must give to the prime contractor the name of the person the employer has designated to supervise the employer’s workers at that workplace.

2.0 PRODUCTS

Not applicable.

3.0 EXECUTION

Not applicable.

END OF SECTION

PART 1 - GENERAL

1.1 DESCRIPTION

.1 This section includes Applications for Progress Payments.

1.2 REFERENCES

.1 Canadian Construction Documents Committee (CCDC): CCDC-2 2020, Stipulated Price Contract.

1.3 SUBMITTALS

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

1.4 APPLICATIONS FOR PROGRESS PAYMENT

.1 Date applications for payment for last day of each month and ensure amount claimed is for value of Work, proportionate to amount of Contract Price, performed and Products delivered to Place of Work by that date.

.2 Submit to Consultant at least ten (10) working days before first Application for Payment, preliminary Schedule of Values for parts of Work, aggregating total amount of Contract Price, to help facilitate Consultant's evaluation of Contractor's Applications for Payment.

.3 Schedule to follow Contractor's breakdown of Applications for Payment. Item number and descriptions to follow outline as designated in Bid Form.

.4 Application for First Progress Payment to include:

.1 Contractor's dated and numbered invoice; indicating project name and areas included,
.2 Contractor's Schedule of Values,
.3 WorkSafeBC Safety Report & Clearance Letter, certificate dated within ten (10) working days of invoice date.

.5 Application for Subsequent Progress Payments up to and including penultimate to include:

.1 Contractor's dated and numbered invoice; indicating project name and areas included,
.2 Contractor's Schedule of Values,
.3 WorkSafeBC Safety Report & Clearance Letter, certificate dated within ten (10) working days of invoice date,
.4 Statutory Declaration: On form acceptable to Consultant, or CCDC 9A (Prime Contractor) or 9B (Subcontractor), which ever is applicable to invoice, as a sworn statement that all accounts for labour, subcontracts, products, construction machinery and equipment, and other indebtedness which may have been incurred by Contractor in performance of Work and for which Owner might in any way be held responsible have been paid in full, except for amounts properly retained as a Holdback or as an identified amount in dispute.

.6 Application for Final Progress Payment to include:

.1 Contractor's dated and numbered invoice; indicating project name and areas included,
.2 Contractor's Schedule of Values,
.3 WorkSafeBC Safety Report & Clearance Letter, certificate dated within ten (10) working days of invoice date,
.4 Statutory Declaration: On form acceptable to Consultant, or CCDC 9A (Prime Contractor) or 9B (Subcontractor), which ever is applicable to invoice, as a sworn statement that all accounts for labour, subcontracts, products, construction machinery and equipment, and other indebtedness which may have been incurred by Contractor in performance of Work and for which Owner might in any way be held responsible have been paid in full, except for amounts properly retained as a Holdback or as an identified amount in dispute.

.1 Statutory Declaration must clearly indicate that it is for Total Performance of Work and subsequent release of Holdback.

END OF SECTION

1.1 GENERAL

1.2 PROJECT COORDINATION

.1 The Contractor is responsible for coordination with other trades. Lines of demarcation between the Contractor's work and trades' work are solely the responsibility of the Contractor. The Consultant assumes no responsibility for division of the work or for any jurisdiction regarding such division.

.2 The Contractor is responsible for coordination with the Owner of all on-site activity as it affects the operation of the building.

1.3 CONSTRUCTION REVIEW

.1 When the project is in progress, the Owner's Representative will provide the following:

- .1 Conduct a pre-project start-up meeting with the Building Owner, Project Manager, and Contractor to ensure that all aspects of the project are understood and are acceptable to all parties concerned.
- .2 Keep the Owner informed as to the progress and quality of the work as observed.
- .3 Shall inspect roof work in progress a minimum of three days per week to ensure full compliance with the specifications. An inspector temporarily employed is not acceptable.
- .4 Shall provide reports showing details for each inspection day, of work undertaken. These details shall include pictures and notes for each stage of the work, including all layers of the built up roof system. This report shall be provided in an electronic format.
- .5 Report to the Owner in writing any failure or refusal of the Contractor to correct unacceptable practices called to the Contractor's attention.
- .6 Confirm after completion that there are no application procedures in conflict with the specifications other than those that may have been previously reported and corrected.

.2 The Owner or his Representative shall have access to the work for the purpose of inspection. The Owner or his Representative may order any extra tests or inspections that may be deemed necessary to ascertain the proper execution of the work. If the work is found in accordance with the Contract, the Owner shall pay the cost of the extra tests or inspections. If the work is found deficient in terms of the Contract, then the Contractor shall pay the costs, including any additional costs to make the work acceptable under the contract.

1.4 PROJECT CONDITIONS

.1 Proceed with roofing work only when existing and forecasted weather conditions will permit unit of work to be installed in accordance with manufacturer's recommendations and warranty requirements.

.2 Do not expose materials vulnerable to water or sun damage in quantities greater than can be weatherproofed during same day.

1.5 SEQUENCING AND SCHEDULING

.1 Sequence installation of modified bituminous sheet roofing with related units of work, to ensure that roof assemblies including roof accessories, flashing, trim and joint sealers are protected against damage from effects of weather, corrosion and adjacent construction activity.

.2 Fully complete all modified bituminous membrane roofing field assembly work each day. Phased application of the membrane plies will not be accepted.

2.0 PRODUCTS

Not applicable.

3.0 EXECUTION

Not applicable.

END OF SECTION

PART 1 - GENERAL

1.1 DESCRIPTION

.1 This section details procedures to be followed for delivery of Submittals identified and required by other specification sections, consisting of but not limited to:

.1 Shop drawings.
.2 Samples.
.3 Mock-ups.
.4 Certificates and transcripts.

1.2 GENERAL REQUIREMENTS

.1 Transmittal for Submissions: Accompany all submittals with transmittal letter containing:

.1 Date of transmittal,
.2 Sequential number for tracking of each submission,
.3 Project title and number,
.4 Identification and quantity of each shop drawing, product data sheet, sample, etc,
.5 Contractor's business name and address,
.6 Name of reviewer for Contractor,
.7 Contractor’s review stamp: completed, dated, and signed certifying submittal has been reviewed, checked, and approved for compliance with Contract documents.

.2 Delivery: Direct submittals identified and required by individual technical sections to Consultant for review, unless otherwise directed in writing:

.1 Attention: Thomas Hekl
Telephone: 604-618-1967
Email: hekl@garlandcanada.com

.2 Attention: Ryan Bowman
Telephone: 604-710-1967
Email: rbowman@garlandcanada.com

.3 Time and Scheduling:

.1 Deliver submittals with reasonable promptness and in orderly sequence to avoid delay in progress of Work.

.2 Allow up to ten (10) working days for Consultant's review of each submission.

.3 Time for review to begin and be noted upon receipt of submittal by Consultant.

.4 No adjustments to Contract Time or Price allowed due to delay in progress of Work caused by review, rejection, and re-submission process.

.4 Deviations from Contract Requirements: Notify Consultant in writing of any deviations from Contract Document requirements and state reasons for said deviations at time of submission:

.1 Contractor is responsible for errors and omissions in submission and is not relieved by Consultant's review.

.2 Contractor is responsible for deviations in submission from requirements of Contract Documents and is not relieved by Consultant's review.

.5 Review Before Delivery: Contractor to:

.1 Review each submittal for completeness and compliance with Contract Documents.

.2 Ensure that necessary requirements have been determined and verified, or will be, and that each submittal has been checked and coordinated with requirements of Work.

.3 Verify co-ordination of field measurements and affected adjacent Work.

.6 Incomplete Submissions:

.1 Entire submission package to be returned to Contractor if deemed incomplete during a preliminary review, for reasons including:

.1 Insufficient number of copies provided,
.2 Transmittal for submission incomplete, missing, or unsigned,
.3 Submittal not stamped, completed, signed, dated, and/or identified to specific project.

.7 Re-submissions:

.1 Use same procedure indicated here and above for re-submission.

.2 Clearly identify each correction or change made to submittal.

.3 Use original submittal number with appended suffix at end to indicate revision number.

.8 Acceptance and Rejection:

.1 Where review by Consultant discovers no errors and omissions or only minor corrections, min. two (2) copies to be returned for fabrication and installation of Work to proceed.

.1 One copy of accepted submission to be retained by Consultant for project record.

.2 If submittals are rejected or require significant modification, noted copies to be returned to Contractor and marked with request for correction and re-submittal.

.1 One copy of rejected submission to be retained by Consultant for project record.

.3 Re-submit corrected submittals using same procedure indicated above and listed in this section. Include required number of copies for subsequent re-submission.

.9 Distribution:

.1 Proceed with Work affected by submittals only after Consultant's review is complete.

.2 Distribute copies of accepted submittals as required. Deliver one copy to Owner or Owner's Representative for project management.

.3 Keep one copy of each reviewed submittal on site during performance of Work.

1.3 ACTION SUBMITTALS

.1 Shop Drawings:

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

.2 Number of Copies: Submit three (3) copies of shop drawings for each requirement identified and requested in technical sections, and as many additional copies as Consultant may reasonably request.

.1 Where shop drawings will not be prepared due to standardized manufacture of product, submit copies of product data sheets or brochures.

.3 Identify and Indicate: Products and materials to be used, methods of construction, attachment or anchorage, erection diagrams, connection diagrams, explanatory notes, and any other information necessary for completion of Work.

.1 Where articles or equipment attach to or connect to other articles or equipment, indicate that such items have been coordinated; regardless of Section under which adjacent items to be supplied and installed. Indicate cross references to design drawings and specifications.

.4 Drawings and Diagrams:

.1 Field Measurements: Note critical dimensions established by field measurement and any relationships to other critical features of Work.

.2 Project specific information and dimensions to be drawn accurately to scale.

.3 Manufacturer's Standard Drawings: Supplement standard information to provide detail specifically applicable to project. Modify to delete information not applicable to project.

.4 Measurements and Units: Present shop drawings, product data, samples, and mock-ups in SI Metric units. Where items or information are not produced in SI Metric units, converted values are acceptable.

.5 Submittals to Include:

.1 Date and revision dates,
.2 Project title and number,
.3 Name and address of Subcontractor, Supplier, and Manufacturer,
.4 Contractor's stamp, signed by authorized representative certifying approval of submissions, verification of field measurements, and compliance with Contract

Documents,

.5 Where required, licensed Engineer's signed and dated stamp or seal, valid for Place of Work,

.6 Details for appropriate portions of Work, as applicable including:

.1 Fabrication,
.2 Dimensioned layouts, including field dimensions and clearances,
.3 Setting or erection details,
.4 Capacities,
.5 Performance characteristics,
.6 Standards,
.7 Operating weight,
.8 Wiring diagrams,
.9 Single line and schematic diagrams,
.10 Relationship to adjacent work.

.6 Changes and Adjustments:

.1 Make noted changes to shop drawings as Consultant may require, consistent with Contract Documents. When re-submitting notify Consultant in writing of any revisions other than those requested.

.2 Adjustments to shop drawings made by Consultant are not intended to change Contract Price. If adjustments affect value of Work, state such in writing to Consultant prior to proceeding with Work.

.2 Samples:

.1 Number of Copies: Submit duplicate (2) samples for each requirement identified and requested in technical sections, and as many additional sample copies as Consultant may reasonably request.

.2 Identify and Indicate: Label sample's source or manufacture, material, size, model number, and intended usage in Work.

.3 Sample Size:

.1 Full size samples, cured and finished, as indicated in technical sections,
.2 Physically identical to product proposed for use in Work,
.3 Prepared from same materials and methods to be used for installation of Work.

.4 Mount, display, or otherwise package samples in sufficient way to facilitate review of sample for quality.

.5 Where colour, pattern, or texture is criterion, submit full range of samples.

.6 Notify Consultant in writing, at time of submission, of any deviations in samples provided from requirements of Contract Documents.

.7 Changes and Adjustments:

.1 Make noted changes to samples as Consultant may require, consistent with Contract Documents.

.2 Adjustments to samples made by Consultant are not intended to change Contract Price. If adjustments affect value of Work, state such in writing to Consultant prior to proceeding with Work.

.8 Do not proceed with any Work associated with samples until each has been reviewed and accepted by Consultant.

.1 Acceptance of samples to be noted in writing by Consultant.

.9 At least one of each accepted sample to be returned to Contractor to store on site.

.10 Reviewed and accepted samples to become standard of workmanship and material referenced for comparison and verification of finished Work.

.3 Mock-ups:

.1 Erect sample mock-ups for each requirement identified and requested in technical sections, and as requested by Consultant.

.2 Mock-ups to be full scale and in section sizes as identified in technical section or as requested by Consultant.

.3 Coordinate location for on site installation of mock-ups with Consultant.

.4 Deliver one submittal letter noting completion of mock-up installation and requesting on site review by Consultant.

.5 Do not proceed with any Work associated with mock-up until it has been reviewed and accepted by Consultant.

.1 Acceptance of mock-ups to be noted in writing by Consultant.

.6 Accepted mock-up to constitute minimum project standard of workmanship and material to be maintained throughout performance of Work.

.7 Maintain and protect mock-ups on site during progress of Work as reference for comparison and verification of finished Work.

.1 Any Work completed after review not meeting mock-up standard to be removed and reinstalled, at Consultant's discretion, with new materials at no additional cost to Owner.

1.4 INFORMATIONAL SUBMITTALS

.1 General:

.1 Number of Copies: Unless otherwise noted, submit three (3) copies for each requirement identified and requested in technical sections, and as many additional copies as Consultant may reasonably request.

.2 Insurance and Bonds: True copies of transcripts for specified insurance and bonds:

.1 Naming Owner and Consultant as extra insured,
.2 Indicating amount and type of coverage,
.3 Notarized and executed.

