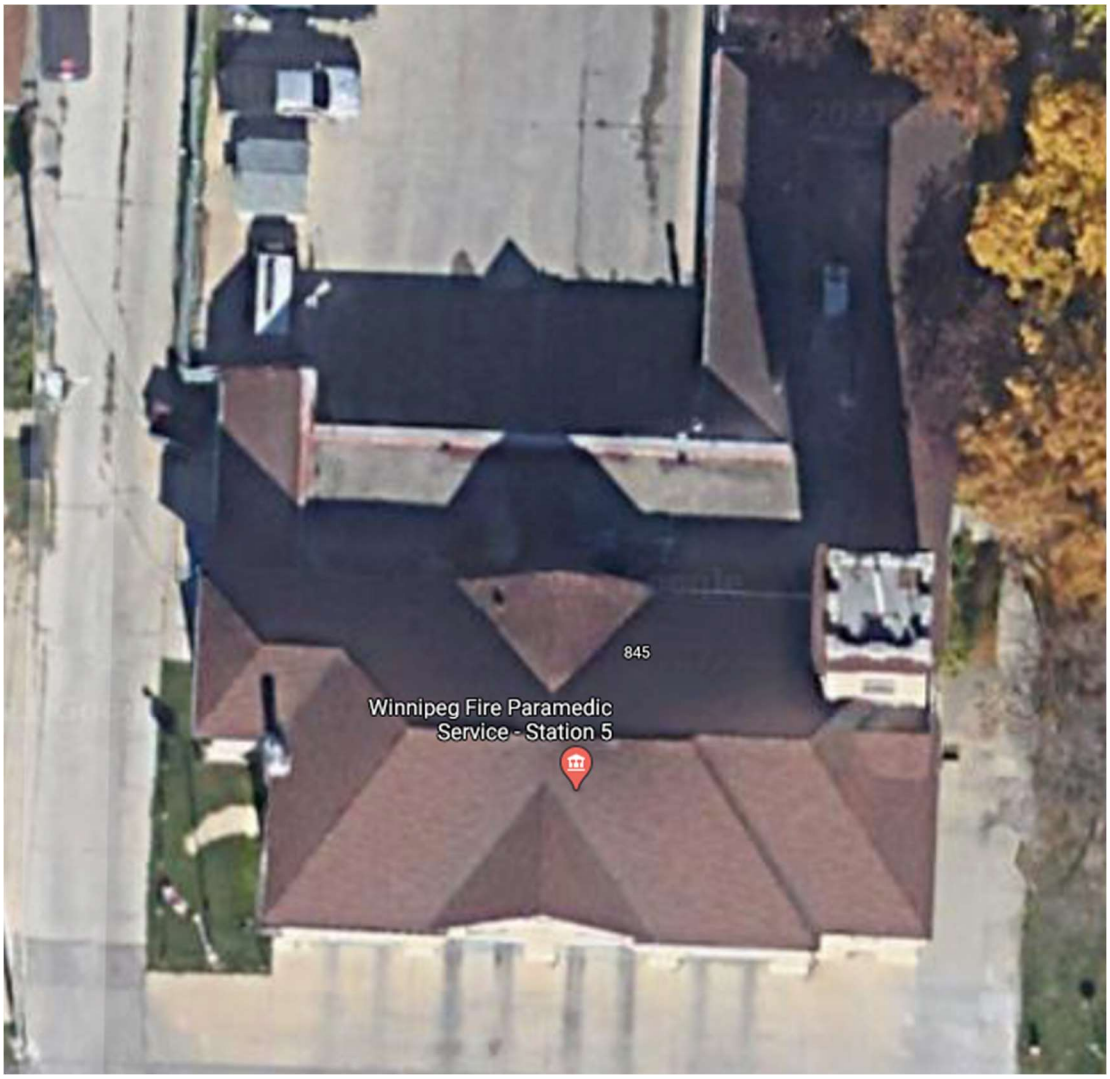
Bid Opportunity

Provision of Partial Roof Replacement at Winnipeg Fire Paramedic Service (WFPS) No.5
845 Sargent Ave., Winnipeg, MB



BID OPPORTUNITY FOR: Provision of Partial Roof Replacement at Winnipeg Fire Paramedic Service (WFPS) No.5 845 Sargent Ave, Winnipeg, MB

DATE: May 10, 2021

PREPARED BY:

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PART A SUMMARY OF WORK

1.1 GENERAL REQUIREMENTS

.1 Furnish all labour, materials, tools and equipment necessary for the removal and disposal of existing low-slope roof (BUR) & steep-slope asphalt shingle systems (Base Bid: Roof-A, C, D & E.), including removal of non-operational roof curbing, flashings, etc, and the design and installation of a complete low-slope roof system capped with SBS modified bitumen two-ply system effective min. R30. (Semi-Adhered Base Sheet & Composite Cap Sheet 4mm.) Steep-Slope to be comprised of laminate fibreglass architectural shingle c/w full water & ice shield and all accessories. Including the accessory items such as new drains, (ensure slope to positive drainage) connections, scuppers, drain inserts, copings, flashings, re-paint gas-lines, rubber blocks c/w roof membrane protection traffic cap, pitch boxes penetration seals c/w liquid sealant, at a minimum.

.2 Base bid system to be:

- .1 Low-Slope: Soprema Colvent & Soprema Sopraply Traffic Cap. Or approved IKO Armourbond fully adhered base. (Adhesive Fastened System)
- .2 Steep-Slope: Asphalt Fibreglass shingles to match Kitchen Mansard Elevation.
- .3 All installed roofing systems must meet Code and Regulatory Requirements along with recommendations of the most current edition as per the followings.

.3 The roof assembly shall be in accordance with CSA A123.21-14 as it pertains to the wind uplift resistance. ULC Standards, ULC approved membranes Class C min. ASTM D 6162-4, system membrane.

.4 All recommendations of the Canadian Roofing Contractors Association (CRCA) “Shall have a design slope minimum of 1.5-2% & 4% back-slope for drainage between drains and denoted perimeter areas as to create effective positive drainage.

.5 Slope flashings to the roof and design roof drains to promote the rapid removal of water from all roof surfaces. Slopes for roofing assembly replacement at existing flat roofs are dependent on practicable heights at perimeters and location of existing roof drains. Including back-slope parapet coping.

.6 Sheet Metal and Air Conditioning Contractor’s National Association, (SMACNA).

.7 CMHC Best Practice Flashing Guide.

.8 All requirements of the Roofing System Manufacturer’s Warranty, (RSMW).

.9 All applicable Province of Manitoba Building Codes.

.10 The manufacturer’s application instructions for each product used are considered part of this specification and should be followed at all times.

.11 Raising, re-setting, and protection of mechanical, air conditioning equipment, ventilators, and exhaust fans may be required. Removal and re-installing of perimeter lighting and electrical if required. Provision for temporary access and protection onto the roof, such as scaffolding, portable railings, plywood and rigid insulation roof protection, etc.

END OF SECTION

PART B SPECIFICATIONS

2.1 CONSTRUCTION FACILITIES

.1 Allow Contract Administrator and City of Winnipeg access to Work areas. If part of Work is in preparation at locations other than Place of Work, allow access to such Work whenever it is in progress.

.2 Give timely notice requesting inspection if Work is designated for special tests, inspections or approvals by Contract Administrator instructions, or law of Place of Work.

.3 If Contractor covers or permits to be covered Work that has been designated for special tests, inspections or approvals before such is made, uncover such Work, have inspections or tests satisfactorily completed and make good such Work.

.4 Contract Administrator will order part of Work to be examined if Work is suspected to be not in accordance with Contract Documents. If, upon examination such work is found not in accordance with Contract Documents, correct such Work and pay cost of examination and correction.

.2 **ACCESS TO WORK**

.1 Allow inspection/testing agencies access to Work.

.2 Co-operate to provide reasonable facilities for such access. During progress of the work, the Contractor shall provide safe access to the work at times suitable for the purposes of monitoring and testing.

.3 **PROCEDURES**

.1 Notify appropriate agency in advance of requirement for tests, in order that attendance arrangements can be made.

.2 Submit samples and/or materials required for testing, as specifically requested in specifications. Submit with reasonable promptness and in orderly sequence to not cause delays in Work.

.3 Provide labour and facilities to obtain and handle samples and materials on site. Provide sufficient space to store and cure test samples.

.4 **REJECTED WORK**

.1 Remove defective Work, whether result of poor workmanship, use of defective products or damage and whether incorporated in Work or not, which has been rejected by Contract Administrator as failing to conform to Contract Documents. Replace or re-execute in accordance with Contract Documents.

.2 Make good other Contractor's work damaged by such removals or replacements promptly.

.3 If in opinion of the Contract Administrator it is not expedient to correct defective Work or Work not performed in accordance with Contract Documents, City of Winnipeg will deduct from Contract Price difference in value between Work performed and that called for by Contract Documents, amount of which will be determined by Contract Administrator.

.5 **REPORTS**

.1 Submit copies of inspection and test reports to City of Winnipeg and Contract Administrator.
.2 Provide copies to subcontractor of work being inspected or tested and manufacturer or fabricator of material being inspected or tested.

.6 **INSTALLATION AND REMOVAL**
.1 Provide temporary utilities controls in order to execute work expeditiously.
.2 Remove from site all such work after use.

.7 **WATER SUPPLY**
.1 The City of Winnipeg will make available, for the extent that it is available, a supply of potable water for construction use at no charge to the Contractor.
.2 The Contractor is to arrange for connection with appropriate utility company and pay costs for installation, maintenance and removal.
.3 The Contractor shall provide all necessary hoses, lines, connections, and other ancillary hardware which may be required.
.4 The services are to be returned to their original condition at the temporary locations or left in an altered condition only as approved by the City of Winnipeg.

.8 **TEMPORARY POWER AND LIGHT**
.1 The City of Winnipeg will make available, for the extent that it is available, temporary power during construction for temporary lighting and operating of power tools.
.2 The Contractor is responsible for the connection of the existing power supply in accordance with Canadian Electrical Code.
.3 The Contractor is to arrange for connection with appropriate utility company. Pay costs for installation, maintenance and removal.
.4 Temporary power for equipment requiring in excess of that available on-site is responsibility of the Contractor.
.5 Provide and maintain temporary lighting throughout project.

.9 **FIRE PROTECTION**
.1 Provide and maintain temporary fire protection equipment during performance of Work required by insurance companies having jurisdiction and governing codes, regulations and bylaws. Burning rubbish and construction waste materials is not permitted on site.
.2 Hot Works are activities that involve open flames or the production of heat or sparks, including, without being limited to, cutting, welding, soldering, brazing, grinding, adhesive bonding, thermal spraying and thawing pipes. A Fire Safety Plan must include "hot works" safety measures for the prevention of fires as described in the Manitoba Fire Code.

END OF SECTION

2.2 TEMPORARY BARRIERS AND ENCLOSURES

.1 ACCESS

.1 Allow access for demolition and construction to the project scope of work area throughout duration of the Work. Access to all work areas shall be via exterior set-up ladders or scaffolding. Provide and maintain ladders and/or scaffolding as required for access throughout duration of the Work.

.2 SCAFFOLDING

.1 Scaffolding shall be design and erected in accordance with Manitoba Regulation 217/2006 and CAN/CSA S269.2.

.1 Where Manitoba Regulation 217/2006 requires scaffolds to be designed by a professional engineer. Submit shop drawings bearing the seal of professional engineer registered in the Province of Manitoba.

.3 SITE STORAGE/LOADING

.1 City of Winnipeg will provide an area on-site for contractors staging and setup usage. Maintain this area for duration of Contract. Contractor to repair any damage resulting from Contractors' use and area to be returned to pre-construction condition once work is completed.

.2 Area for site set-up and material storage is to be arranged and coordinated with City of Winnipeg and Contract Administrator.

.3 Confine work and operations of employees by Contract Documents. Do not unreasonably encumber premises with products.

.4 Do not load or permit to load any part of Work with weight or force that will endanger Work.

.4 CONSTRUCTION PARKING

.1 The Contractor must note that no parking, on City of Winnipeg parking lot, will be made available to site personnel throughout the entire project durations. Street parking is available around this site.

.2 The Contractor will be provided with room, inside the staging/site storage area, for parking a supervisor vehicle and 5ton truck. Contractor to repair any damage resulting from Contractors' use. Area to be returned to pre-construction condition once work is completed

.3 Maintain unrestricted emergency access for emergency vehicles etc. 24hours/7day a week at this facility.

.5 EQUIPMENT, TOOL AND MATERIALS STORAGE

.1 Provide and maintain, in clean and orderly condition, lockable weatherproof sheds for storage of tools, equipment and materials.

.2 Locate materials not required to be stored in weatherproof sheds on site in manner to cause least interference with work activities.

.6 **SANITARY FACILITIES**

.1 Provide sanitary facilities for work force in accordance with governing regulations and ordinances. Setup in the allocated staging/setup area.

.2 Post notices and take precautions as required by local health authorities. Keep area and premises in sanitary condition.

.7 **POLLUTION CONTROL**

.1 Control noxious and hazardous gases. Prevent hazardous accumulations. Control emission from equipment and plant to local authority's emission requirements.

.2 On exterior, cover or wet down dry materials and rubbish to prevent blowing dust and debris. Provide dust control for temporary roads.

.8 **CLEAN-UP**

.1 Remove construction debris, waste materials, packaging material from work site daily.

.2 Clean dirt or mud tracked onto paved or surfaced roadways. As required, this is to be completed daily.

.3 Store materials resulting from demolition activities that are salvageable.

.4 Stack stored new or salvaged material not in construction facilities.

.9 **INSTALLATION AND REMOVAL**

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

.2 Remove from site all such work after use.

.10 **HOARDING**

.1 The Contractor must barricade off the area under construction to prevent the general public from improper access to the construction area. Suitable barricades and protection systems in accordance with local requirements (AHJ) and City of Winnipegs requirements.

.2 Repair surface coatings and/or finishes which are damaged by temporary hoardings and barricades.

.3 Provide adequate signage, fencing, etc. to inform the public of the work being undertaken.

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

.5 As required erect and maintain pedestrian walkways including roof and side covers, complete with signs and electrical lighting as required by law.

.6 Provide temporary support to roof top equipment that stays in place during the course of work.

.7 The Contractor must ensure that adequate protective measures are employed to prevent damage to interior spaces during the construction process. All openings, open wall/roof assemblies, unfinished work, etc. must be protected with appropriate hoardings to provide a weather-tight seal at the end of every workday and as required by environmental conditions. Hoardings must prevent unauthorized access to the construction site and building interior.

.8 Contractor responsible for any damage resulting from insufficiently protected work under construction and/or failure of hoardings/weather seals.

.11 **WEATHER ENCLOSURES**

.1 Provide weather tight closures to unfinished door and window openings, and other openings in floors and roofs.

.2 Close off floor areas where walls are not finished; seal off other openings; enclose building interior work for temporary heat.

.3 Design enclosures to withstand wind pressure and snow loading.

.12 **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.

.13 **FIRE ROUTES**

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

.14 **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.

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

END OF SECTION

2.3 COMMON PRODUCT REQUIREMENTS

.1 REFERENCES

.1 Within text of each specifications section, reference may be made to reference standards. Conform to these reference standards, in whole or in part as specifically requested in specifications.

.2 Conform to latest date of issue of referenced standards in effect on date of submission of Bids, except where specific date or issue is specifically noted.

.3 If there is question as to whether products or systems are in conformance with applicable standards, Contract Administrator reserves right to have such products or systems tested to prove or disprove conformance.

.4 The Cost for such testing will be borne by the Contractor or Supplier.

.2 QUALITY

.1 Products, materials, equipment and articles incorporated in Work shall be new, not damaged or defective, and of best quality for purpose intended. If requested, furnish evidence as to type, source and quality of products provided.

.2 Procurement policy is to acquire, in cost effective manner, items containing highest percentage of recycled and recovered materials practicable consistent with maintaining satisfactory levels of competition. Make reasonable efforts to use recycled and recovered materials and in otherwise utilizing recycled and recovered materials in execution of work.

.3 Defective products, whenever identified prior to completion of Work, will be rejected, regardless of previous inspections. Inspection does not relieve responsibility but is precaution against oversight or error. Remove and replace defective products at own expense and be responsible for delays and expenses caused by rejection.