.4 Contractor's Roof System Certification:

.1 Letter certifying that products and materials specified in Scope of Work for Roofing and its related technical sections:

.1 Are compatible with each other and substrate,
.2 Are approved by membrane manufacturer for application and installation type,
.3 Meet specified warranty and system requirements,
.4 Achieve and meet specified FM wind uplift ratings.

.2 Certification letter to contain:

.1 Contractor's business letterhead,
.2 Name of representative authorized to provide certification,
.3 Stamp, date, and signature of authorized representative.

.5 Manufacturer's Warranty: Full size, true copy of official warranty:

.1 Indicating Manufacturer's name and business address,
.2 With terms and conditions for specified warranty type and coverage period,

.6 Contractor's Warranty: Full size, true copy of official warranty:

.1 On recognized form by provincial roofing association or one approved by Consultant,
.2 Indicating Contractor's name and business address,
.3 With terms and conditions for specified warranty type and coverage period.

.7 Manufacturer's Instructions and Product Data Sheets:

.1 Published or written instructions or information documenting recommended guidelines and installation procedures in accordance with individual specification sections, including:

.1 Manufacturer's Name,
.2 Product name and model number,
.3 Current and latest edition.

.8 Manufacturer's MSDS Data Sheets:

.1 Published or written information documenting physical and chemical characteristics of products to be installed with handling, safety, and first aid guidelines, including:

.1 Manufacturer's Name,
.2 Product name and model number,
.3 Current and latest edition.

.9 Health and Safety Plan for Specific Site:

.1 Submit in accordance with Section 01 35 30 – Health and Safety Requirements.

.10 Certificates: Full size, true copies indicating:

.1 Name and address of Issuing Authority,
.2 Purpose of certificate,
.3 Individual or company covered by issued certificate,
.4 Notarized and executed.

.11 Trade or Installer Qualifications:

.1 Present accreditation cards or tickets, or true copy of, to QA Observer at start of Work and whenever Observer requests, containing:

.1 Name and photo of qualifying individual,
.2 Identification of training type or certification received,
.3 Date achieved or received, or expiry of certification.

.12 Applications for Payment:

.1 One copy by courier, fax, or email with all required accompanying submittals and documentation in accordance with Section 01 29 00 – Payment Procedures.

.13 Closeout Submittals:

.1 Upon completion and acceptance of Work, deliver copies of submittals in accordance with Section 01 77 00 – Closeout Procedures.

PART 2 - PRODUCTS

Not Applicable

PART 3 – EXECUTION

Not Applicable

END OF SECTION

PART 1 - GENERAL

1.1 DESCRIPTION

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

1.2 REFERENCES

.1 Federal regulations, latest edition including all amendments up to project date:

.1 Fire Commissioners of Canada, FC 301, Standard for Construction Operations.
.2 Canada Labour Code, Part 2, Canada Occupational Safety and Health Regulations.

.2 Provincial regulations, latest edition including all amendments up to project date:

.1 Provincial or National Building Code for Place of Work.
.2 Provincial Occupational Health and Safety Act.

1.3 SUBMITTALS

.1 Informational Submittals:

.1 Notice of Project filed with Provincial Ministry of Labour or equivalent for Place of Work.

.2 Health and Safety Plan for Specific Work Site including, but not limited to:

.1 Name and contact info of Contractor's Health and Safety Representative for Work Site; including twenty-four (24) hour emergency contact phone numbers.

.2 Phone numbers of local fire, police, and ambulance outside of 911 services.

.3 Location of nearest medical facility and level of injury that each can service.

.4 Copies of certification for all employees on site of applicable safety training including, but not limited to:

.1 WHIMIS.
.2 Fall arrest and protection.
.3 Suspended Access Equipment.
.4 Erection of Scaffolding.
.5 License for powder actuated devices.

.5 Material Safety Data Sheets (MSDS) of controlled products to be used.

.6 On-site Contingency and Emergency Response Plan addressing:

.1 Standard procedures to be implemented during emergency situations.

.2 Preventative planning and protocols to address possible emergency situations. For example, if swing stage work is required, list protocol to be followed if supporting cable breaks.

.7 Guidelines for handling, storing, and disposing of hazardous materials that may be encountered on site, including measures to prevent damage or injury in case of an accidental spill.

.3 Incident and accident reports, promptly if and upon occurrence.

.4 Make submittals in accordance with Section 01 33 00 - Submittal Procedures.

1.4 RESPONSIBILITY

.1 Contractor responsible for health and safety of persons on Work Site and for protection of persons adjacent to Site to extent that they may be affected by performance of Work.

.2 Contractor responsible for safety of property and environment on Work Site and for protection of same adjacent to Site to extent that they may be affected by performance of Work.

.3 Contractor is responsible for health and safety at Work Site and is not relieved by Consultant's review of Health and Safety Plan for Specific Work Site.

1.5 OCCUPATIONAL HEALTH AND SAFETY

.1 Comply and conform to all health and safety work practices in accordance with regulations and authorities having jurisdiction at Place of Work including, but not limited to:

.1 WHMIS awareness and training.
.2 Fall-arrest, temporary guardrails, and travel-restraint systems.
.3 Eye protection, hardhats, and safety boots.

.2 Maintain one reference copy on site of Occupational Health and Safety Act and Regulations for Construction Projects for Place of Work, latest edition.

.3 Ensure that all personnel are adequately equipped to comply with safety regulations and that sufficient safety equipment is available.

.4 Provide at Work Site sufficient equipment to supply first aid.

.5 Promptly report to Owner and Consultant all accidents, and any claims made against Contractor or Subcontractor on account of accident.

.6 Enforce proper work methods and act immediately on directions regarding safety and work practices given by authorities having jurisdiction or by Owner, at no additional cost to Owner.

.7 Failure of Contractor to comply with verbal or written instructions or orders from Ministry of Labour Inspector, other authorities, Owner, or Consultant regarding safe work practices or provision of specified requirements under regulations to be considered Non-Compliance with Contract.

.1 Owner or Consultant may stop Work for failure to rectify non-compliance of health and safety regulations.

1.6 WORKPLACE HAZARDOUS MATERIALS INFORMATION SYSTEM (WHIMS)

.1 Contractor to be familiar with WHIMIS regulations and be responsible for compliance.

.2 Contractor responsible for all other requirements of regulations as applicable to Employers.

.3 All controlled products to be properly labelled and stored.

.4 Immediately inform Owner and Consultant if any unforeseen or peculiar safety-related factor, hazard, or condition becomes evident during performance of Work.

PART 2 - PRODUCTS

Not Applicable

PART 3 – EXECUTION

Not Applicable

END OF SECTION

PART 1 - GENERAL

1.1 SECTION INCLUDES

.1 Barriers

.2 Environmental Controls

.3 Fall Arrest

.4 Traffic Controls

.5 Fire Routes

1.2 APPLICABLE PUBLICATIONS

.1 Canadian General Standards Board (CGSB)

.1 CGSB 1.189M – Primer, Alkyd, Wood, Exterior

.2 CGSB 1.59 – Alkyd Exterior Gloss Enamel

.2 Canadian Standards Association (CSA)

.1 CSA O121M – Douglas Fir Plywood

.3 Occupational Health and Safety Act and regulations for Construction Projects, 2000 Edition.

.4 Canadian Standards Association (CSA), CSA S350-M, Code of Practice for Safety in Demolition of Structures.

.5 Comply with National Building Code of Canada, Part 8, "Safety Measures at Construction and Demolition Sites", and Provincial requirements.

1.3 INSTALLATION AND REMOVAL

.1 Provide temporary controls in order to execute Work expeditiously.

.2 Remove from site all such work after use.

1.4 WORK AREA HOARDING

.1 Erect temporary site enclosures where required using:

.1 38 x 89 mm (2" x 4") construction grade lumber framing at 600 mm (2') centres and 1200 x 2400 x 13 mm (4' x 8' x 1/2") exterior grade fir plywood to CSA O121. Apply plywood panels vertically flush and butt jointed.

.2 1800 mm (6') high interlocking steel fence, with openings no greater than 38 mm (1.5")

.2 Where required provide a minimum of one lockable truck entrance gate and at least one pedestrian door as directed and conforming to applicable traffic restrictions on adjacent streets.

Equip gates with locks and keys.

.3 Erect and maintain pedestrian walkways including roof and side covers, complete with signs and electrical lighting as required by law.

.4 Paint public side of site enclosure in selected colours with one coat primer to CAN/CGSB 1.189M and one coat exterior paint to CAN/CGSB 1.59. Maintain public side of enclosure in clean condition.

.5 Provide barriers around trees and plants designated to remain. Protect from damage by equipment and construction procedures.

1.5 COVERED HOARDING

.1 Covered hoardings will be required when working over exits that serve as fire exits and locations where entrance or exit is required to remain open during work as stipulated by Owner.

.2 Covered hoardings to be erected from vertical face of exit/entrance a minimum of:

.1 a line from top of work extending on 60^{o} angle from vertical, or

.2 6000 mm (20') long.

.3 Covered hoardings to be provided when work occurs overhead of following:

.1 Emergency exits

.2 Safe Areas

.3 Emergency access roads

.4 Entrances and exits determined by Owner to remain open during work

.5 Entrances and exits required to remain open to provide adequate egress in and out of building

.4 Covered hoardings for pedestrian traffic to be constructed as follows:

.1 Scaffolding frames with X-bracing at 2400 mm (8') o/c;

.2 2x10 planks across top of frames tight together fastened to scaffolding frames;

.3 19 mm (3/4") plywood fastened to top of 2x10 planks;

.4 minimum 12 mm (1/2") plywood on 38 x 89 mm framing side walls set inside of overhead framing;

.5 provide and maintain lighting to a minimum of 50 lux, constructed in a fashion that will mitigate vandalism.

.5 Covered hoardings for Access roads and Safe Areas to be designed by a Professional Engineer licensed in province for Place of Work under guidelines of provincial Occupational Health and Safety Act and with local authorities having jurisdiction.

1.6 WORKING FROM ROOF

.1 If and when work is performed on roof, existing roof composition to be protected by following:

.1 minimum 25 mm (1") rigid insulation;

.2 6 mil polyethylene sheet, lapped at discontinuities by 300 mm (12");

.3 19 mm (3/4") plywood sheathing.

1.7 FALL ARREST

.1 If building does not have an approved roof anchor system in place, supply an engineered rigging system signed and sealed by a Professional Engineer.

.2 Provide rigging drawings showing location of anchors, life lines and primary suspension lines indicating following:

.1 Primary suspension line size.

.2 Life safety line size.

.3 Quantity and location of counter weights.

.4 Size and length of outrigger beam.

.5 Configuration of stages, whether bosuns chair, swing stage or tiered swing stage.

.6 Details indicating:

.1 proprietary beam saddles with anchorage

.2 compression fittings

.3 shackles or forged hooks

.4 protection of life lines

.5 size and quantity of cable clips

.3 Where swing stage rigging is not used prepare plans indicating a location of life line tie offs.

.4 Provide typical details indicating construction and anchorage for secure, rigid guard rails and barricades around deep excavations, open shafts, open stair wells, open edges of floors and roofs.

.5 Conform to requirements of Occupational Health and Safety Act and regulations for Construction Projects

1.8 WEATHER ENCLOSURES

.1 Weather to be considered incidental to work and to not be claimed as additional.

.2 Applicable standard to be used for materials or building components when enclosures and/or heating is required to complete work.

.3 Provide weather tight closures for, but not limited to:

.1 unfinished door and window openings;

.2 openings in floors and roofs;

.3 openings through walls;

.4 locations where daily work is not completed in a days work and components left exposed are sensitive to weather conditions;

.5 protection of materials used that are sensitive to weather conditions.

.4 Design enclosures to withstand wind pressure, snow loading etc.

1.9 DUST TIGHT SCREENS

.1 Provide dust tight screens to localize dust generating activities, and for protection of workers, finished areas of Work and public.

.2 Maintain and relocate protection until such work is complete.

.3 Provide means for ventilating area if work is to occur in an interior or confined space.

.4 Ventilate work area when it corresponds with areas used by tenants or patrons concurrently for parking or egress. If dust generation will affect tenants or patrons provide sealed enclosure with adequate ventilation for health and safety of workers.

1.10 ACCESS TO SITE

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

.2 Provide all appropriate signage directing public and building occupants away from work area

.3 Emergency exits: Maintain clear and unobstructed use of all existing exit doors and routes. This may include provision of overhead protection and enclosed exit walkways in case of overhead work. Provide adequate lighting for 24 hour use.

1.11 PUBLIC TRAFFIC FLOW

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

1.12 FIRE ROUTES

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

vehicles.

.2 Provide all required signage to inform emergency vehicles of temporary route for access if modified as part of work.

1.13 PROTECTION FOR OFF-SITE AND PUBLIC PROPERTY

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

.2 Be responsible for damage incurred.

1.14 PROTECTION OF BUILDING FINISHES

.1 Provide protection for finished and partially finished building finishes and equipment during performance of Work.

.2 Provide necessary screens, covers, and hoardings.

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

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

PART 2 - PRODUCTS

Not Applicable

PART 3 – EXECUTION

Not Applicable

END OF SECTION

1.1 GENERAL

1.2 MANUFACTURER'S INSTRUCTIONS

.1 Unless otherwise specified, comply with the manufacturer's latest printed instructions for materials and installation methods.

1.3 DELIVERY, STORAGE AND HANDLING

.1 Deliver, store and maintain packaged materials with the manufacturer's seals and labels intact, dry and undamaged.

.2 Store and handle roofing sheets in a dry, well-ventilated, weather-tight place to ensure no possibility of significant moisture exposure. Store rolls of felt and other sheet materials on pallets or other raised surface on end.

.3 Immediately remove rejected materials from the Place of Work.