.4 Should disputes arise as to quality or fitness of products, decision rests strictly with Contract Administrator based upon requirements of Contract Documents.

.5 Unless otherwise indicated in specifications, maintain uniformity of manufacture for any particular or like item throughout building.

.6 Permanent labels, trademarks and nameplates on products are not acceptable in prominent locations, except where required for operating instructions, or when located in mechanical or electrical rooms.

.3 AVAILABILITY

.1 Immediately upon signing Contract, review product delivery requirements and anticipate foreseeable supply delays for items. If delays in supply of products are foreseeable, notify Contract Administrator of such, in order that substitutions or other remedial action may be authorized in ample time to prevent delay in performance of Work.

.2 In event of failure to notify Contract Administrator at commencement of Work and should it subsequently appear that Work may be delayed for such reason, Contract Administrator reserves right to substitute more readily available products of similar character, at no increase in Contract Price or Contract Time.

.4 STORAGE, HANDLING AND PROTECTION

.1 Handle and store products in manner to prevent damage, adulteration, deterioration and soiling and in accordance with manufacturer's instructions when applicable.
.2 Store packaged or bundled products in original and undamaged condition with manufacturer's seal and labels intact. Do not remove from packaging or bundling until required in Work.
.3 Store products subject to damage from weather in weatherproof enclosures.
.4 Store cementitious products clear of earth or concrete floors, and away from walls.
.5 Keep sand, when used for grout or mortar materials, clean and dry. Store sand on wooden platforms and cover with waterproof tarpaulins during inclement weather.
.6 Store sheet materials, lumber on flat, solid supports and keep clear of ground. Slope to shed moisture.
.7 Remove and replace damaged products at own expense and to satisfaction of Contract Administrator.
.8 Touch-up damaged factory finished surfaces to Contract Administrator's satisfaction. Use touch-up materials to match original. Do not paint over name plates.

.5 **TRANSPORTATION**

.1 Pay costs of transportation of products required in performance of Work.

.6 **MANUFACTURER'S INSTRUCTIONS**

.1 Unless otherwise indicated in specifications, install or erect products in accordance with manufacturer's instructions. Do not rely on labels or enclosures provided with products. Obtain written instructions directly from manufacturers.
.1 Notify Contract Administrator in writing, of conflicts between specifications and manufacturer's instructions, so that Contract Administrator will establish course of action. Where conflicts exist, the more stringent instruction will be enforced.
.2 Improper installation or erection of products, due to failure in complying with these requirements, authorizes Contract Administrator to require removal and re-installation at no increase in Contract Price or Contract Time.

.7 **QUALITY OF WORK**

.1 Ensure Quality of Work is of highest standard, executed by workers experienced and skilled in respective duties for which they are employed. Immediately notify Contract Administrator if required Work is such as to make it impractical to produce required results.
.2 Do not employ anyone unskilled in their required duties. Contract Administrator reserves right to require dismissal from site, workers deemed incompetent or careless.
.3 Decisions as to standard or fitness of Quality of Work in cases of dispute rest solely with Contract Administrator, whose decision is final.

.8 **CO-ORDINATION**

.1 Ensure co-operation of workers in laying out Work. Maintain efficient and continuous supervision.

.2 Be responsible for coordination and placement of openings, sleeves and accessories.

.9 **REMEDIAL WORK**

.1 Perform remedial work required to repair or replace parts or portions of Work identified as defective or unacceptable. Co-ordinate adjacent affected Work as required.

.2 Perform remedial work by specialists familiar with materials affected. Perform in a manner to neither damage nor put at risk any portion of Work.

.10 **PROTECTION OF WORK IN PROGRESS**

.1 Prevent overloading of parts of building. Do not cut, drill or sleeve load bearing structural member, unless specifically indicated without written approval of Contract Administrator.

.11 **EXISTING UTILITIES**

.1 When breaking into or connecting to existing services or utilities, execute Work at times directed by local governing authorities, with minimum of disturbance to Work, and/or building occupants. Protect, relocate or maintain existing active services. When services are encountered, cap off in manner approved by authority having jurisdiction. Stake and record location of capped service.

END OF SECTION

2.4 CLEANING

.1 CLEANING

.1 Maintain Work in tidy condition, free from accumulation of waste products and debris, other than that caused by City of Winnipeg or other Contractors.

.2 Remove waste materials from site at daily regularly scheduled times. Do not burn waste materials on site.

.3 Make arrangements with and obtain permits from authorities having jurisdiction for disposal of waste and debris.

.4 Provide on-site containers for collection of waste materials and debris.

.5 Dispose of waste materials and debris off site.

.6 Clean interior areas prior to start of finishing work and maintain areas free of dust and other contaminants during finishing operations.

.7 Store volatile waste in covered metal containers and remove from premises at end of each working day.

.8 Provide adequate ventilation during use of volatile or noxious substances. Use of building ventilation systems is not permitted for this purpose.

.9 Use only cleaning materials recommended by manufacturer of surface to be cleaned, and as recommended by cleaning material manufacturer.

.10 Schedule cleaning operations so that resulting dust, debris and other contaminants will not fall on wet, newly painted surfaces nor contaminate building systems.

.2 FINAL CLEANING

.1 When Work is Substantially Performed remove surplus products, tools, construction machinery and equipment not required for performance of remaining Work.

.2 Remove waste products and debris other than that caused by others and leave Work clean and suitable for occupancy.

.3 Prior to final review remove surplus products, tools, construction machinery and equipment.

.4 Remove waste products and debris other than that caused by City of Winnipeg or other Contractors.

.5 Remove waste materials from site at regularly scheduled times. Do not burn waste materials on site.

.6 Make arrangements with and obtain permits from authorities having jurisdiction for disposal of waste and debris.

.7 Remove stains, spots, marks and dirt from existing surfaces, fixtures, and finishes within the work area or affected by the affected by the Work.

.8 Broom clean and wash exterior walks, steps and surfaces; rake clean other surfaces of grounds.

.9 Remove dirt and other disfiguration from exterior surfaces.

.10 Sweep and power wash clean all work areas.

.11 Remove construction debris from drain and pits.

END OF SECTION

2.5 CLOSEOUT PROCEDURES

.1 REFERENCES

.1 Canadian Construction Documents Committee (CCDC)

.2 CCDC 2-2008, Stipulated Price Contract.

.2 ADMINISTRATIVE REQUIREMENTS

.1 Acceptance of Work Procedures:

.1 Notify Contract Administrator in writing of satisfactory completion of Contractor's inspection and submit verification that corrections have been made.

.2 Request Contract Administrator's Review.

.2 Contract Administrator's Review:

.1 Contract Administrator and Contractor to review Work and identify defects and deficiencies

.2 Contractor to correct Work as directed.

.3 Completion Tasks: submit written certificates that tasks have been performed as follows:

.1 Work: completed and inspected for compliance with Contract Documents.

.2 Defects: corrected and deficiencies completed.

.3 Work: complete and ready for Final Review.

.4 Final Review:

.1 When completion tasks are done, request final review of Work by Contract Administrator, and Contractor.

.2 When Work incomplete according to Contract Administrator, complete outstanding items and request another review.

.5 Declaration of Substantial Performance: when Contract Administrator considers deficiencies and defects corrected and requirements of Contract substantially performed, make application for Certificate of Substantial Performance.

.6 Commencement of Lien and Warranty Periods: date of City of Winnipeg's acceptance of submitted declaration of Substantial Performance to be date for commencement for warranty period and commencement of lien period unless required otherwise by lien statute of Place of Work.

.7 Final Payment:

.1 When Contract Administrator considers final deficiencies and defects corrected and requirements of Contract met, make application for final payment.

.2 Refer to CCDC 2: when Work deemed incomplete by Contract Administrator, complete outstanding items and request re-inspection.

.8 Payment of Holdback: after issuance of Certificate of Total Performance of Work, submit application for payment of holdback amount in accordance with contractual agreement.

.3 FINAL CLEANING

.1 Clean in accordance with Section 01 74 11 – Cleaning.

END OF SECTION

2.6 CLOSEOUT SUBMITTALS

.1 **DOCUMENTS**

- .1 Operation and maintenance data
- .2 As-built drawings, samples, and specifications.
- .3 Product data, materials and finishes, and related information.
- .4 Warranties.

.2 **RELATED SECTIONS**

- .1 Section 07 31 13 – Asphalt Shingles
- .2 Section 07 52 00 – Modified Bituminous Membrane Roofing.
- .3 Section 07 62 00 – Sheet Metal Flashing and Trim.

.3 **SUBMISSION**

- .1 Prepare instructions and data using personnel experienced in maintenance and operation of described products.
- .2 Copy will be returned after final inspection, with Contract Administrator's comments.
- .3 Revise content of documents as required prior to final submittal.
- .4 Two weeks prior to Substantial Performance of the Work, submit to the Contract Administrator, 1 paper and 1 copy on USB of the operating and maintenance manuals in English.

.4 Ensure spare parts, maintenance materials and special tools provided are new, undamaged or defective, and of same quality and manufacture as products provided in Work

.5 If requested, furnish evidence as to type, source and quality of products provided.

.6 Defective products will be rejected, regardless of previous inspections. Replace products at own expense.

.7 Pay costs of transportation.

.8 **OPERATION AND MAINTENANCE MANUAL FORMAT**

- .1 Organize data as instructional manual
- .2 Binders: vinyl, hard covered, 3 'D' ring, loose leaf 219 x 279 mm with spine and face pockets.
- .3 When multiple binders are used correlate data into related consistent groupings. Identify contents of each binder on spine.
- .4 Cover: identify each binder with type or printed title 'Operations and Maintenance Manuals'; list title of project and identify subject matter of contents.
- .5 Arrange content by process flow, under Section numbers and sequence of Table of Contents.
- .6 Provide tabbed fly-leaf for each separate product and system, with typed description of product and major component parts of equipment.
- .7 Text: manufacturer's printed data, or typewritten data.

.8 Drawings: provide with reinforced punched binder tab. Bind in with text; fold larger drawings to size of text pages.

.9 **CONTENTS – OPERATION AND MAINTENANCE DOCUMENTS**

.1 To Include

.1 Table of Contents:

.2 Provide title of project

.3 Date of submission;

.4 names, addresses, and telephone numbers of Contract Administrator and Contractor with name of responsible parties; an

.5 schedule of products and systems indexed to content of volume.

.2 For each product or system, list names, addresses and telephone numbers of Subcontractors and Suppliers, including local source of supplies and replacement parts.

.3 Product Data: mark each sheet to clearly identify specific products and component parts, and data applicable to installation; delete inapplicable information.

.4 Drawings: supplement product data to illustrate relations of component parts of equipment and systems, to show control and flow diagrams.

.5 Typewritten Text: as required to supplement product data. Provide logical sequence of instructions for each procedure, incorporating manufacturer's instructions specified in Section 01 45 00 - Quality Control.

.6 Testing Reports: copies of testing reports conducted and as specified.

.10 **AS -BUILT DOCUMENTS AND SAMPLES**

.1 In addition to requirements in General Conditions, maintain at the site for Contract Administrator one record copy of:

.1 Contract Drawings.

.2 Specifications.

.3 Addenda.

.4 Change Orders and other modifications to the Contract.

.5 Reviewed shop drawings, product data, and samples.

.6 Field test records.

.7 Inspection certificates.

.8 Manufacturer's certificates.

.2 Store as-built documents and samples in field office apart from documents used for construction. Provide files, racks, and secure storage.

.3 Label as-built documents and file in accordance with Section number listings in List of Contents of this Project Manual. Label each document "AS-BUILT DOCUMENTS" in neat, large, printed letters.

.4 Maintain as-built documents in clean, dry and legible condition. Do not use as-built documents for construction purposes.

.5 Keep as-built documents and samples available for inspection by Contract Administrator.

.11 **RECORDING INFORMATION ON AS-BUILT DOCUMENTS**

.1 Record information on set of black line opaque drawings, and in a copy of the Project Manual, provided by Contract Administrator.

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

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

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

.1 Measured depths of elements of foundation in relation to finish first floor datum.

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

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

.4 Field changes of dimension and detail.

.5 Changes made by change orders.

.6 Details not on original Contract Drawings.

.7 References to related shop drawings and modifications.

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

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

.6 Changes made by Addenda and change orders.

.7 Other Documents: maintain manufacturer's certifications, inspection certifications, field test records, required by individual specifications sections.

.8 Provide digital photos in conformance with Section 01 38 00 Construction Photographs.

.12 MATERIALS AND FINISHES

.1 Building Products, Applied Materials, and Finishes: include product data, with catalogue number, size, composition, and colour and texture designations. Provide information for re-ordering custom manufactured products.

.2 Instructions for cleaning agents and methods, precautions against detrimental agents and methods, and recommended schedule for cleaning and maintenance.

.3 Moisture-protection and Weather-exposed Products: include manufacturer's recommendations for cleaning agents and methods, precautions against detrimental agents and methods, and recommended schedule for cleaning and maintenance.

.4 Additional Requirements: as specified in individual specifications sections.

.13 STORAGE, HANDLING AND PROTECTION

.1 Store spare parts, maintenance materials, and special tools in manner to prevent damage or deterioration.

.2 Store in original and undamaged condition with manufacturer's seal and labels intact.

.3 Store components subject to damage from weather in weatherproof enclosures.

.4 Store paints and freezable materials in a heated and ventilated room.

.5 Remove and replace damaged Products at own expense and to satisfaction of Contract Administrator.

.14 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 principals.

.3 Obtain warranties and bonds, executed in duplicate by Subcontractors, Suppliers, and manufacturers, within ten days after completion of the applicable item of work.

.4 Except for items put into use with City of Winnipeg's permission, leave date of beginning of time of warranty until the Date of Substantial Performance is determined.

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

.6 Co-execute submittals when required.

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

.8 Include a Warranty Management Plan indicating as required reviews, inspections and testing.

END OF SECTION

2.7 DEMOLITION FOR MINOR WORKS

.1 This section specifies requirements for demolishing, salvaging and removing and disposal of waste and debris generated of various items designated to be removed or partially removed to facilitate replacement of roofing, including temporary removal of existing roof mechanical equipment and re-installation.

.1 WASTE MANAGEMENT AND DISPOSAL

.1 Separate waste materials for reuse and recycling in accordance with each specification section.

.2 SITE CONDITIONS

.1 Demolition of spray or trowel applied asbestos can be hazardous to health. Should material resembling spray or trowel-applied asbestos be encountered, stop work and notify Contract Administrator and City of Winnipeg immediately. Do not proceed until written instructions have been received from Contract Administrator.

.2 Notify City of Winnipeg and Contract Administrator before disrupting building access or services.

.3 PREPARATION

.1 Inspect building and site with City of Winnipeg and Contract Administrator and verify extent and location of items designated for removal, disposal, alternative disposal, recycling, salvage and items to remain.

.2 Locate and protect utilities. Preserve active utilities traversing site in operating condition.

.3 Notify and obtain approval of City of Winnipeg & Contract Administrator before starting demolition.

.4 Disconnect, cap, plug or divert, as required, existing public utilities within the property where they interfere with the execution of the work, in conformity with the requirements of the authorities having jurisdiction. Mark the location of these and previously capped or plugged services on the site and indicate location (horizontal and vertical) on the record drawings. Support shore up and maintain pipes and conduits encountered

.5 Immediately notify Contract Administrator and utility company concerned in case of damage to any utility or service, designated to remain in place.

.6 Immediately notify the Engineer should an uncharted utility or service be encountered and await instruction in writing regarding remedial action.

.4 PROTECTION

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

.2 Protect existing items designated to remain and materials designated for salvage. In event of damage to such items, immediately replace or make repairs to approval of Contract Administrator and at no cost to the City of Winnipeg.

.3 Ensure that exposed areas of deck and/or roof are protected, and weather sealed before departing the site each day. Contractor to be responsible for remediation of any areas damaged due to lack of site protection.
.4 Keep noise, dust, and inconvenience to occupants to minimum.
.5 Protect building systems, services and equipment.
.6 Provide temporary dust screens, covers, railings, supports and other protection as required.
.7 Do Work in accordance with Section 01 35 24 – Health and Safety Requirements.

.5 **SALVAGE**

.1 Refer to demolition drawings and specifications for items to be salvaged for reuse.
.2 Remove items to be reused, store as directed by City of Winnipeg and Contract Administrator, and re-install under appropriate section of specification.