.4 Storage and handling of materials shall conform to the Workers' Compensation Board of British Columbia Regulations and the manufacturer's instructions.

.5 It is the responsibility of the contractor to secure all material and equipment on the job site. If any material or equipment is stored on the roof, the contractor must make sure that the integrity of the deck is not compromised at any time.

.6 All containers to be labelled in accordance with WHMIS regulations.

.7 Provide Material Safety Data Sheets (MSDS) if requested.

2.1 PRODUCTS

2.2 MATERIALS

.1 Use new products unless otherwise specified.

3.0 EXECUTION

Not applicable.

END OF SECTION

1.1 GENERAL

1.2 WORK INCLUDED

.1 Conduct all cleaning and disposal operations during the work.

1.3 REFERENCES

.1 Waste Control Regulation – British Columbia Environmental Protection and Enhancement Act. (British Columbia Occupational Health and Safety).

2.1 PRODUCTS

2.2 MATERIALS AND EQUIPMENT

.1 Use only cleaning materials and equipment approved by the manufacturer of the surface to be cleaned, and only as recommended by the cleaning material manufacturer.

3.1 EXECUTION

3.2 WASTE REMOVAL AND CLEANING DURING CONSTRUCTION

.1 Maintain the Place of Work and adjacent public properties free from accumulations of waste materials and rubbish.

.2 Separate and recycle all recoverable waste materials.

.3 All wastes that create hazardous conditions must be removed from the premises daily.

.4 Disposal of all waste products to be performed in strict accordance with the product manufacturer's Material Safety Data Sheet, and in accordance with the provincial Waste Control Regulations.

.5 Drainage system nor sump pits shall not be used to dispose of project wastes and materials.

END OF SECTION

PART 1 - GENERAL

1.1 SECTION INCLUDES

.1 Consideration of Substantial Performance

.2 Review and QA Observations required for applications of Substantial Performance and Total Completion

.3 Closeout Submittals

1.2 REFERENCES

.1 Canadian Construction Documents Committee (CCDC)

.1 CCDC 2 – 2020, Stipulated Price Contract.

1.3 CONSIDERATION OF SUBSTANTIAL PERFORMANCE AND COMPLETION BY CONSULTANT

.1 A contract will be considered substantially performed given following:

.1 when improvement to be made under that contract is capable of completion or, where there is a known defect, correction, at a cost of not more than,

.1 3 percent of first $500,000 of Contract Price,

.2 2 percent of next $500,000 of Contract Price, and

.3 1 percent of balance of Contract Price.

.2 Where work cannot be completed expeditiously for reasons beyond control of Owner or Contractor, remaining costs will be deleted from Contract Price in determination of substantial performance.

.2 A contract will be considered completed given following:

.1 when improvement to be made under that contract is capable of completion or, where there is a known defect, correction, at a cost of lesser of,

.1 1 percent of Contract Price.

.2 $1,000.00

PART 2 - PRODUCTS

Not Applicable

PART 3 - EXECUTION

3.1 EXAMINATION AND DECLARATION

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

.2 Consultant will schedule date within time allowance of Contract documents for both Consultant and Contractor to perform review of Work and to confirm Work identified on submitted list.

.3 Consultant will within time allowance of Contract documents provide a breakdown of costs associated with deficiencies and defects for Consideration of Substantial Performance.

.4 If Work is deemed incomplete in Consideration of Substantial Performance, complete outstanding items and request additional review following same protocol.

.5 When Contractor is satisfied that Work is completed make application for final review by Consultant. Consultant will within allowances of Contract documents perform final review of Work.

.6 Any deficiencies and defects to be tabulated with associated costing for Consideration of Completion.

.7 If Work is deemed incomplete by Consultant, complete outstanding items and request additional review.

.8 Defective products will be rejected, regardless of previous review and observations. Replace products with new at no expense to Owner.

3.2 MAINTENANCE AND RECORD DOCUMENTS

.1 Following to be submitted to Owner at completion of Work:

.1 Maintenance manuals for, but not limited to, operating instructions, maintenance manuals, record of “as built” drawings, spare parts, maintenance of materials, special tools for completeness.

.2 Record of substantial and project completion correspondence inclusive, but not limited to Contractor lists, Consultant tabulations and certificates.

.3 Compile all shop drawings that have been submitted.

3.3 RECORDING ACTUAL SITE CONDITIONS

.1 Submit Actual Conditions as outlined in following sentences.

.2 Record information on set of Project Specifications provided by Consultant.

.3 Provide felt tip marking pens, maintaining separate colours for each major system, for recording information.

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

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

.1 Measured horizontal and vertical locations of underground utilities and appurtenances, referenced to permanent surface improvements.

.2 Measured locations of internal utilities and appurtenances, referenced to visible and accessible features of construction.

.3 Field changes of dimension and detail.

.4 Changes made by change orders.

.5 Details not on original Contract Drawings.

.6 References to related shop drawings and modifications.

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

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

.2 Changes made by Addenda and change orders.

3.4 WARRANTIES AND BONDS

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

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

.3 Obtain warranties and bonds, executed in duplicate by subcontractors, suppliers, and manufacturers, within ten days after certification of completion.

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

.5 Co-execute submittals when required.

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

3.5 FORMAT

.1 Organize data in form of an instructional manual.

.1 Binders to be vinyl, hard covered, 3 'D' ring, loose leaf [219 x 279] mm with spine and face pockets.

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

.3 Identify each binder with type or printed title 'Project Record Documents'; list title of project and identify subject matter of contents.

.4 Arrange content under Section numbers and sequence of Table of Contents.

.5 Provide tabbed fly leaf for each separate product and system, with typed description of product and major component parts of equipment.

.6 Manufacturer's printed data, or typewritten data will be accepted.

.7 Drawings to be provided with reinforced punched binder tab. Bind in with text; fold larger drawings to size of text pages.

3.6 CONTRACT CLOSE-OUT

.1 Expedite and complete deficiencies and defects identified by Consultants.

.2 Submit required documentation such as statutory declarations, Workers' Compensation Certificates, warranties, certificates of approval or acceptance from regulating bodies.

.3 Review QA Observation and testing reports to verify conformance to intent of documents and that changes, repairs or replacements have been completed.

.4 Provide on-going review, examination and attendance to building, call-back, maintenance and repair problems during Warranty periods.

.5 Provide warranties and bonds fully executed and notarized.

.6 Execute transition of Performance of Labour and Materials Payment Bond to warranty period requirements.

.7 Collect and assemble documents executed by Subcontractors, suppliers and manufacturers.

END OF SECTION

PART 1 - GENERAL

1.1 RELATED SECTIONS

.1 Section 01 11 00 – Summary of Work

.2 Section 01 56 00 – Temporary Barriers and Enclosures

.3 Section 07 31 13.13 - Fiberglass-Reinforced Asphalt Shingles

.4 Section 07 52 16.11 – Cold Adhesive Modified Bituminous Membrane Roofing

.5 Section 07 55 52 – Torch-Applied Modified Bituminous Protected Membrane Roofing

1.2 APPLICABLE PUBLICATIONS

.1 Most recent revision of following:

.1 Canadian Standards Association CSA S350, Code of Practice for Safety in Demolition of Structures.

.2 National Building Code of Canada, Part 8, "Safety Measures at Construction and Demolition Sites", and Provincial requirements.

.3 Occupational Health and Safety Act and regulations for Construction Projects.

.4 Canadian Environmental Protection Act (CEPA), 1988.

.5 Canadian Environmental Assessment Act (CEAA), 1995.

.6 Transportation of Dangerous Goods Act (TDGA), 1992.

1.3 ASBESTOS AND DESIGNATED SUBSTANCES

.1 Demolition of spray or trowel applied asbestos can be hazardous to health. Notify Consultant if material resembling spray or trowel-applied asbestos is encountered on site. Stop work and do not proceed with removals until written instructions have been received from Consultant.

1.4 STORAGE AND PROTECTION

.1 Protect existing items designated to remain and items designated for salvage. In event of damage to such items, immediately replace or make repairs to approval of Consultant and at no cost to Owner.

.2 In all circumstances, ensure that demolition work does not adversely affect adjacent watercourses, groundwater and wildlife, or contribute to excess air and noise pollution.

.3 Protect trees, plants and foliage on site and adjacent properties where indicated.

1.5 EXISTING CONDITIONS

.1 Prior to start of any demolition work, remove contaminated or hazardous materials from site and

dispose of at designated disposal facilities.

.2 Record and discuss with Consultant any deviations from existing assumed conditions as indicated by drawings and/or specifications.

1.6 REGULATORY REQUIREMENTS

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

1.7 NOTICE

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

PART 2 - PRODUCTS

Not Applicable

PART 3 - EXECUTION

3.1 PREPARATION

.1 Examine site with Consultant and verify extent and location of items designated for removal, disposal, recycling, salvage and items to remain.

.2 Locate and protect utilities where applicable. Notify and obtain approval of utility companies before starting demolition.

3.2 GENERAL PROTECTION

.1 Prevent movement, settlement, or other damage to adjacent structures, utilities, and parts of building to remain in place. Provide engineered bracing and shoring as required.

.2 Minimize noise, dust, and inconvenience to occupants.

.3 Protect existing building systems, services and equipment.

.4 Provide temporary dust screens, covers, railings, supports and other protection as required.

.5 Provide required signage, barricades, hoarding, overhead protection and temporary egress.

.6 Support affected structure or building components and if safety of structure being demolished or adjacent structures or services appears to be endangered, take preventative measures and then cease operations and notify Consultant immediately.

.7 Ensure that demolition work does not adversely affect adjacent watercourses, groundwater and wildlife, or contribute to excess air and noise pollution.

.8 Do not dispose of waste or volatile materials such as: mineral spirits, oil, petroleum based lubricants, or toxic cleaning solutions into watercourses, storm or sanitary sewers. Ensure proper disposal procedures are maintained throughout project.

.9 Do not pump water containing suspended materials into watercourses, storm or sanitary sewers, or onto adjacent properties.

.10 Control disposal or runoff of water containing suspended materials or other harmful substances in accordance with local authorities.

.11 Prevent extraneous materials from contaminating air beyond application area, by providing temporary enclosures during demolition work.

.12 Cover or wet down dry materials and waste to prevent blowing dust and debris. Control dust on all temporary roads.

3.3 DEMOLITION SALVAGE AND DISPOSAL

.1 Remove parts of existing structure or roof system to permit repairs or new installation. Sort materials into appropriate piles for recycling and or reuse.

.2 Refer to drawings and specifications for items identified for reuse or salvage, if applicable.

.3 Remove items to be reused, store in a protected location, and reinstall under appropriate section of specification.

.4 Trim edges of partially demolished building elements to suit future use.

.5 Include for disposal of removed materials to appropriate Landfill and/or recycling facilities, except where specified otherwise, and in accordance with authority having jurisdiction.

.6 Dispose of debris on a continuous basis. Do not stockpile debris in a manner which would overload structure, or impede access around site.

3.4 SEQUENCE OF OPERATION

.1 Removal:

.1 Remove items as indicated. Do not disturb items designated to remain in place.

.2 Removal From Site:

.1 Interim removal of stockpiled material may be required, if it is deemed to interfere with operations of Owner.

.3 Salvage:

.1 Carefully dismantle items containing materials for salvage and stockpile salvaged materials at locations acceptable to Owner and Consultant.

.4 Disposal of Material:

.1 Dispose of materials not designated for salvage or reuse on site to be hauled to an authorized disposal site and or recycling facilities.

.5 Backfill:

.1 Backfill in areas as indicated.

3.5 RESTORATION

.1 Restore areas and existing works outside areas of demolition to match condition of adjacent, undisturbed areas.

.2 Use only soil treatments and procedures which are not harmful to health, are not injurious to plants, and do not endanger wildlife, adjacent water courses or ground water.

3.6 CLEANUP

.1 Upon completion of work, remove debris, trim surfaces and leave work site clean.

.2 Use only cleaning solutions and procedures which are not harmful to health, are not injurious to plants, and do not endanger wildlife, adjacent water courses or ground water.

END OF SECTION

PART 1 GENERAL

1.1 RELATED SECTIONS

.1 Section 07 31 13.13 - Fiberglass-Reinforced Asphalt Shingles

.2 Section 07 52 16.11 – Cold Adhesive Modified Bituminous Membrane Roofing

.3 Section 07 52 16.13 – Torch-Applied Modified Bituminous Membrane Roofing

.4 Section 07 55 52 – Torch-Applied Modified Bituminous Protected Membrane Roofing

.5 Section 07 62 00 – Sheet Metal Flashing and Trim

1.2 REFERENCES

.1 American Society for Testing and Materials (ASTM)

.1 ASTM A123/A123M, Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products.

.2 ASTM A653/A653M, Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvanealled) by the Hot-Dip Process.

.3 ASTM C578, Specification for Rigid, Cellular Polystyrene Thermal Insulation.

.4 ASTM C1396/C1396M, Standard Specification for Gypsum Board.

.5 ASTM D5055, Specification for Establishing and Monitoring Structural Capacities of Prefabricated Wood I-Joists.

.2 Canadian General Standards Board (CGSB)

.1 CAN/CGSB-51.32, Sheathing, Membrane, Breather Type.

.2 CAN/CGSB-51.34, Vapour Barrier, Polyethylene Sheet for Use in Building Construction.

.3 CAN/CGSB-71.26, Adhesive for Field-Gluing Plywood to Lumber Framing for Floor Systems.

.3 Canadian Standards Association (CSA)

.1 CSA A123.2, Asphalt Coated Roofing Sheets.

.2 CAN/CSA-A247, Insulating Fiberboard.

.3 CSA B111, Wire Nails, Spikes and Staples.