.6 **SITE REMOVALS**

.1 Remove items as indicated.
.2 Transport material designated for disposal to approved facilities in accordance with applicable regulations. Make arrangements with and obtain permits from authorities having jurisdiction for disposal of waste and debris.

.7 **DEMOLITION**

.1 Remove parts of existing building to permit new construction. Sort materials into appropriate piles for reuse and recycling.
.2 Trim edges of partially demolished building elements to tolerances as defined by Engineer to suit future use.

.8 **DISPOSAL**

.1 Dispose of removed materials, to appropriate recycling facilities except where specified otherwise, in accordance with authority having jurisdiction.

.9 **ROOF-TOP MECHANICAL & ELECTRICAL EQUIPMENT PROCESS**

.1 Existing mechanical and electrical equipment removal:
  .1 City of Winnipeg's Maintenance Staff (MS) and/or Departmental Representative (DR) shall develop a functional checklist (belts, alignment, current draw, heating and cooling operation, gas-line connections, electrical connections, etc.) for the impacted mechanical and electrical equipment.
  .2 The Contractor will provide five (5) working days' notice when they intend to remove the equipment.
  .3 The Contractor and MS/DR will determine a mutually agreed upon time for equipment functional demonstration and examination.
  .4 MS and/ or Departmental Representative in the presence of the Contractor(s) will demonstrate the operation of the equipment using the previously developed checklist. The Contractor(s) to sign off on the checklist verifying system(s) operation. This will become the in-situ condition of the equipment.

.5 The Contractor may then shut-down and remove/disengage the equipment as required. The contractor shall store the equipment such that it is protected from damage(s).

.2 Re-installation of the existing roof top units (RTU):

.1 Test the RTU for operability using the previously developed check-list as a guidance document.

.2 Contractor to demonstrate equipment operation in the presence of MS and/ or Departmental Representative. MS and/ or Departmental Representative to sign off on the checklist validating system operation.

.3 Contractor to provide a copy of signed documents to City of Winnipeg and Contract Administrator

2.8 METAL FABRICATIONS

.1 General

.2 REQUIREMENTS STEEL ACCESS LADDERS

.1 Construct access ladders as detailed and to comply with all applicable codes and regulations and shop weld connections where possible

.2 Unless detailed otherwise, access ladders shall typically be constructed of 40 I.D. standard steel pipe each side @ 450 o.c. Extend posts to within 75 (3”) of underside of hatch or access point and return posts toward wall at top. Steel rungs to be of 64 wide x 40 high U-shaped, spaced at 300 (12”) o.c. maximum vertically, with the first rung no more than this dimension as well. Leave a minimum gap of 200 (8”) between the face of finished wall and the pipe posts at the top and angle further way at the bottom; weld posts to 40 x 6 bent steel bar brackets at 900 o.c. maximum vertically, with purpose made lag bolts for secure anchoring into wall structure

.3 Unless detailed otherwise, where access ladders occur in areas accessible to the public, provide a 6 (1/4”) thick steel plate cover to fit over the ladder, starting from 300mm AFF to 2100mm AFF, with hinges on one side and a slot through the cover and a hasp welded to the vertical bar post on the other side (future padlock by Owner).

.4 Unless detailed otherwise, at areas above an access ladder and roof hatch, provide an exterior vertical guard in a reversed “U-shape”, constructed of 38mm (1 . ”) O.D. standard steel pipe. This guard shall be aligned with the vertical bar post of the ladder and extend 1000 (39”) minimum above the finished roof surface (plus the roof assembly thickness down to the structural roof deck). At the bottom end of each post of the “U”, weld a 6 (1/4”) thick x 100 x 100 (4”x4”) steel plate, for lag bolting to the structural deck.

.5 Where any access ladder height exceeds 5000 (16’-5”), also provide a steel protection cage on the upper portion of the ladder, starting at 2440 (8’) above the finished floor, to meet all applicable codes and regulations, including ANSI A14.3-2000. Construct this safety cage of steel banding with a minimum 762 (30”) inside clear diameter (measured from the centre of the rung). The banding shall be spaced at 1220 (48”) o.c. maximum horizontally and 230 (9”) o.c. maximum vertically.

.6 All exposed exterior components shall be powder coated, colour to be chosen by Contract Administrator.

.3 SUBMITTALS: NA

.4 REFERENCE STANDARD(S)

.1 American Society for Testing and Materials (ASTM)

.1 ASTM A53/A53M-99b, Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated Welded and Seamless or latest.

.2 ASTM A269-98, Specification for Seamless and Welded Austenitic Stainless Steel Tubing for General Service or latest.

.1 ASTM A307-97, Specification for Carbon Steel Bolts and Studs, 60,000 PSI Tensile Strength or latest.

.3 Canadian General Standards Board (CGSB)

.1 CAN/CGSB-1.40-97, Anti-corrosive Structural Steel Alkyd Primer or latest.

.2 CAN/CGSB-1.108-M89, Bituminous Solvent Type Paint. or latest
.3 CAN/CGSB-1.181-92, Ready-Mixed, Organic Zinc-Rich Coating or latest.

.4 Canadian Standards Association (CSA)
.1 CAN/CSA-G40.20/G40.21-98, General Requirements for Rolled or Welded Structural Quality Steel or latest.
.2 CAN/CSA-G164-M92(R1998), Hot Dip Galvanizing of Irregularly Shaped Articles or latest.
.3 CAN/CSA-S16.1-94, Limit States Design of Steel Structures or latest.
.4 CSA W48.1-M1991(R1998), Carbon Steel Covered Electrodes for Shielded Metal Arc Welding or latest.
.5 CSA W48.2-M1992(R1998), Chromium-Nickel Steel Covered Electrodes for Shielded or latest.
.6 CSA W48.3-M1993(R1998), Low Alloy Steel Covered Electrodes for Shielded Metal Arc Welding or latest.
.7 CSA W48.4-95, Solid Carbon Steel Filler Metals for Gas Shielded Arc Welding
.8 CSA W48.5-M1990(R1996), Carbon Steel Electrodes for Flux- and Metal-Cored Arc Welding or latest
.9 CSA W48.6-96, Fluxes and Carbon Steel Electrodes for Submerged Arc Welding or latest.
.10 CSA W59-M1998, Welded Steel Construction (Metal Arc Welding) or latest

.5 SHOP DRAWINGS
.1 Submit shop drawings in accordance with Submittal Procedures. Indicate materials, core thicknesses, finishes, connections, joints, method of anchorage, number of anchors, supports, reinforcement, details, and accessories.
.2 Shop drawings for Ladder Work of this Section shall meet all applicable codes and regulations and shall bear the signature and seal of a Professional Engineer registered in the same province as the Work

.6 PROTECTION
.1 All materials shall be delivered and stored in their original packaging, in conformance with the requirements described in the Manufacturer’s Manual.
.2 Cover exposed stainless-steel surfaces with pressure sensitive heavy protection paper or strippable plastic coating, before shipping to job site. Leave protective covering in place until final cleaning of building. Provide instructions for removal of protective covering

.7 PRODUCTS
.1 Steel sections, bars, rods, and plates: to CAN/CSA-G40.20/G40.21, Grade 350 W
.2 Steel pipe: to ASTM A53/A53M standard weight, black finish
.3 Welding materials: to CSA W59.
.4 Welding electrodes: to CSA W48 Series.
.5 Bolts and anchor bolts: to ASTM A307.
.6 Bolts and anchor bolts: to ASTM A307
.7 Grout: non-shrink, non-metallic, flowable, 15 MPa at 24 hours.
.8 Sealants: SBS compatible see Section- 07 52 00

.8 MISCELLANEOUS STEEL SECTIONS

.1 Supply all miscellaneous steel angles, plates, brackets, lintels, bars, rods, etc., as indicated and noted on the drawings or as specified. Size to suit required loads. Continuously weld and grind smooth exposed connections. Also refer to drawings for connections and details

.9 FABRICATION

.1 Fabricate work square, true, straight and accurate to required size, with joints closely fitted and properly secured

.2 Use self-tapping, shake-proof, round headed screws on items requiring assembly by screws or as indicated

.3 Where possible, fit and shop assemble work, ready for erection.