.4 CSA 0112.9, Evaluation of Adhesives for Structural Wood Products (Exterior Exposure).

.5 CSA O121, Douglas Fir Plywood.

.6 CAN/CSA-O141, Softwood Lumber.

.7 CSA O151, Canadian Softwood Plywood.

.8 CAN/CSA-O325.0, Construction Sheathing.

.4 National Lumber Grades Authority (NLGA)

.1 Standard Grading Rules for Canadian Lumber.

1.3 QUALITY ASSURANCE

.1 Lumber identification: by grade stamp of an agency certified by Canadian Lumber Standards Accreditation Board.

.2 Plywood, particleboard, OSB and wood based composite panels in accordance with CSA and ANSI standards.

PART 2 PRODUCTS

2.1 FRAMING AND LUMBER MATERIALS

.1 Lumber: unless specified otherwise, softwood, No. 1 or No. 2 grade, S4S, moisture content 19% (S-dry) or less in accordance with following standards:

.1 CAN/CSA-O141.

.2 NLGA Standard Grading Rules for Canadian Lumber.

.2 Framing and board lumber: in accordance with NBC.

.3 Furring, blocking, nailing strips, grounds, rough bucks, fascia backing and sleepers:

.1 Board sizes: "Standard" or better grade.

.2 Dimension sizes: "Standard" light framing or better grade.

.3 Post and timbers sizes: "Standard" or better grade.

.4 Pressure treated material to be Alkaline Copper Quaternary (ACQ).

2.2 PANEL MATERIALS

.1 Plywood, OSB and wood based composite panels: to CAN/CSA-O325.0.

.2 Douglas fir plywood (DFP): to CSA O121, standard construction.

.3 Canadian softwood plywood (CSP): to CSA O151, standard construction.

.4 Insulating fiberboard sheathing: to CAN/CSA-A247.

.5 Gypsum sheathing: to 09 21 16 – Gypsum Board Assemblies.

2.3 ACCESSORIES

.1 General purpose adhesive: to CSA O112.9.

.2 Nails, spikes and staples: to CSA B111.

.3 Bolts: 12.5 mm diameter unless indicated otherwise, complete with nuts and washers.

.4 Proprietary fasteners: toggle bolts, expansion shields and lag bolts, screws and lead or inorganic fibre plugs, explosive actuated fastening devices, recommended for purpose by manufacturer.

2.4 FASTENER FINISHES

.1 Galvanizing: to ASTM A123/A123M, ASTM A653, use galvanized fasteners for exterior work, interior highly humid areas and fire-retardant treated lumber.

PART 3 EXECUTION

3.1 INSTALLATION

.1 Comply with requirements of NBC latest edition, Part 9 supplemented by following paragraphs.

.2 Install members true to line, levels and elevations, square and plumb.

.3 Construct continuous members from pieces of longest practical length.

.4 Install spanning members with "crown-edge" up.

.5 Select exposed framing for appearance. Install lumber and panel materials so that grade-marks and other defacing marks are concealed or are removed by sanding where materials are left exposed.

.6 Install wall sheathing in accordance with manufacturer's printed instructions.

.7 Install roof sheathing in accordance with requirements of NBC.

.8 Install furring and blocking as required to space-out and support facings, fascia, and other work as required.

.9 Install furring to support siding applied vertically where there is no blocking and where sheathing is not suitable for direct nailing.

.1 Align and plumb faces of furring and blocking to tolerance of 1:600.

.10 Install rough bucks, nailers and linings to rough openings as required to provide backing for frames and other work.

.11 Install wood cants, fascia backing, nailers, curbs and other wood supports as required and secure using galvanized steel fasteners. Coordinate height of roof curbs with Division 7 Sections.

.12 Use dust collectors and high quality respirator masks when cutting or sanding wood panels.

3.2 ERECTION

.1 Frame, anchor, fasten, tie and brace members to provide necessary strength and rigidity.

.2 Countersink bolts where necessary to provide clearance for other work.

.3 Use nailing disks for soft sheathing as recommended by sheathing manufacturer.

END OF SECTION

1.1 GENERAL

1.2 WORK INCLUDED

.1 Fully adhered SBS modified bituminous membrane roofing over prepared substrate.

1.3 RELATED WORK

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

1.4 REFERENCE STANDARDS

.1 All Reference Standards are latest editions, unless noted otherwise.

.2 CSA A123.3-M1979 (R1992). Asphalt or Tar Saturated Roofing Felt.

.3 CSA A123.4-M1979 (R1992). Bitumen for Use in Construction of Built-Up Roof Coverings and damp proofing and Waterproofing Systems.

.4 CAN/CSA-A247-M86. Insulating Fiberboard.

.5 CAN/CGSB-51.26-M86. Thermal Insulation Faced Polyisocyanurate

.6 CAN/CGSB-37.5-M89. Cutback Asphalt Plastic Cement.

.7 CGSB 37-GP-9Ma-83. Primer, Asphalt, Unfilled, for Asphalt Roofing, Damp proofing and Waterproofing.

.8 CAN/CGSB-37.29-M89. Rubber-Asphalt Sealing Compound.

.9 CGSB 37-GP-56M. Membrane, Modified, Bituminous, Prefabricated, and Reinforced for Roofing.

.10 CAN/CGSB-51.33-M89. Vapour Barrier Sheet, Excluding Polyethylene, for Use in Building Construction.

.11 ASTM D1863, Specification for Mineral Aggregate Used as a Protective Coating for Roofing.

.12 ASTM D2824, Specification for Aluminum-Pigmented Asphalt Roof Coating.

.13 ASTM D5147, Test Method for Sampling and Testing Modified Bituminous Sheet Materials.

.14 ASTM D6162, Specification for Styrene Butadiene Styrene (SBS) Modified Bituminous Sheet Materials Using a Combination of Polyester and Glass Fiber Reinforcements.

.15 ASTM D6163, Specification for Styrene Butadiene Styrene (SBS) Modified

Bituminous Sheet Materials Using Glass Fiber Reinforcements.

.16 Canadian Roofing Contractors Association (CRCA). Roofing Specification Manual.

.17 Roofing Contractors Association of British Columbia (RCABC). RGC Roofing Practices Manual.

1.5 SUBMITTALS

.1 Product Data: Provide data on material characteristics, performance criteria, limitations, and material samples.

.2 Submit copies of MSDS sheets on all products utilized.

.3 Submit test reports, prepared by an independent testing agency, for all modified bituminous sheet roofing, indicating compliance with CGSB 37-GP-56M or ASTM D5147, and that the materials meet the specified performance requirements.

.4 Submit inspection reports, for application compliance.

1.6 QUALIFICATIONS

.1 Company specializing in modified bituminous roofing installation with a minimum 5 years' experience and authorized by roofing system manufacturer as qualified to install manufacturer's roofing materials. Installer must be a member of the Roofing Contractors Association of British Columbia, and be in good standing as of 2017.

.2 Maintain a full-time Supervisor/Foreman on job site during all phases of roofing work and at any time roofing work is in progress. Maintain proper supervision of workmen. Maintain a copy of the specifications in the possession of the Supervisor/Foremen and on the roof at all times.

.3 Immediately correct roof leakage during construction. If the Contractor does not respond within twenty four (24) hours, the Owner has the right to hire a qualified contractor and backcharge the original contractor.

1.7 PRECAUTIONS

.1 Proceed with roofing work only when existing and forecasted weather conditions will permit unit of work to be installed in accordance with manufacturer's recommendations and warranty requirements.

.2 Do not expose materials vulnerable to water or sun damage in quantities greater than can be weatherproofed during same day.

.3 Roofing application shall not be carried out when materials are damp. Apply each part of roofing system only when surfaces are clean and dry.

.4 All adjacent parts of the building shall be protected from damage caused by roofing

operations. Cover walls and other surfaces in the vicinity of hoisting apparatus with heavy canvas or other suitable protective material. Any damage caused under this contract shall be repaired to match the original materials and appearance.

.5 Locate equipment and materials well away from building in areas designated by the Owner.

.6 Conduct operations so as to leave deck exposed for minimum period of time. Protect, as required, to prevent water infiltration to building interior.

.7 Where work must continue over finished roofing membrane, protect surface with minimum 12.5 mm thick plywood sheets.

.8 Fire Extinguishers: Maintain at least one fully-charged fire extinguisher with shutoff nozzle, ULC labelled for A, B and C class per torch applicator, within 10 m of each torch applicator. Strictly adhere to all safety guidelines for the torching of modified bituminous membrane.

.9 Any sharp projections that may puncture the membrane shall be grounded smooth and flush.

.10 Fully complete all modified bituminous membrane roofing field assembly work each day. Phased application of the membrane plies will not be accepted.

1.8 DELIVERY, STORAGE AND HANDLING

.1 Deliver, store and maintain packaged materials with the manufacturer's seals and labels intact, dry and undamaged.

.2 Store and handle roofing sheets in a dry, well-ventilated, weather-tight place to ensure no possibility of significant moisture exposure. Store rolls of felt and other sheet materials on pallets or other raised surface on end.

.3 Immediately remove rejected materials from the Place of Work.

.4 Storage and handling of materials shall conform to the Workers' Compensation Board of British Columbia Regulations and the manufacturer's instructions.

.5 It is the responsibility of the contractor to secure all material and equipment on the job site. If any material or equipment is stored on the roof, the contractor must make sure that the integrity of the deck is not compromised at any time.

.6 All containers to be labelled in accordance with WHMIS regulations.

.7 Provide Material Safety Data Sheets (MSDS) if requested.

1.9 COMPATIBILITY

.1 Compatibility between all components of roofing system is essential.

.2 The Contractor shall be responsible for ensuring that all items elected for use are compatible with each other.

.3 Ensure compliance with RGC warranty standards and manufacturers installation recommendations.

1.10 STANDARDS

.1 In the event that the drawings and specifications differ from the manufacturer's printed instruction, to such a degree that the specified warranties may be affected, consult the Owners representative for instructions.

1.11 INSPECTIONS

.1 When the project is in progress, the Owner's Representative will provide the following:

.1 Keep the Owner informed as to the progress and quality of the work as observed.
.2 Provide daily job site inspections during the roof assembly application.
.3 Report to the Owner in writing any failure or refusal of the Contractor to correct unacceptable practices called to the Contractor's attention.
.4 Confirm after completion that there are no application procedures in conflict with the specifications other than those that may have been previously reported and corrected.

1.12 WARRANTY

.1 Upon completion of installation, and acceptance by the Owner, the roofing Contractor shall issue a 5 year workmanship warranty for the modified bitumen membrane roof system on Contractor letterhead, signed, authorized and executed. In event any work related to roofing, flashing, or metal is found to be within Contractor's warranty term, defective or otherwise not in accordance with Contract Documents, Contractor to repair that defect at no cost to Owner.

.2 The roofing membrane manufacturer shall issue to the Building Owner a twenty (30) year, non-prorated, leak-free guarantee including workmanship and materials for the modified bitumen roof system.

2.1 PRODUCTS

2.2 ACCEPTABLE PRODUCTS

.1 When a particular trade name or performance standard is specified it shall be indicative of a standard required.

.2 Any item or materials submitted as an alternate to the specified products must comply in all respects as to the quality and performance. The Owner shall be the sole judge as to whether or not an item submitted as an equal is truly equal. Should the contractor

choose to submit on the equal basis, he shall assume all risk involved, monetary or otherwise should the Owner find it unacceptable.

.3 Requests for approval must reach the Owners representative at least seven (7) business days prior to the bid closing. The Owners representative shall advise applicants of the status of their request three (3) business days prior to bid closing.

.4 Request for approval must be submitted by bidding contractors only, and shall include:

.1 Project name and number.
.2 Specification sections to which the product/system applied.
.3 Description of proposed substitution including manufacturer's material specifications, manufacturer's preparation and application requirements, manufacturer's inspection intervals, and manufacturer's warranties.
.4 Sample product indicating surface finish and material thickness to be applied under Contract.
.5 Independent test reports indicating compliance with specified product performance levels.
.6 Installation history of proposed alternative including:
.1 Projects and locations
.2 Approximate value of contract
.3 Approximate size of projects
.4 Number of years in use
.5 Type of usage
.6 Name of Owner and Consultant involved

.5 When submitting alternatives to materials or equipment specified, Bidders shall include in their Bid any changes in the work required to accommodate such alternatives. A later claim for addition to the Contract Price because of changes in the work necessitated by the use of alternatives will not be considered.

.6 An addendum will be issued prior to bid closing if an alternative is approved. No alternative materials or equipment will be considered after bid closing.

2.3 DESCRIPTION

.1 All labour, material, equipment and services to supply and install a two ply fully adhered roofing system as specified herein including but not limited to:

.1 Gravel surface embedded in adhesive.
.2 One ply of SBS cap sheet fully adhered in adhesive.
.3 One ply of SBS base sheet fully adhered in adhesive.
.4 Overlay board adhered to substrate.
.5 Wood blocking, as required.
.6 Associated roof flashing and sheet metal.

.2 Scope of Work:

.1 Remove existing 2 ply SBS membrane to the insulation. Leave the existing insulation. Replace the wet fiberboard and ISO.

.2 Install 1 layer of 1/4" Securock in insulation adhesives. Fully adhere to manufacturers specifications. Immediately step on each board after placement into cold adhesive to ensure full adhesion and tightly brace and stagger all insulation seams.

.3 Tape all seams.

.4 Install new cant strips around perimeter and projections.

.5 Sump all drains a minimum 4' x 4' area. Install extra layer(s) of Securock in low areas to ensure water does not pond. Install slopped ISO insulation into the sumped drain areas.

.6 Build up all perimeters to RCABC standards and install overflows to BC Building Code.