.4 Ensure exposed welds are continuous for length of each joint. File or grind exposed welds smooth and flush

.10 FINISHING

.1 Clean all surfaces of rust, scale, grease, and foreign matter, prior to finishing.

.2 When possible, apply coatings in the shop and before assembly. Where size permits, galvanize components after assembly, in accordance with requirements of CSA Standard G164-M1981.

.3 All exposed exterior components shall be powder coated, colour to be chosen by Contract Administrator.

.11 ISOLATION COATING

.1 Isolate aluminum from following components, by means of bituminous paint:

.1 Dissimilar metals except stainless steel, zinc, or white bronze of small area.

.2 Concrete, mortar and masonry.

.12 EXECUTION

.1 ERECTION

.1 Do welding work in accordance with CSA W59 unless specified otherwise.

.2 Erect metalwork square, plumb, straight, and true, accurately fitted, with tight joints and intersections.

.3 Provide suitable means of anchorage acceptable to Contract Administrator such as dowels, anchor clips, bar anchors, expansion bolts and shields, and toggles.

.4 Exposed fastening devices to match finish and be compatible with material through which they pass.

.5 Supply components for building into Work by other sections in accordance with shop drawings and schedule.

.6 Make field connections with bolts to CAN/CSA-S16.1, or weld.

.7 Hand items over for casting into concrete or building into masonry to appropriate trades together with setting templates.

.8 Cut off all sharp edges, corners, burrs, etc. and grind smooth before shop priming.

.9 Touch-up rivets, field welds, bolts and burnt or scratched surfaces in conjunction with powder coating.

.10 Touch-up powder coated materials where burned by field welding.

END OF SECTION

2.9 ROUGH CARPENTRY

.1 RELATED SECTIONS

.1 Section 07 31 13 – Asphalt Shingles.
.2 Section 07 52 00 – Modified Bituminous Membrane Roofing.
.3 Section 07 62 00 – Sheet Metal Flashing and Trim.
.4 Section 07 92 00 – Joint Sealants.

.2 REFERENCES

.1 American Society for Testing and Materials International (ASTM)
  .1 ASTM C167 – 18, Standard Test Methods for Thickness and Density of Blanket or Batt Thermal Insulations.
  .2 ASTM C303 - 10(2016)e1, Standard Test Method for Dimensions and Density of Preformed Block and Board–Type Thermal Insulation.
.2 Canadian Standards Association (CSA International)
  .1 CSA B111-1974(R2003), Wire Nails, Spikes and Staples.
  .2 CSA O80 Series-08 (R2012), Wood Preservatives
  .3 CSA O112.10-08, Evaluation of Adhesives for Structural Wood Products (Limited Moisture Exposure).
  .4 CSA O121-08, Douglas Fir Plywood.
  .5 CSA O141-05(2009), Softwood Lumber.
  .6 CSA O151-09, Canadian Softwood Plywood.
.3 Underwriters Laboratories' of Canada (ULC).
.4 CAN/ULC-S702-14, Standard for Thermal Insulation, Mineral Fibre for Buildings
.5 National Lumber Grades Authority (NLGA)
  .1 Standard Grading Rules for Canadian Lumber.

.3 MEASUREMENT PROCEDURES

.1 No measurement will be made under this section. The Contractor shall include in the appropriate fixed price component all labour, materials, supervision, and equipment as required to complete the work required under this Section and as shown on the Drawings.

.4 QUALITY ASSURANCE

.1 Lumber 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.

.5 DELIVERY, STORAGE, AND HANDLING

.1 Deliver, store and handle materials in accordance with Section 01 61 00 – Common Product Requirements and with manufacturer's written instructions.
.2 Delivery and Acceptance Requirements: deliver materials to site in original factory packaging, labelled with manufacturer's name and address.
.3 Storage and Handling Requirements:
  .1 Store materials off ground in dry location and in accordance with manufacturer's recommendations in clean, dry, well-ventilated area.
  .2 Replace defective or damaged materials with new.

.6 **FRAMING AND STRUCTURAL MATERIALS**

.1 Lumber: softwood, S4S, moisture content 19% (S-dry) or less in accordance with following standards:
- .1 CSA O141.
- .2 NLGA Standard Grading Rules for Canadian Lumber.

.2 Framing and board lumber: in accordance with NBC, except as indicated or specified otherwise.

.3 Furring, blocking, nailing strips, grounds, rough bucks, cants, curbs, fascia backing and sleepers all to be pressure treated:
- .1 S2S is acceptable for interior-protect areas.
- .2 Board sizes: "Standard" or better grade.
- .3 Dimension sizes: "Standard" light framing or better grade.
- .4 Post and timbers sizes: "Standard" or better grade.

.4 Douglas Fir Plywood (DFP): to CSA O121, standard construction.

.5 Metal Angles (break metal):
- .1 Galvanized steel, ASTM A653/A653M Grade 230 with Z275 zinc coating.
- .2 Thickness: Typically, 20-gauge or as shown on Drawings.
- .3 Size: As shown on Drawings.

.7 **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 Glass reinforced sheathing: to ANSI/UL 790.

.8 **ACCESSORIES**

.1 Sealants: DOWSIL 795 Silicone Building Sealant. Colour to match adjacent finish or as selected and approved by City of Winnipeg.

.2 General purpose adhesive: to CSA O112 Series.

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

.4 Bolts: 12.5 mm (1/2``) diameter unless indicated otherwise, complete with nuts and washers.

.5 Proprietary fasteners: toggle bolts, expansion shields and lag bolts, screws and lead or inorganic fibre plugs, recommended for purpose by manufacturer.

.6 Nailing discs: flat caps, minimum 25 mm diameter, minimum 0.4 mm thick, sheet metal, formed to prevent dishing. Bell or cup shapes not acceptable.

.7 Glass reinforced sheathing: paperless, mould and moisture resistant support board combining reinforcing glass mat fully embedded into a specially formulated fire and moisture resistive, non-combustible core.
- .1 Thickness: Typically 5/8” or as indicated on drawings.

.8 Spray-applied polyurethane foam to meet the requirements of ULC S705.1.

.9 Batt and blanket stone wool insulation to CAN/ULC S702.
- .1 Type: 1
- .2 Density: to ASTM C167 (>2 lbs/ft^2)
- .3 Thickness: to be friction-fit into all wall cavities and other areas indicated on the drawings.
- .4 Acceptable product: COMFORTBATT by Rockwool.
  - .1 Semi-rigid stone wool insulation to CAN/ULC S702:

.2 Type: 1
.3 Density: to ASTM C303.
.4 Thickness: to suite wall cavity and as indicated on drawings.

.9 **FASTENER FINISHES**

.1 Hot-dipped galvanizing: use galvanized fasteners for exterior work, interior highly humid areas and pressure-preservative treated lumber.
.2 Stainless steel: use stainless steel where indicated on drawings.

.10 **WOOD PRESERVATIVE**

.1 Preservative Coating: in accordance with manufacturer's recommendations for surface conditions:
.1 CCA or other water-borne salt, free of petroleum solvents and oils, applied by pressure treatment in accordance with CSA O80

.11 **EXAMINATION**

.1 Verification of Conditions: verify conditions of substrates previously installed under other Sections or Contracts are acceptable for product installation in accordance with manufacturer's written instructions.
.1 Visually inspect substrate.
.2 Inform City of Winnipeg and Contract Administrator of unacceptable conditions immediately upon discovery.
.3 Proceed with installation only after unacceptable conditions have been remedied.

.12 **PREPARATION**

.1 Treat surfaces of material with wood preservative, before installation.
.2 Apply preservative by dipping, or by brush to completely saturate and maintain wet film on surface for minimum 3-minute soak on lumber and 1-minute soak on plywood.
.3 Re-treat surfaces exposed by cutting, trimming or boring with liberal brush application of preservative before installation.

.13 **MATERIAL USAGE**

.1 Use pressure-treated wood and treat material when used in the following application:
.1 Wood, fascia backing, blocking, roof curbs, nailers, sleepers on roof deck.
.2 Wood in direct contact with concrete.
.3 Wood furring on outside surface of exterior masonry and concrete walls.
.4 Wood sleepers supporting wood subflooring over concrete slabs in contact with ground or fill.
.2 Exterior wall sheathing:
.1 Douglas Fir Plywood (DFP) sheathing grade, square edge, ½" thick typical or thickness as indicated on drawings.
.2 Interior vertical face of parapets and exterior face of curb wall sheathing
.3 Unless otherwise indicated on drawing details use glass reinforced moisture-resistant support panel.