.7 Install SBS base sheet in cold adhesives at a rate of 2.5 gal per square. Ensure adequate bleed-out at all seams and complete adhesion throughout all plies of membrane. Do not walk on plies during installation, push and broom in from side of roll. Cold adhesives at a rate of 2.5 gal per square is not to be applied more than 5 feet in front of roll being installed. All plies to extend 2" above cant strips at perimeter and projections.

.8 Unroll SBS modified cap sheet and allow it to relax in the sunshine before installation. Over the entire field, install one ply of SBS modified membrane in cold adhesives at a rate of 2.5 gal per square. Ensure adequate bleed-out at all seams and complete adhesion throughout membrane. Broom over exposed side seam during installation to ensure full adhesion. Cold adhesives at a rate of 2.5 gal per square not to be applied more than 5 feet in front of roll being installed. Modified membrane is to extend 2" above cant strips at perimeter and projections.

.9 Water based primer is required at all penetrations, and around perimeter. Install base SBS modified flashing ply in cold adhesives at a rate of 2.5 gal per square. Base flashing ply to extend minimum 4" beyond top of cant strip, and 4" onto field of roof beyond cant strip. Then install ply of SBS modified membrane cap flashing in cold adhesives. Cap flashing ply to extend over top of wood blocking and 8" onto field of roof beyond cant strip. Cap flashing ply to be nailed into outer edge of perimeter wood blocking (nailed every 6" O.C.), or secured with termination bar (fasteners every 6" O.C.) and cold applied mastic at top of vertical wall flashings.

.10 Reinforce all vertical seams of modified flashings with three courses of fibered mastic and fiberglass mesh.

.11 Install new metal counter flashings and coping caps. All metal must be done in 24 gauge to minimum RCABC standard with proper slope towards the inside and match existing colour

.12 Install water cut-offs at end of day's work.

.13 Fill base of pitch pockets with quick-set grout and top off with two part urethane pitch pocket sealant.

.14 Phased roofing not permitted. Roof should be completed to cap sheet and tied into adjacent areas at the end of each day's production.

.15 Clean entire project of debris and remove all equipment.

.16 Let the system cure for 4 weeks period

.17 Flood the roof with cold adhesive at rate of 4-5 gallons per square and apply 500 lb of gravel.

2.4 ROOFING ASSEMBLY MATERIALS

.1 Base Sheet: One (1) ply SBS (Styrene-Butadiene-Styrene) SBS rubber modified base sheet that utilizes KEVLAR® fibers and a dual polyester and fiberglass combination reinforcement membrane. ASTM D6163, Type III, ASTM D5147 at 23°C Tensile MD/CMD 39 kN/m, Tear MD/CMD 1335 N, Elongation MD/CMD 7.0%, Low

Temp Flex: Passes -30°C.

.2 Cap Sheet: One (1) ply SBS (Styrene-Butylene-Styrene) fiberglass reinforced membrane. ASTM D6163, Type III, ASTM D5147 at 23°C Tensile MD/CMD 38.5 kN/m, Tear MD/CMD 1335 N, Elongation MD/CMD 2.5%, Low Temp Flex: Pass.

.3 Gypsum Insulation Overlay Board: DensDeck Prime 6.35mm (0.25") water-resistant treated gypsum board manufactured with an embedded non-structural fiberglass mat facer and a water-resistant treated core. To include treated surface to improve bonding.

.4 Membrane/Surfacing Adhesive: Cold process modified adhesive for membrane installation and surfacing adhesive.

.5 Screws, Bolts, Nails and Fasteners: Non-ferrous metal or galvanized steel compatible with adjacent surfaces, except that hard copper nails shall be used with copper; aluminum or stainless steel nails shall be used with aluminum; and stainless steel nails shall be used with stainless steel. All fasteners must conform to the RGC Guarantee Standards. Fasteners in contact with pressure treated wood must be 304 or 316 stainless steel.

.6 Cant Strip: Continuous triangular cross section to eliminate 90° membrane transitions at perimeter and curbs, sleeper, etc.

.7 Mastic Compound: V.O.C. compliant, ASTM D2822, Type II. Trowel grade fibered mastic.

.8 Fiberglass Scrim: SBR coated reinforced fiberglass reinforcement scrim meeting ASTM D-1668-86 Type III.

.9 Caulking Compound: One part, non-sag sealant with the following characteristics;

.1	Tensile Strength (ASTM D412)	250 psi
.2	Elongation (ASM D412)	950%
.3	Hardness, Shore A (ASTM C920)	35
.4	Adhesion-in-Peel (ASTM C920)	30 pli

.10 Non-Shrink Grout: Use an all-weather fast setting chemical action concrete material to fill pitch pans.

1.	Flexural Strength (ASTM C-78 (modified))	7 days 1100psi
2.	High Strength (ASTM C-109 (modified))	24 days 8400lbs (3810kg)

.11 Pitch Pocket Sealer: Two part, 100% solids, self-leveling, polyurethane sealant for filling pitch pans as recommended and furnished by the membrane manufacturer.

1.	Durometer (ASTM D2240)	40-50 Shore
2.	Elongation (ASTM D 412)	250%
3.	Tensile Strength (ASTM D 412)	200 @ 100 mil

.12 Vents and Breathers: Heavy gauge aluminum and fully insulated vent that allows moisture and air to escape but not enter the roof system as recommended by the membrane manufacturer.

.13 Roof Drains: Retrofit clamp-tite drain with u-flow seal and aluminum dome strainer.

.14 Pitch pans, Rain Collar 24 gauge stainless or 20oz (567gram) copper. All joints should be welded/soldered watertight. See details for design.

.15 Plumbing stacks should be spun aluminum meeting CSA Standard B79 with vandal-proof caps.

.16 Sheet Metal Flashings: 24 gauge completed in accordance with accepted RGC Guarantee Standards and drawings conforming to ASTM A653 / A653M-06 CS Type B, Z275 (G90) coating. Colour to be chosen by owner.

.17 Insulation Adhesive: 2 part adhesive compatible for use with substrate and insulation types specified, as recommended by the manufacturer.

.18 Liquid Flashing: Shall be composed of polyester fleece reinforcement encapsulated with a polymethel methacrylate (PMMA) resin.

.19 Concrete Pavers: 24" x 24" x 2" approximate concrete paving slabs conforming to CSA A231.2-06 (R2010).

3.0 EXECUTION

3.1 EXAMINATION

.1 Verify that surfaces and project conditions are ready to receive work of this section.

.2 Verify that deck is supported and secured to structural members.

.3 Verify that the surface is clean and smooth, free of depressions, projections or ripples, and is properly sloped to valleys and drains.

.4 Verify that the substrate is dry and free of snow or ice.

.5 Verify that openings, curbs, pipes, conduit, sleeves, ducts, and other items which penetrate the roof are set solidly, and that cant strips, nailing strips and reglets are set in place.

3.2 GENERAL INSTALLATION REQUIREMENTS

.1 Cooperate with manufacturer, inspection and test agencies engaged or required to perform services in connection with installing the roof system.

.2 Insurance/Code Compliance: Where required by code, install and test the roofing system to comply with governing regulation and specified insurance requirements.

.3 Protect other work from spillage of roofing materials and prevent materials from entering or clogging drains and conductors. Replace or restore other work damaged by installation of the modified bituminous roofing system.

.4 Coordinate installation of roofing system components so that insulation and roofing plies are not exposed to precipitation or left exposed overnight. Provide cut-offs at end of each day's work to cover exposed ply sheets and insulation. Remove cut-offs immediately before resuming work.

.5 Cant strips are required at all 90° transitions for modified bitumen work.

.6 Utilize approved flame barrier over combustible materials when utilizing a torch.

.7 Apply roofing materials as specified by manufacturer's instructions. Keep roofing materials dry before and during application.

.8 Fully complete all modified bituminous membrane roofing field assembly work each day. Phased application of the membrane plies will not be accepted.

3.3 INSULATION AND OVERLAY BOARDS

.1 Construct perimeter blocking, crickets and any required slopes to drains.

.2 Adhere insulation and overlay boards, joints are to be offset or staggered 300 mm (12") from adjacent layers and rows. A minus offset tolerance of 50 mm (2") maximum will be permitted to compensate for variance in manufactured tolerance of differing insulation board widths and lengths. The exception is sloped insulation boards that are generally installed shouldered fashion to adjacent rows and the first layer of overlay board, over heat sensitive insulation to facilitate joint taping. However, the upper most layer of insulation or overlay board directly below membranes shall have joints that are offset or staggered from adjacent layers and rows.

3.4 SBS BASE PLY

.1 Ensure base sheet is unrolled to enable membrane to relax prior to installation. Time required for relaxation will vary with weather conditions.

.2 Ensure base sheet membrane is installed parallel to the long side of the underlying insulation overlay board sheet in three (3) gallons per square of adhesive.

.3 Commencing at the lowest point of the roof, adhere the base sheet to a prepared substrate. Apply base sheet with 75 mm (3”) side laps and 203 mm (8”) end laps.

.4 Lightly broom in ply to assure complete adhesion. Do not step on sheet, fish mouths should be cut and patched.

.5 Ensure complete adhesion of ply by maintaining consistent bleed-out at membrane edge.

.6 Extend ply two (2) inches (50mm) beyond top edges of cants at wall and roof projections and equipment bases.

3.5 SBS CAP PLY

.1 Ensure cap sheet is unrolled to enable membrane to relax prior to installation. Time required for relaxation will vary with weather conditions.

.2 Plan membrane application so that laps are not superimposed over laps of the base sheet. Mark a chalk line where the first course is to start. Unroll 2.0 m to 3.0 m of the membrane and line it up to the chalk line or to selvage edge. Reroll and commence application. If the roll goes out of line by more than 12 mm, cut and realign.

.3 Unroll sheet into three (3) gallons per 100 square feet of adhesive and lightly broom in ply to ensure complete adhesion. Do not step on sheet, fish mouths should be cut and patched. Ensure complete adhesion of ply by maintaining consistent bleed-out at membrane edge.

.4 Side laps must cover the selvage edge and be a minimum of 75 mm (3”), end laps must be 203 mm (8”).

.5 Extend membrane two (2) inches (50mm) beyond top edge of all cants.

3.6 FLASHING MEMBRANE INSTALLATION

.1 Prepare all walls, penetrations, expansion joints and where shown to be flashed with asphalt primer. Allow primer to dry tack free.

.2 Install SBS base flashing ply to all perimeter and projection details. Solidly adhere the entire sheet of flashing membrane to the substrate. Base flashing ply to extend past the cant on the field of the roof 6”.

.3 Adhere the SBS cap flashing ply to the SBS base flashing ply. Stagger overlaps of cap ply from base ply. Cap flashing ply to extend past the cant on the field of the roof 9”.

.4 Base and cap plies to extend up and over perimeter and be secured to the outside face. Flashings that are not run up and over shall be secured with a termination bar and sealed at the top with flashing cement. On high wall locations, high temperature self-adhering membrane is to be installed in shingle fashion to overlap termination bar and be utilized to seal the wall.

.5 Apply three course of mastic and fiberglass mesh at vertical flashing seams and embed granules. Extend reinforcement from leading edge to top of the flashing membrane.

.6 Seal all curb, wall and parapet flashings with an application of mastic and mesh on a daily basis. Do not permit conditions to exist that will allow moisture to enter behind, around or under the roof or flashing membrane.

.7 Coordinate counter flashing, cap flashings, expansion joints, and similar work with modified bitumen roofing work.

.8 Coordinate roof accessories, miscellaneous sheet metal accessory items, including piping vents and other devices with the roofing system work.

.9 Apply liquid reinforced flashing at all otherwise unfinished terminations of the membrane.

3.7 APPLICATION OF SURFACING

.1 Apply surfacing aggregate at five hundred (500) lbs. (226kg) per square. Uniformly embed aggregate in adhesive at a rate of 5 gallons per square coverage after flashings, tests, repairs, and corrective actions have been completed and approved.

.2 Allow system to cure for approximately 30 days prior to application of adhesive flood

coat and specified roofing gravel.

3.8 PROJECT NOTES

.1 Roofing Contractor to verify all dimensions, sizes, product requirements, and current roof system composition including insulation thickness and deck type.

.2 The disconnection and reconnection/installation of all mechanical and HVAC equipment is to be completed by a mechanical contractor on behalf of the Owner. Coordination of work between contractors will be required.

.3 The existing membrane will be peeled from top layer of wood fiber insulation. Existing insulation will be left in place, replacing only that which contains moisture or dampness with equivalent insulation type and thickness.

.4 The roofing contractor is responsible for keeping drains and vents clear of construction debris during the project and at project completion.

.5 Curbs which are below minimum height of 8” are to be raised to meet RGC Guarantee standard.

.6 Sump drains in 4’ x 4’ area by shaving insulation and overlay board to create a small taper.

.7 Perform rough carpentry as required to meet guidelines and replacement design. Curbs which are below minimum height of 8” are to be raised to meet RGC Guarantee standard.

.8 Install new 24 gauge metal counter flashings, coping caps. Colour is to be chosen by and acceptable to the owner. All metal must be done in strict accordance to RGC standards.

.9 All sheet metal coping cap / cap flashing joints to be standing seams.

.10 If not present, install overflow scuppers at section perimeters to allow flow off of the building or onto adjacent roof section if drains become plugged.

.11 Caulk all rain collars, flashings, and open metal seams with urethane sealant.

3.9 COMPLETION OF DAY’S WORK

.1 Install water cutoffs at the end of each day’s work; remove completely prior to continuing further roofing applications.

.2 Inspect all laps of the membrane application to ensure they are properly bonded. Repair any deficiencies prior to leaving the site for the day.

.3 Provide fire watch at the end of each day when a torch has been utilized. Review the production area for hot spots.

3.10 CLEANING

.1 Remove drippings from all walls, windows, floors, ladders and finished surfaces.

.2 In areas where finished surfaces are soiled by asphalt or any other sources of soiling caused by work of this section, consult manufacturer of surfaces for cleaning instructions and conform to their instructions.

.3 Repair or replace defaced or disfigured finishes caused by work of this section.

.4 Splices in delivered rolls of membrane are to be removed. Cut back the roll 450 mm (16”) on both sides of the splices and remove prior to installation.

3.11 FINAL INSPECTION

.1 At completion of roofing installation and associated work, meet with Contractor, installer, installer of associated work, Owner, Owner’s representative, and other representatives directly concerned with performance of roofing system.

.2 Walk roof surface areas of the building, inspect perimeter building edges as well as flashing of roof penetrations, walls, curbs and other equipment. List all items requiring correction or completion and furnish copy of list to each party in attendance.

.3 If core cuts verify the presence of damp or wet materials, the Contractor shall be required to replace the damaged areas at his own expense.

.4 Repair or replace deteriorated or defective work found at time above inspection as required to a produce an installation which is free of damage and deterioration at time of Substantial Completion and according to warranty requirements.

.5 Notify the Owner and other representatives upon completion of corrections.

END OF SECTION

1.1 GENERAL

1.2 WORK INCLUDED

.1 Fully adhered SBS modified bituminous membrane roofing over prepared substrate.

1.3 RELATED WORK

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

1.4 REFERENCE STANDARDS

.1 All Reference Standards are latest editions, unless noted otherwise.

.2 CSA A123.3-M1979 (R1992). Asphalt or Tar Saturated Roofing Felt.

.3 CSA A123.4-M1979 (R1992). Bitumen for Use in Construction of Built-Up Roof Coverings and damp proofing and Waterproofing Systems.

.4 CSA A231.2-06 (R2010). Precast Concrete Paving Slabs.

.5 CSA 0151-M1978. Canadian Softwood Plywood.

.6 CAN/CGSB-37.5-M89. Cutback Asphalt Plastic Cement.

.7 CGSB 37-GP-9Ma-83. Primer, Asphalt, Unfilled, for Asphalt Roofing, Damp proofing and Waterproofing.

.8 CAN/CGSB-37.29-M89. Rubber-Asphalt Sealing Compound.

.9 CGSB 37-GP-56M. Membrane, Modified, Bituminous, Prefabricated, and Reinforced for Roofing.

.10 CAN/CGSB-51.33-M89. Vapour Barrier Sheet, Excluding Polyethylene, for Use in Building Construction.

.11 ASTM C578 Type VI. Rigid closed cell, Extruded Polystyrene.

.12 ASTM D1863, Specification for Mineral Aggregate Used as a Protective Coating for Roofing.

.13 ASTM D2824, Specification for Aluminum-Pigmented Asphalt Roof Coating.

.14 ASTM D5147, Test Method for Sampling and Testing Modified Bituminous Sheet Materials.

.15 ASTM D6162, Specification for Styrene Butadiene Styrene (SBS) Modified Bituminous Sheet Materials Using a Combination of Polyester and Glass Fiber Reinforcements.

.16 ASTM D6163, Specification for Styrene Butadiene Styrene (SBS) Modified Bituminous Sheet Materials Using Glass Fiber Reinforcements.

.17 Canadian Roofing Contractors Association (CRCA). Roofing Specification Manual.

.18 Roofing Contractors Association of British Columbia (RCABC). RGC Roofing Practices Manual.

1.5 SUBMITTALS

.1 Product Data: Provide data on material characteristics, performance criteria, limitations, and material samples.

.2 Submit copies of MSDS sheets on all products utilized.

.3 Submit test reports, prepared by an independent testing agency, for all modified bituminous sheet roofing, indicating compliance with CGSB 37-GP-56M or ASTM D5147, and that the materials meet the specified performance requirements.

.4 Submit inspection reports, for application compliance.

1.6 QUALIFICATIONS

.1 Company specializing in modified bituminous roofing installation with a minimum 5 years' experience and authorized by roofing system manufacturer as qualified to install manufacturer's roofing materials. Contractor must be a RCABC member in good standing as of 2017.

.2 Maintain a full-time Supervisor/Foreman on job site during all phases of roofing work and at any time roofing work is in progress. Maintain proper supervision of workmen. Maintain a copy of the specifications in the possession of the Supervisor/Foremen and on the roof at all times.

.3 Immediately correct roof leakage during construction. If the Contractor does not respond within twenty four (24) hours, the Owner has the right to hire a qualified contractor and backcharge the original contractor.

1.7 PRECAUTIONS

.1 Proceed with roofing work only when existing and forecasted weather conditions will permit unit of work to be installed in accordance with manufacturer's recommendations and warranty requirements.

.2 Do not expose materials vulnerable to water or sun damage in quantities greater than can be weatherproofed during same day.

.3 Roofing application shall not be carried out when materials are damp. Apply each part of roofing system only when surfaces are clean and dry.

.4 All adjacent parts of the building shall be protected from damage caused by roofing operations. Cover walls and other surfaces in the vicinity of hoisting apparatus with heavy canvas or other suitable protective material. Any damage caused under this contract shall be repaired to match the original materials and appearance.

.5 Locate equipment and materials well away from building in areas designated by the Owner.

.6 Conduct operations so as to leave deck exposed for minimum period of time. Protect, as required, to prevent water infiltration to building interior.

.7 Where work must continue over finished roofing membrane, protect surface with minimum 12.5 mm thick plywood sheets.

.8 Fire Extinguishers: Maintain at least one fully-charged fire extinguisher with shutoff nozzle, ULC labelled for A, B and C class per torch applicator, within 10 m of each torch applicator. Strictly adhere to all safety guidelines for the torching of modified bituminous membrane.

.9 Any sharp projections that may puncture the membrane shall be grounded smooth and flush.

.10 Fully complete all modified bituminous membrane roofing field assembly work each day. Phased application of the membrane plies will not be accepted.

1.8 DELIVERY, STORAGE AND HANDLING

.1 Deliver, store and maintain packaged materials with the manufacturer's seals and labels intact, dry and undamaged.

.2 Store and handle roofing sheets in a dry, well-ventilated, weather-tight place to ensure no possibility of significant moisture exposure. Store rolls of felt and other sheet materials on pallets or other raised surface on end.

.3 Immediately remove rejected materials from the Place of Work.

.4 Storage and handling of materials shall conform to the Workers' Compensation Board of British Columbia Regulations and the manufacturer's instructions.

.5 It is the responsibility of the contractor to secure all material and equipment on the job site. If any material or equipment is stored on the roof, the contractor must make sure that the integrity of the deck is not compromised at any time.

.6 All containers to be labelled in accordance with WHMIS regulations.

.7 Provide Material Safety Data Sheets (MSDS) if requested.

1.9 COMPATIBILITY

.1 Compatibility between all components of roofing system is essential.

.2 The Contractor shall be responsible for ensuring that all items elected for use are compatible with each other.

.3 Ensure compliance with RGC warranty standards and manufacturers installation recommendations.

1.10 STANDARDS

.1 In the event that the drawings and specifications differ from the manufacturer's printed instruction, to such a degree that the specified warranties may be affected, consult the Owners representative for instructions.

1.11 INSPECTIONS

.1 When the project is in progress, the Owner's representative will provide the following:

.1 Keep the Owner informed as to the progress and quality of the work as observed.
.2 Provide daily job site inspections during the roof assembly application.
.3 Report to the Owner in writing any failure or refusal of the Contractor to correct unacceptable practices called to the Contractor's attention.
.4 Confirm after completion that there are no application procedures in conflict with the specifications other than those that may have been previously reported and corrected.

1.12 WARRANTY

.1 Upon completion of installation, and acceptance by the Owner, the roofing Contractor shall issue a 5 year workmanship warranty for the modified bitumen membrane roof system on Contractor letterhead, signed, authorized and executed. In event any work related to roofing, flashing, or metal is found to be within Contractor's warranty term, defective or otherwise not in accordance with Contract Documents, Contractor to repair that defect at no cost to Owner.

.2 The roofing membrane manufacturer shall issue to the Building Owner a twenty (20) year, non-prorated, leak-free guarantee including workmanship and materials for the modified bitumen roof system.

2.1 <u>PRODUCTS</u>

2.2 ACCEPTABLE PRODUCTS

.1 When a particular trade name or performance standard is specified it shall be indicative of a standard required.

.2 Any item or materials submitted as an alternate to the specified products must comply in all respects as to the quality and performance. The Owner shall be the sole judge as to whether or not an item submitted as an equal is truly equal. Should the contractor choose to submit on the equal basis, he shall assume all risk involved, monetary or otherwise should the Owner find it unacceptable.

.3 Requests for approval must reach the Owners representative at least seven (7) working days prior to the bid closing. The Owners representative shall advise applicants of the status of their request three (3) working days prior to bid closing.

.4 Request for approval must be submitted by bidding contractors only, and shall include:

.1 Project name and number.
.2 Specification sections to which the product/system applied.
.3 Description of proposed substitution including manufacturer's material specifications, manufacturer's preparation and application requirements, manufacturer's inspection intervals, and manufacturer's warranties.
.4 Sample product indicating surface finish and material thickness to be applied under Contract.
.5 Independent test reports indicating compliance with specified product performance levels.
.6 Installation history of proposed alternative including:
.1 Projects and locations
.2 Approximate value of contract
.3 Approximate size of projects
.4 Number of years in use
.5 Type of usage
.6 Name of Owner and Consultant involved

.5 When submitting alternatives to materials or equipment specified, Bidders shall include in their Bid any changes in the work required to accommodate such alternatives. A later claim for addition to the Contract Price because of changes in the work necessitated by the use of alternatives will not be considered.

.6 An addendum will be issued prior to bid closing if an alternative is approved. No alternative materials or equipment will be considered after bid closing.

2.3 DESCRIPTION

.1 All labour, material, equipment and services to supply and install a two ply fully adhered roofing system as specified herein including but not limited to:

.1 One ply of SBS base sheet fully adhered.
.2 One ply of SBS cap sheet fully adhered.
.3 Gypsum board fully adhered to substrate with fire retardant tape at seams.
.4 Wood blocking, as required.
.5 Associated roof flashing and sheet metal.

2.4 ROOFING ASSEMBLY MATERIALS

.1 Base Sheet: One (1) ply SBS (Styrene-Butadiene-Styrene) 2.5 mm fiberglass reinforced membrane. ASTM D6163, Type III, Grade S. ASTM D5147 at 23°C Tensile MD/CMD 30 kN/m, Tear MD/CMD 1300 N, Elongation MD/CMD 5.0%, Low Temp Flex: Pass.

.2 Cap Sheet: One (1) ply SBS (Styrene-Butylene-Styrene) 4.5mm fiberglass and polyester composite scrim. ASTM D6162, Type III, Grade S. ASTM D5147 at 23°C Tensile MD/CMD 50 kN/m, Tear MD/CMD 2200 N, Elongation MD/CMD 5.0%, Low Temp Flex: Pass.

.3 Membrane Surfacing Adhesive: Cold process modified adhesive for adhesion of roofing aggregate.

.4 Roofing Aggregate: Clean roofing aggregate to conform to ASTM D-1863 in cold membrane surfacing adhesive.

.5 Overlay Board: Securock (1/4") water-resistant high performance board, Class A Fire Rating, Recycled Content 95%.

.6 Insulation Adhesive: 2-part adhesive compatible for use with substrate and insulation types specified, as recommended by the manufacturer.

.7 Screws, Bolts, Nails and Fasteners: Non-ferrous metal or galvanized steel compatible with adjacent surfaces, except that hard copper nails shall be used with copper; aluminum or stainless steel nails shall be used with aluminum; and stainless steel nails shall be used with stainless steel. All fasteners must conform to the RGC Guarantee Standards. Fasteners in contact with pressure treated wood must be 304 or 316 stainless steel.

.8 Cant Strip: Cant strips are required at all 90° transitions for modified bitumen work.

.9 Mastic Compound: V.O.C. compliant, ASTM D2822, Type II. Trowel grade fibered mastic.

.10 Fiberglass Scrim: SBR coated reinforced fiberglass reinforcement scrim meeting ASTM D-1668-86 Type III.

.11 Caulking Compound: One part, non-sag sealant with the following characteristics;

.1	Tensile Strength (ASTM D412)	250 psi
.2	Elongation (ASM D412)	950%
.3	Hardness, Shore A (ASTM C920)	35
.4	Adhesion-in-Peel (ASTM C920)	30 pli

.12 Non-Shrink Grout: Use an all-weather fast setting chemical action concrete material to fill pitch pans.

1.	Flexural Strength (ASTM C-78 (modified))	7 days 1100psi
2.	High Strength (ASTM C-109 (modified))	24 days 8400lbs (3810kg)

.13 Pitch Pocket Sealer: Two part, 100% solids, self-leveling, polyurethane sealant for filling pitch pans as recommended and furnished by the membrane manufacturer.

1.	Durometer (ASTM D2240)	40-50 Shore
2.	Elongation (ASTM D 412)	250%
3.	Tensile Strength (ASTM D 412)	200 @ 100 mil

.14 Vents and Breathers: Heavy gauge aluminum and fully insulated vent that allows moisture and air to escape but not enter the roof system as recommended by the membrane manufacturer.

.15 Roof Drains: Retrofit clamp-tite drain with u-flow seal and aluminum dome strainer.

.16 Pitch pans, Rain Collar 24 gauge stainless or 20oz (567gram) copper. All joints should be welded/soldered watertight. See details for design.

.17 Plumbing stacks should be spun aluminum meeting CSA Standard B79 with vandal-proof caps.

.18 Sheet Metal Flashings: 24 gauge completed in accordance with accepted RGC Guarantee Standards and drawings conforming to ASTM A653 / A653M-06 CS Type B, Z275 (G90) coating. Colour to be chosen by owner.