.14 **INSTALLATION**

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

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

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

.4 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.

.5 Install furring and blocking as required to space-out and support casework, cabinets, wall and ceiling finishes, facings, fascia, soffit, siding, and other work as required.

.6 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 face of furring and blocking to tolerance of 1:600.

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

.8 Install wood fascia backing, nailers, curbs and other wood supports as required and secure using galvanized steel fasteners.

.9 Install sleepers as indicated.

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

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

.12 Patch, finish, re-finish interior finishes removed, cut, broken or damaged resulting from the Work.

.15 **CLEANING**

.1 Progress Cleaning: clean in accordance with Section 01 74 11 – Cleaning.

.1 Leave Work area clean at end of each day.

.2 Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment in accordance with Section 01 74 11 – Cleaning.

.16 **PROTECTION**

.1 Protect installed products and components from damage during construction

.2 Repair damage to adjacent materials caused by rough carpentry installation.

END OF SECTION

2.10 ASPHALT SHINGLES

.1 Granule surfaced asphalt shingle roofing.

.2 Moisture shedding underlayment, eaves, valley and ridge protection.

.3 Associated metal flashing.

.2 RELATED SECTIONS

.1 Section 07 62 00 Sheet Metal Flashing and Trim

.2 Section 07 71 23 Replacement Gutters, Downspouts & Fascia

.3 Section 07 92 00 Joint Sealants

.3 REFERENCES

.1 All references shall be the current version or latest revision at the date of building permit issue:

.2 Canadian General Standards Board (CGSB):

.1 CAN/CGSB 37.5-M89, Cutback Asphalt Plastic Cement.

.3 Canadian Roofing Contractors' Association (CRCA), Roofing Specification Manual.

.1 CRCA Roofing Specification Manual – Latest Edition.

.4 Canadian Standards Association (CSA International).

.1 CAN/CSA-A123.1/A123.5-98, Asphalt Shingles Made from Fibreglass Felt and Surfaced with Mineral Granules/Asphalt Shingles Made from Glass Felt and Surfaced with Mineral Granules.

.2 CAN/CSA-A123.3-98, Asphalt Saturated Organic Roofing Felt.

.3 CAN3-A123.51-M85 (R2001), Asphalt Shingle Application on Roof Slopes 1:3 and Steeper.

.4 CSA B111-1974(R1998), Wire Nails, Spikes and Staples

.5 CAN3-A123.51 - Asphalt Shingle Application on Roof Slopes 1:6 and Steeper.

.6 CAN/CGSB-51.32-M77 - Sheathing, Membrane, Breather Type.

.7 CAN/CGSB 51.34-M86 – Vapour Barrier, Polyethylene Sheet for Use in Building Construction

.8 CAN/ULC-S107 - Methods of Fire Tests of Roof Coverings.

.5 American Society for Testing and Materials (ASTM):

.1 ASTM B209M - Aluminum and Aluminum-Alloy Sheet and Plate.

.2 ASTM B370 - Copper Sheet and Strip for Building Construction.

.3 ASTM D3018/D3018M - Class A Asphalt Shingles Surfaced with Mineral Granules.

.4 ASTM D3161/ D3161M - Test Method for Wind-Resistance of Asphalt Shingles (Fan-Induced Method).

.5 ASTM D3462/D3462M - Asphalt Shingles Made from Glass Felt and Surfaced with Mineral Granules.

.6 Health Canada/Workplace Hazardous Materials Information System (WHMIS)

.7 Manitoba Building Code (MBC) 2006.

.8 Material Safety Data Sheets (MSDS).

.4 SUBMITTALS

.1 Submit product data

.2 Submit product data sheets for asphalt shingles. Include:

.1 Product characteristics.

.2 Performance criteria.

.3 Installation instructions.

.4 Limitations.

.5 Colour and finish.

.3 Indicate specially configured accessories, metal flashings, jointing methods and locations, fastening methods and locations, and installation details.

.4 Submit WHMIS and MSDS (Material Safety Data Sheets). WHMIS acceptable to Health Canada for asphalt shingles.

.5 Samples

.1 Submit samples to Contract Administrator.

.1 Samples: Submit two (2) samples of full size of each fiberglass laminate shingle material of colour and type specified.

.2 Colours are to be selected by Contract Administrator.

.5 DELIVERY, STORAGE & HANDLING

.1 Deliver, handle, store and protect materials

.2 Provide and maintain dry, off-ground weatherproof storage.

.6 **PROJECT ENVIRONMENTAL CONDITIONS**

.1 Anticipate and observe environmental conditions (temperature, humidity and moisture) within limits recommended by manufacturer for optimum results. Do not install products under environment conditions outside manufacturer's limits.

.2 Take special care when applying Waterproofing Shingle Underlayment (WSU) and shingles when ambient or wind chill temperature is below 7 degrees C. Tack WSU in place if it does not adhere immediately to the deck.

.7 **WARRANTY**

.1 Manufacturer's Warranty: Furnish shingle manufacturer's warranty for the product listed below:

.2 Asphalt Laminate Shingle:

.1 Lifetime limited warranty. Manufacturer shall deliver to City of Winnipeg a warranty against defective materials for a period of 40 years.

.3 Warranty Supplement:

.1 Provide manufacturer's supplemental warranty to cover labour and materials in the event of a material defect for the following period after completion of application of shingles:

.4 First Ten Years:

.1 Where a manufacturer's warranty is requested by City of Winnipeg, the Roofing Contractor will supply all materials as required by the manufacturer and install such materials to the acceptance of the manufacturer in order to qualify for the specified warranty.

.2 Correct at Contractor's expense any defects in the Work due to workmanship occurring within a period of Five (5) years from the date of completion of the total Work.

.3 Upon meeting the following: project completion manufacturer acceptance receipt of complete payment by both Contractor and material supplier

.5 Receipt of Contractor's workmanship warranty.

.1 The manufacturer/contractor shall certify compliance with the above guarantee requirements by submitting a copy of the guarantee as a submittal item indicating who will respond to warranty requests and how monitoring will be reported. The manufacturer will advise in writing how to maintain the warranty.

.2 Manufacturer shall deliver to City of Winnipeg a warranty against defective materials for a period of 40 years.

.8 **QUALITY ASSURANCE**

.1 Perform Work in accordance with the CRCA Roofing Specifications Manual. Maintain one (1) copy of document on site.

.2 It is the Contractor's responsibility to take his own on-site measurements.

.3 The Contractor shall provide within five (5) working days, advance notice to the Contract Administrator, for roof inspection and commencement of roof replacement.

.4 All work to be performed in accordance with the manufacturers written instructions and meet or exceed the latest edition of the Manitoba Building Code and industry standard.

.9 **MOCK-UP**

.1 Upon request of Contract Administrator, provide 3000mm x 3000mm (10ft x 10ft) mock-up, including ice dam protection, eave protection, underlayment, shingle installation, and associated flashings.

.2 Mock-up will be used to judge workmanship, substrate preparation, and operation of equipment and material application.

.3 Locate where directed by Contract Administrator.

.4 When accepted, mock-up will demonstrate minimum standard of quality required for this work. Approved mock-up may remain as part of the finished Work.

.10 **UNDERLAYMENT**

.1 Underlayment: ASTM D 226 and ASTM D 4869 synthetic polymer-based scrim reinforced underlayment designed for use on roof decks as a water-resistant layer beneath asphalt shingles, wood shingles, and shakes, metal shingles or slate.

.1 Owens Corning: Deck Defense. Or approved equal in accordance in B7.

.2 Waterproofing Underlayment: ASTM D 1970 sheet barrier of self-adhering rubberized asphalt membrane shingle underlayment having internal reinforcement, and “split” back plastic release film; Use in “low slope’ areas (below 4:12, but no less than 2:12 pitch); provide material warranty with equal in duration to that of shingles being applied

.1 Owens Corning: WeatherLock G.

.2 Ice and Water Shield

.3 Or approved equal in accordance in B7.