.19 Asphalt Primer: Asphalt emulsion based primer to prepare surfaces for torch applied membranes.

.20 Liquid Flashing: Shall be composed of polyester fleece reinforcement encapsulated with a polymethel methacrylate (PMMA) resin.

2.5 SCOPE OF WORK

.1 Set up work site with appropriate disposal equipment and place plywood on adjacent roof areas (having roofer traffic) so that existing membrane does not get damaged.

.2 Remove existing metal counterflashings within replacement areas and dispose to an authorized dumpsite.

.3 Remove existing roofing membrane (skim) down to the fiberboard overlay.

.4 Check the existing insulation and replace all wet areas (extra).

.5 Adhere 1/4" Securock to the substrate with 2-part adhesive (as per adhesive manufacturer's recommendations).

.6 Install new fiberglass cant strips in cold adhesives (as per adhesive manufacturer's recommendations) at all horizontal to vertical transitions, including sleepers.

.7 Tape all seams.

.8 Install one layer of SBS Torch Base Sheet to a properly prepared substrate. Shingle in proper direction to shed water on each area of roofing.

.9 Install 1 ply of cap sheet modified membrane. Seams for the top layer of modified membrane will be staggered over the SBS Torch Base Sheet seams.

.10 Prepare the perimeter walls and prime the surfaces with asphalt primer. Install new flashings surrounding and within area with SBS base and cap sheet. Flashings to extend minimum 8" above cant, and 8" onto field. SBS cap sheet at perimeter to extend above and over top of raised edge and terminated along outer edge with cap nails 8" O.C. All other tops of flashings to be completed with termination bar (fasteners every 8" O.C.) and rubberized mastic mastic along top edge.

.11 Membrane on the slopped perimeters shall be granulated.

.12 Waterproof the large concrete parapet with high temp self adhering membrane, seal all seams and clad with colour matching counter flashing.

.13 All counter flashing terminations at the brick wall must be reglet joints.

.14 Install new copper span drain with blue-seal connectors.

.15 Seal all vertical laps of flashing membrane with a three-course application of trowel-grade mastic and fiberglass mesh. Reinforce all vertical seams with Mastic / Mesh / Mastic**.**

.16 Phased roofing not permitted. Clean entire project of debris and remove all equipment.

.17 Metal counter-flashings on perimeter are to extend down from coping cap to field of roof.

3.0 EXECUTION

3.1 EXAMINATION

.1 Verify that surfaces and project conditions are ready to receive work of this section.

.2 Verify that deck is supported and secured to structural members.

.3 Verify that the surface is clean and smooth, free of depressions, projections or ripples, and is properly sloped to valleys and drains.

.4 Verify that the substrate is dry and free of snow or ice.

.5 Verify that openings, curbs, pipes, conduit, sleeves, ducts, and other items which penetrate the roof are set solidly, and that cant strips, nailing strips and reglets are set in place.

3.2 GENERAL INSTALLATION REQUIREMENTS

.1 Cooperate with manufacturer, inspection and test agencies engaged or required to perform services in connection with installing the roof system.

.2 Insurance/Code Compliance: Where required by code, install and test the roofing system to comply with governing regulation and specified insurance requirements.

.3 Protect other work from spillage of roofing materials and prevent materials from entering or clogging drains and conductors. Replace or restore other work damaged by installation of the modified bituminous roofing system.

.4 Coordinate installation of roofing system components so that insulation and roofing plies are not exposed to precipitation or left exposed overnight. Provide cut-offs at end of each day's work to cover exposed ply sheets and insulation. Remove cut-offs immediately before resuming work.

.5 Cant strips are required at all 90° transitions for modified bitumen work.

.6 Utilize approved flame barrier over combustible materials when utilizing a torch.

.7 Apply roofing materials as specified by manufacturer's instructions. Keep roofing materials dry before and during application.

.8 Fully complete all modified bituminous membrane roofing field assembly work each day. Phased application of the membrane plies will not be accepted.

3.3 OVERBOARD

.1 Adhere 3/8" Securock in two-part adhesive, as per adhesive manufacturer's instructions. Joints are to be offset or staggered 300 mm (12") from adjacent layers and rows. A minus offset tolerance of 50 mm (2") maximum will be permitted to compensate for variance in manufactured tolerance of differing insulation board widths and lengths.

3.4 SBS BASE PLY

.1 Ensure base sheet is unrolled to enable membrane to relax prior to installation. Time required for relaxation will vary with weather conditions.

.2 Apply asphalt primer to gypsum surface and allow to dry.

.3 Install one layer of SBS torch base sheet to a properly prepared substrate. Shingle in proper direction to shed water on each area of roofing.

.4 To a suitable substrate, lay out the roll in the course to be followed and unroll six (6) feet (1.8m).

.5 Using a roofing torch, heat the surface of the coiled portion until the burn-off backer melts away and a puddle of asphalt develops at the base of the roll. At this point, the material is hot enough to lay into the substrate. Progressively heat and unroll the sheet into the continuous puddle of asphalt.

.6 After the major portion of the roll is bonded, re-roll the first six (6) feet (1.8m) and bond it in a similar fashion.

.7 Repeat this operation with subsequent rolls with side laps of four (4) inches (101mm) and end laps of eight inches.

.8 Give each lap a finishing touch by passing the torch along the joint and spreading the melted bitumen evenly with a rounded trowel to insure a smooth, tight seal.

.9 Extend underlayment two (4) inches (100mm) beyond top edges of cants at wall and projection bases.

.10 Install base flashing ply to all perimeter and projections details, extending 6” onto the field.

3.5 SBS CAP PLY

.1 Both base and cap membrane plies must be installed the same day.

.2 Ensure cap sheet is unrolled to enable membrane to relax prior to installation. Time required for relaxation will vary with weather conditions.

.3 Over the SBS base sheet, lay out the roll in the course to be followed and unroll six (6) feet. Plan membrane application so that laps are not superimposed over laps of the base sheet. Mark a chalk line where the first course is to start. Unroll 2.0 m to 3.0 m of the membrane and line it up to the chalk line or to selvage edge. Reroll and commence application. If the roll goes out of line by more than 12 mm, cut and realign.

.4 Using the same methodology as the base sheet, install the cap sheet, ensuring that the membrane is unrolled into a consistent puddle of asphalt.

.5 Extend membrane two (2) inches (50mm) beyond top edge of all cants.

.6 Trowel check sidelaps and endlaps.

3.6 FLASHING MEMBRANE INSTALLATION

.1 Prepare all walls, penetrations, expansion joints and where shown to be flashed with asphalt primer. Allow primer to dry tack free.

.2 Install SBS base flashing ply to all perimeter and projection details. Solidly adhere the entire sheet of flashing membrane to the substrate. Base flashing ply to extend past the cant on the field of the roof 6".

.3 Adhere the SBS cap flashing ply to the SBS base flashing ply. Stagger overlaps of cap ply from base ply. Cap flashing ply to extend past the cant on the field of the roof 9".

.4 Trowel check sidelaps and endlaps.

.5 Base and cap plies to extend up and over perimeter and be secured to the outside face. Flashings that are not run up and over shall be secured with a termination bar and sealed at the top with flashing cement. On high wall locations, high temperature self-adhering membrane is to be installed in shingle fashion to overlap termination bar and be utilized to seal the wall.

.6 Apply three course of mastic and fiberglass mesh at vertical flashing seams. Extend reinforcement from leading edge of flashing membrane to the top of the flashing membrane.

.7 Seal all curb, wall and parapet flashings with an application of mastic and fiberglass on a daily basis. Do not permit conditions to exist that will allow moisture to enter behind, around or under the roof or flashing membrane.

.8 Coordinate counter flashing, cap flashings, expansion joints, and similar work with modified bitumen roofing work.

.9 Coordinate roof accessories, miscellaneous sheet metal accessory items, including piping vents and other devices with the roofing system work.

.10 Apply liquid reinforced flashing at all otherwise unfinished terminations of the membrane.

3.7 APPLICATION OF SURFACING

.1 Apply 5 gallons/ square of cold emulsion to the dry membrane and gravel with 500 lb of round 5/8 pea gravel.

3.8 PROJECT NOTES

.1 Roofing Contractor to verify all dimensions, sizes, product requirements, and current roof system composition including insulation thickness and deck type.

.2 The disconnection and reconnection/installation of all mechanical and HVAC equipment is to be completed by a mechanical contractor on behalf of the Owner. Coordination of work between contractors will be required.

.3 The roofing contractor is responsible for keeping drains and vents clear of construction debris during the project and at project completion.

.4 At areas of paver installation, install pavers evenly so not to create tripping hazards.

.5 Sump drains in 4’ x 4’ area by shaving insulation and overlay board to create a small taper.

.6 Perform rough carpentry as required to meet guidelines and replacement design. Curbs which are below minimum height of 8” are to be raised to meet RGC Guarantee standard.

.7 Install new 24 gauge metal counter flashings. Colour is to be chosen by and acceptable to the owner. All metal must be done in strict accordance to RGC standards.

.8 All sheet metal coping cap / cap flashing joints to be standing seams.

.9 If not present, install overflow scuppers at section perimeters to allow flow off of the building or onto adjacent roof section if drains become plugged.

.10 Caulk all rain collars, flashings, and open metal seams with urethane sealant.

3.9 COMPLETION OF DAY’S WORK

.1 Install water cutoffs at the end of each day’s work; remove completely prior to continuing further roofing applications.

.2 Inspect all laps of the membrane application to ensure they are properly bonded. Repair any deficiencies prior to leaving the site for the day.

.3 Provide fire watch at the end of each day when a torch has been utilized. Review the production area for hot spots.

3.10 CLEANING

.1 Remove drippings from all walls, windows, floors, ladders and finished surfaces.

.2 In areas where finished surfaces are soiled by asphalt or any other sources of soiling

caused by work of this section, consult manufacturer of surfaces for cleaning instructions and conform to their instructions.

.3 Repair or replace defaced or disfigured finishes caused by work of this section.

.4 Splices in delivered rolls of membrane are to be removed. Cut back the roll 450 mm (16”) on both sides of the splices and remove prior to installation.

3.11 FINAL INSPECTION

.1 At completion of roofing installation and associated work, meet with Contractor, installer, installer of associated work, Owner, Owner’s representative, and other representatives directly concerned with performance of roofing system.

.2 Walk roof surface areas of the building, inspect perimeter building edges as well as flashing of roof penetrations, walls, curbs and other equipment. List all items requiring correction or completion and furnish copy of list to each party in attendance.

.3 If core cuts verify the presence of damp or wet materials, the Contractor shall be required to replace the damaged areas at his own expense.

.4 Repair or replace deteriorated or defective work found at time above inspection as required to a produce an installation which is free of damage and deterioration at time of Substantial Completion and according to warranty requirements.

.5 Notify the Owner and other representatives upon completion of corrections.

END OF SECTION

1.1 GENERAL

1.2 RELATED SECTIONS

.1 Section 07 31 13.13 - Fiberglass-Reinforced Asphalt Shingles

.2 Section 07 52 16.11 – Cold Adhesive Modified Bituminous Membrane Roofing

.3 Section 07 52 16.13 – Torch-Applied Modified Bituminous Membrane Roofing

.4 Section 07 55 52 – Torch-Applied Modified Bituminous Protected Membrane Roofing

.5 Section 07 92 00 – Joint Sealants

1.3 REFERENCES

.1 American Society for Testing and Materials (ASTM International)

.1 ASTM A591/A591M-98, Standard Specification for Steel Sheet, Electrolytic Zinc-Coated, for Light Coating Applications.

.2 ASTM A653/A653M-01a, Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.

.3 ASTM A792/A792M-02, Standard Specification for Steel Sheet, 55% Aluminum-Zinc Alloy-Coated by the Hot-Dip Process.

.3 Canadian Roofing Contractors Association (CRCA)

.1 Roofing Specifications Manual 1997.

.4 Canadian General Standards Board (CGSB)

.1 CAN/CGSB-93.1-M85, Sheet Aluminum Alloy, Prefinished, Residential.

.5 Canadian Standards Association (CSA International)

.6 RGC Roofing Practices Manual, Roofing Contractors Association of British Columbia (RCABC).

.7 Architectural Sheet metal Manual, Sheet metal and Air Conditioning Contractors National Association, Inc (SMACNA).

1.4 SAMPLES

.1 Submit 50 x 50 mm samples of each type of sheet metal material, colour and finish.

2.1 PRODUCTS

2.2 SHEET METAL MATERIALS

.1 Zinc coated steel sheet: 0.61 mm thickness, commercial quality to ASTM A653/A653M, with Z275 designation zinc coating.

.2 Aluminum-zinc alloy coated steel sheet: to ASTM A792/A792M, commercial quality, grade 33 with AZ180 coating.

2.3 PREFINISHED STEEL SHEET

.1 Prefinished steel with factory applied polyvinyl fluoride.

.1 Class F1S

.2 Colour selected by Owner.

.3 Specular gloss: 30 units +/- in accordance with ASTM D523.

.4 Coating thickness: not less than 25 microns.

.1 Prefinished steel with factory applied silicone modified polyester. Low slope roof areas unless colour match cannot be achieved with PVF2 on sloped roof areas.

.1 Class F2S.

.2 Colour selected by Owner.

.3 Specular gloss: 30 units +/- 5 in accordance with ASTM D523.

.5 Coating thickness: not less than 25 microns.

2.4 ACCESSORIES

.1 Cleats: of same material, and temper as sheet metal, minimum 150 mm wide. Thickness 0.76 mm.

.2 Fasteners: of same material as sheet metal, to CSA B111, Sheet metal screws with integral washers and neoprene grommets.

.3 Washers: of same material as sheet metal, 1 mm thick with rubber packings.

.4 Touch-up paint: as recommended by prefinished material manufacturer.

2.5 FABRICATION

.1 Fabricate metal flashings and other sheet metal work in accordance with SMACNA and as indicated.

.2 Form pieces in 2400 mm maximum lengths. Make allowance for expansion at joints.

.3 Hem exposed edges on underside 12 mm. Mitre and seal corners with sealant.

.4 Form sections square, true and accurate to size, free from distortion and other defects detrimental to appearance or performance.

.5 Apply isolation coating to metal surfaces to be embedded in concrete or mortar.

2.6 METAL FLASHINGS

.1 Form flashings, copings and fascias to profiles indicated of 0.61mm prefinished sheet metal.

3.1 EXECUTION

3.2 INSTALLATION

.1 Install sheet metal work in accordance with SMACNA detail and RCABC acceptance requirements and as shown on drawings.

.2 Counter-flashing to extend down to roof level to conceal modified bitumen flashing membrane.

.3 Use concealed fastenings except where approved before installation. Fasteners penetrating horizontal surfaces or cap flashings of any kind are not acceptable.

.4 Provide underlay under sheet metal. Secure in place and lap joints 100 mm.

.5 Counterflash bituminous flashings at intersections of roof with vertical surfaces and curbs. To extend down to roof level. Flash joints using S-lock in general with standing seams forming tight fit over hook strips, at terminations and corners.

.6 Lock end joints and caulk with sealant.

.7 All cap flashings to have sloping surfaces, minimum 10% slope unless indicated otherwise on drawings.

.8 All sheet metal coping cap / cap flashing joints to be standing seams.

END OF SECTION

PART 1 - GENERAL

1.1 RELATED SECTIONS

.1 Section 01 11 00 – Summary of Work

.2 Section 02 41 13 – Selective Demolition & Removal

.3 Section 07 31 13.13 - Fiberglass-Reinforced Asphalt Shingles

.4 Section 07 52 16.11 – Cold Adhesive Modified Bituminous Membrane Roofing

.5 Section 07 52 16.13 – Torch-Applied Modified Bituminous Membrane Roofing

.6 Section 07 55 52 – Torch-Applied Modified Bituminous Protected Membrane Roofing

.7 Section 07 62 00 – Sheet Metal Flashing & Trim

1.2 REFERENCES

Latest edition of all listed references to apply:

.1 ASTM C920 – Elastomeric Joint Sealants

.2 CAN/CGSB-19.13 – Sealing Compound, One-component, Elastomeric, Chemical Curing

.3 Sealants: Professionals' Guide, Sealant, Waterproofing and Restoration Institute

.4 SWRI (Sealant, Waterproofing and Restoration Institute) – Sealant and Caulking Guide Specification

1.3 QUALITY ASSURANCE OBSERVATION

.1 Observation of work will be carried out by designated QA Observer.

.2 Prior to mobilizing on site, prepare and install sealant samples for adhesion testing, a minimum of two (2) samples for each substrate combination, according to manufacturers written guidelines. Test sealant in contact with samples of materials to be caulked to ensure that proper adhesion will be obtained and no staining of material will result. Testing to be completed prior to mobilization on site. Do not proceed with Work until samples have been approved.

.3 Adhesion tests on new sealant will be performed at random locations at discretion of Owner's representative. Any work that is found to be sub-standard, is to be removed and replaced at no cost to Owner. Contractor is to assist with sealant adhesion tests as directed.

.4 Execute Work of this Section by Subcontractors approved by manufacturers of materials incorporated in Work; who has equipment, adequate for Project, and skilled tradesmen to perform it expeditiously; and is known to have been responsible for satisfactory installations similar to that specified during a period of at least immediate past five years.

.5 Remove sealant and re-caulk disapproved joints.

.6 Approved joints will establish minimum acceptable quality of workmanship and will serve as standard by which subsequent Work will be compared for Acceptance.

1.4 DELIVERY, STORAGE, AND HANDLING

.1 Deliver and store materials in original wrappings and containers with manufacturer's seals and labels, intact.

.2 Protect from freezing, moisture, water and contact with ground or floor.

1.5 PROJECT CONDITIONS

.1 Environmental Limitations:

.1 Do not proceed with installation of joint sealants under following conditions:

.1 When ambient and substrate temperature conditions are outside limits permitted by joint sealant manufacturer or are below 4.4 degrees C.

.2 When joint substrates are wet.

.2 Joint-Width Conditions:

.1 Do not proceed with installation of joint sealants where joint widths are less than those allowed by joint sealant manufacturer for applications indicated.

.3 Joint-Substrate Conditions:

.1 Do not proceed with installation of joint sealants until contaminants capable of interfering with adhesion are removed from joint substrates.

1.6 ENVIRONMENTAL AND SAFETY REQUIREMENTS

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

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

1.7 WASTE MANAGEMENT AND DISPOSAL

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

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

.3 Dispose of surplus chemical and finishing materials in accordance with federal regulations.

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

.5 Use trigger operated spray nozzles for water hoses.

.6 Return solvent and oil soaked rags for contaminant recovery and laundering or for proper disposal.

.7 Use least toxic sealants, adhesives, sealers, and finishes necessary to comply with requirements of this section.

.8 Close and seal tightly all partly used sealant containers and store protected in well ventilated fire-safe area at moderate temperature.

.9 Place used hazardous sealant tubes and other containers in areas designated for hazardous materials.

PART 2 - PRODUCTS

2.2 SEALANT MATERIALS

.1 Sealants and caulking compounds must:

.1 meet or exceed all applicable governmental and industrial safety and performance standards.

.2 be manufactured and transported in such a manner that all steps of process, including disposal of waste products arising therefrom, will meet requirements of all applicable governmental acts, by laws and regulations including.

.2 Sealant and caulking compounds must be accompanied by detailed instructions for proper application so as to minimize health concerns and maximize performance, and information describing proper disposal methods.

.3 Caulking that emits strong odours, contains toxic chemicals or is not certified as mould resistant to not be used in or near air handling units.

.4 When low toxicity caulks are not possible, confine usage to areas which offgas to exterior, are contained behind air barriers, or are applied several months before occupancy to maximize offgas time.

.5 Where sealants are qualified with primers use only these primers.

2.3 SEALANT MATERIAL DESIGNATIONS

.1 Acceptable single component neutral cure silicone sealants for skylight related work include:

.1 To CAN/CGSB-19.13.

.1 795 by Dow Corning

.2 Pre-approved alternate.

.2 Acceptable single component, moisture curing, polyurethane sealants for reglets and other roofing related flashing termination work include:

.1 Dymonic by Tremco.

.2 Pre-approved alternate.

.3 Butyl (for concealed skylight related sealant joints): Tremco Curtainwall Sealant or approved alternate.

.4 Primers:

.1 Primers to be as recommended by sealant manufacturer.

.5 Cleaners:

.2 Acceptable cleaners:

.1 Xylol

.2 Methylethylketone (MEK)

.3 Isopropyl Alcohol

.3 Surfaces to receive silicone sealants to not be cleaned with Xylol.

.4 All substrate materials to be cleaned with compatible cleaners.

.6 Preformed Compressible and Non-Compressible back-up materials.

.1 Polyethylene, Urethane, Neoprene or Vinyl Foam:

.1 Extruded closed cell foam backer rod.

.2 Size: oversize 30 to 50 %.

.2 Neoprene or Butyl Rubber

.1 Round solid rod, Shore A hardness 70.

.3 High Density Foam

.1 Extruded closed cell polyvinyl chloride PVC, extruded polyethylene, closed cell, Shore A hardness 20, tensile strength 140 to 200 kPa, extruded polyolefin foam, 32 kg/m3 density, or neoprene foam backer, size as recommended by manufacturer.

.4 Bond Breaker Tape.

.1 Polyethylene bond breaker tape which will not bond to sealant.

.7 Compatibility: All materials in a sealant system to be compatible with each other, with substrate and any coating or waterproofing to be installed. sealants used with elastomeric coating or waterproofing systems must be approved by coating or waterproofing manufacturer.

2.4 JOINT PRIMER

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

.2 Primer as recommended by sealant manufacturer.

PART 3 - EXECUTION

3.1 PROTECTION

.1 Protect existing facades from staining or contamination.

.2 Protect public from falling debris during installation.

.3 At end of each day's work or when stoppage occurs due to inclement weather, provide protection for completed work and materials out of storage. At no time shall unsealed joints be left open. If protection is required, then entire drop/bay to be adequately protected.

3.2 EXAMINATION

.1 Before commencing Work, verify that joint configuration and surfaces have been provided as specified under Work of other Sections to meet intent of sealant Specification, that joint conditions will not adversely affect execution, performance or quality of completed Work and that they can be put into acceptable condition by means of preparation specified in this Section. Verify Site conditions together with manufacturer's representative of sealant to be applied.

.2 Examine existing conditions and substrates upon which work of this section is dependent. Report to Consultant in writing any defects or discrepancies. Commencement of work implies acceptance of existing conditions and assuming full responsibility for finished condition of work.

.3 Ascertain that sealers applied to sealant substrates are compatible with sealant used and that full bond between sealant and substrate is attained. Request samples of sealed or coated substrate from their fabricators for testing of compatibility and bond if necessary.

.4 Examine sealant configuration for width and depth. Depth of joint should be 1/2 joint width with a minimum depth of 6mm (0.25”) and a maximum depth of 13mm (0.5”) unless specified otherwise. For fillet joints, a minimum of 6mm (0.25”) adhesion between sealant and substrate must be achieved on both sides of joint unless specified otherwise.

.5 Defective work resulting from application to unsatisfactory joint conditions will be considered responsibility of those performing work of this section.

3.3 SURFACE PREPARATION

.1 Prepare surfaces in accordance with manufacturer's directions.

.2 Before any sealant repairs are made, type of existing sealant to be determined. If uncertain as to type, then a sealant manufacturer technical representative to be contacted to confirm type. Only sealant compatible with existing to be installed as part of repairs. Urethane based sealants are not to be applied over existing silicone sealants.

.3 Where existing, remove sealant completely. In no case shall new sealant be applied over old. In

addition:

.1 Remove existing sealants, dust, oil, grease, oxidation, mill scale, coatings and all other loose material by cutting, brushing, scrubbing, scraping and/or grinding. In no case, however, shall components be damaged during surface preparation.

.2 Clean substrates with recommended solvent cleaner. Apply solvent with a clean cloth, pad or soft paper towel. Applicator cloth or towel to not leave fiber residue on substrate surface. Surface should be wiped clean and dried with a second clean cloth to ensure removal of contaminants. If substrate surfaces is still not clean, repeat procedures as needed. Change cloths frequently to prevent depositing contaminants from cloth onto substrate surface.

.3 Use method of surface preparation suitable for substrate, as recommended by sealant manufacturer and that does not damage existing finishes.

.4 Examine joint sizes and conditions to establish correct depth to width relationship for installation of backup materials and sealants.

.5 Do not apply sealants to joint surfaces treated with sealer, curing compound, water repellent, or other coatings unless tests have been performed to ensure compatibility of materials. Remove coatings as required.

.6 Ensure joint surfaces are dry and frost free.

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

3.4 PRIMING

.1 Where necessary to prevent staining or for neat appearance, mask adjacent surfaces prior to priming and caulking.

.2 Prime sides of joints in accordance with sealant manufacturer's instructions immediately prior to caulking.

.3 Use only primer approved by sealant manufacturer for particular installation, applying in strict accordance with manufacturers printed recommendations.

.4 Always pour primers onto rag or brush, do not dip rag or brush into container.

.5 Prime only as much area that can be packed and caulked in a single day.

.6 Do not apply excess primer, and apply primer only to areas which it will be contacted by sealant.

3.5 BACKUP MATERIAL

.1 Apply bond breaker tape where installation of backer rod is not possible, three point adhesion needs to be eliminated or throat to width ratio needs to be created as per manufacturers recommendations.

.2 When using backing material comprised of tubular or rod stock, avoid lengthwise stretching of material. Do not twist or braid backer material.

.3 Provide a stiff blunt-surfaced wood or plastic installation tool, having shoulders designed to ride on finished surface and a protrusion of required dimensions to assure a uniform depth of backup material below sealant. Do not puncture exterior skin or surface of backer material. A screwdriver is prohibited for use on this project.

.4 Using approved tool, smoothly and uniformly place backup material to depth indicated on drawings or otherwise required, compressing backer material 25% to 50% and securing a positive fit.

.5 Install backing material to a depth to provide a caulked joint meeting depth requirement as set out in sealant manufacturer's specifications.

3.6 MIXING

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

3.7 APPLICATION

.1 Sealant:

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

.2 Mask edges of joint where irregular surface or sensitive joint border exist to provide neat joint.

.3 Apply sealant in continuous beads.

.4 Apply sealant using gun with proper size nozzle.

.5 Ensure that new sealant is adhered to substrates a minimum of 6 to 10 mm at each side of joint.

.6 Use sufficient pressure to fill voids and joints solid.

.7 Form surface of sealant with full bead, smooth, free from ridges, wrinkles, sags, air pockets, embedded impurities.

.8 Tool exposed surfaces before skinning begins to give slightly concave shape. Tooling to be performed by proper metal or wood tool. Finger tooling joints will not be accepted.

.9 Remove excess compound promptly as work progresses and upon completion.

.2 Curing:

.1 Cure sealants in accordance with sealant manufacturer's instructions.

.2 Do not cover up sealants until proper curing has taken place.

3.8 CLEAN-UP

.1 Clean adjacent surfaces immediately and leave work neat and clean.

.2 Remove excess and droppings, using recommended cleaners as work progresses.

.3 Remove masking tape after initial set of sealant.

END OF SECTION