.11 **EAVES PROTECTION**

.1 ASTM D1970 sheet barrier of self-adhering rubberized asphalt membrane shingle underlayment having internal reinforcement and “split” back plastic release film; provide material warranty equal in duration to that of shingles being applied.

.1 Owens Corning: WeatherLock G

.2 Or approved equal in accordance with B7.

.12 **ASPHALT FIBREGLASS SHINGLES**

.1 Conforming to ASTM D 3018 Type I – Self-Sealing, UL Certification of ASTM D 3462, ASTM D 3161/UL997 110-mph Wind Resistance and UL Class A Fire Resistance, glass fiber mat base, ceramically colored/UV resistant mineral surface granules across entire face of shingle; algae-resistance; two piece laminate shingle.

.1 Match Existing Kitchen Elevation

.2 Or approved equal.

.3 Colour: To match existing Roof-F1.

.4 Weight: 229 / 240 pounds per square (dependent on manufacturing location) (100 square feet).

.13 **FASTENERS**

.1 Fasteners shall be 12 ga galvanized (zinc coated), with ó" diameter heads long enough to penetrate through plywood deck.

.14 **CEMENT**

.1 Asphalt Modified Roofing Cement meeting the requirements of ASTM D 4586, Type I or II or CAN/CGSB-37.5.

.2 Lap Cement meeting the requirements of D 3019, Non-Asbestos-Fibered, Type III or CAN/CGSB-37.4.A

.3 ASTM D2822, Standard Specification for Asphalt Roof Cement. During cold weather and severe wind, hand sealing is required using flashing cement meeting ASTM D-4586. CAN/CSA-A 123.5 -M90 requires shingles applied in Canada between September 1 and April 30 is adhered with a field applied adhesive as outlined by manufacturer.

.15 **GUTTERS**

.1 Re-use existing.

.16 **METAL FLASHING**

.1 Base and cap flashing shall be a minimum of 26 gauge in thickness. Metal is to be pre-finished and is to be chosen from stock range of Stelco 8000 series of colours.

.1 Or approved equal.

.2 Flashing Fabrication

.1 Form flashing to profiles indicated on Drawings and to protect roofing materials from physical damage and shed water.

.2 Form sections square and accurate to profile, in maximum possible lengths, free from distortion or defects detrimental to appearance or performance.

.17 **ATTIC VENTILATION**

.1 Ventilation at minimum must meet or exceed local building code requirements. Contractor to verify:

.1 Net Free Ventilating Area (NFVA) of 1:150 as a minimum.

.2 Balanced approach for most effective ventilation (balance between the lower and upper parts of the roof by providing 50% of NFVA at the soffit and 50% at the ridge).

.3 NFVA (Net Free Ventilation Area) at the upper part of the roof should not exceed 50%.

.4 Supply and install matching static roof vents.

.18 **ROOF AREAS**

.1 Combined Roof-C & D

.19 **SCOPE OF WORK**

.1 Remove the existing asphalt shingles and underlayment down to existing wood deck and discard to an authorized nuisance ground or recycling facility.

.2 Supply and install new eaves-trough and down-pipes to match existing. Plus provide new at removed canopy including fascia and drip flashings. Supply and install new chimney collars, step flashing, drip and rake edge and counter flashings plus accessories as required.

.3 Supply and install synthetic underlayment as specified. Underlayment to be mechanically fastened.

.4 Supply and install ice and water protector as specified at all penetrations, eaves, valleys and areas denoted on roof plan. (Min. 6’ up from eaves.)

.5 Supply and install the new two-piece laminated fiberglass-based asphalt shingle as specified. Shingles to be mechanically fastened with 6 nails per shingle.

.6 Supply and install new gutter, and downspouts in advised locations as per pre bid site meeting.

.7 Supply and install new metal fascia to match existing North Elevation; on South, East and West Elevations. Ensure metal fascia wraps fully around to back-side of fascia-soffit juncture.

.8 Roof-C&D; deteriorated existing wood fascia and soffit to be replaced with new like -kind.

.9 Deteriorated wood eave, soffit & fascia components to be replaced with new like-kind at the North end of the East Elevation.

.10 Supply and install a sloped saddle on the south side of the hose Tower on the Main Elevation to alleviate ponding and ensure positive drainage. Include full water and ice shield membrane. (Apply layer of compatible mastic under shingles to aid in waterproofing.)

.20 **WORKMANSHIP**

.1 Do not begin installation until the roof deck has been properly prepared. If roof deck preparation is the responsibility of another installer, notify the Contract Administrator of unsatisfactory preparation before proceeding.

.2 The roof deck must be smooth, firm, dry, and securely nailed. Plywood must be exterior grade, conforming to building code requirements. Half-inch plywood is recommended for best deck performance.

.4 Roof slope should be 1:3 or steeper. For slopes 1:3 to 1:6, see special underlayment requirements outlined below. Follow the more stringent of the CAN3 A 123.52 Asphalt Shingle Application on Roof Slopes 1:6 to Less than 1:3 instructions or those of the local building code.

.5 Never apply asphalt shingles to roof slopes less than 2:12.

.21 **APPLICATION**

.1 Follow manufacturer's application instructions and in accordance with local building codes. When local codes and application instructions are in conflict, the more stringent requirements shall take precedence.

.2 Install asphalt shingles on roof slopes in accordance with CAN3 A 123.51-M85 and as per manufacture instructions. Follow whichever method is the more stringent.

.3 Install ice dam protection underlayment directly on plywood at all eaves and roof edges as well as at all penetrations, abutments, and to vertical walls as instructed. Also apply 1-ply of underlayment over the entire deck surface, except where Ice & Water protector membrane has been installed.

.4 Contractor shall support the use of application details as specified by ARMA, NRCA, and CRCA.

.5 Installation of Underlayment

.1 General:

.2 Underlayment are to meet the requirements of one of the following:

.1 ASTM D 226 / D 226M - 09

.2 ASTM D 4869 / D 4869M - 05(2011)

.3 CSA A123.2

.4 CSA A 123.3-05 (R2010)

.5 CAN/CSA A 123.5-05 (R2010)

.6 CAN2 51.32

.3 Install using methods recommended by Manufacturer and in accordance with local building codes. When local codes and application instructions are in conflict, the more stringent requirements shall take precedence.

.4 Install an ice dam protection underlayment of self-adhesive membrane directly on to the plywood at all eaves and roof edges as well as at all penetrations, abutments, and to vertical walls. Add one ply of underlayment over the entire deck surface, except where Ice & Water protector membrane has been installed.

.22 **EAVES**

.1 Install eave protection using methods recommended by Manufacturer and in accordance with local building codes. When local codes and application instructions are in conflict, the more stringent requirements shall take precedence.

.2 Install eaves edge metal flashing tight with fascia boards; lap joints 50 mm (2 inches) and seal with modified-plastic cement; nail at the top of the flange.

.3 Base flashing should be in-place before shingles are applied. Cap flashings of sheet metal and base flashing of metal or mineral surfaced roofing should be used at chimneys, skylights, vents, walls and other vertical surfaces and sealed with asphalt plastic cement. Flashing shall conform to the requirements of applicable building codes and good roofing practice.

.4 Overhang eaves with underlayment by a nominal 6 mm (1/4 inch) minimum and extending up the roof at least 600 mm (24 inches) beyond the interior wall line.

.5 In colder climates where required by codes, and on all roofs with slopes between 2:12 and 4:12 (low slopes), install eaves protection using an Manufacturers membrane product, up the slope from eaves edge a full 900 mm (36 inches) or to at least 600 mm (24 inches) beyond the interior “warm wall”. Lap ends 150 mm (6 inches) and bond.

.6 See Limited Warranty for full details. For areas where the roof slope is 150 mm per 300 mm down to 100 mm per 300 mm (6 inches per foot down to 4 inches per foot), it is strongly recommended to cover the remainder of the deck with one ply asphalt saturated felt (or equivalent) laid parallel to the eaves, with 50 mm (2 inches) horizontal laps and 100 mm (4 inches) end laps. Apply metal drip edges on top of any underlay along rake edges and along eaves.

.23 **VALLEYS**

.1 Install eaves protection at least 900 mm (36 inches) wide and centered on the valley. Lap ends 150 mm (6 inches) and seal.

.2 Where valleys are indicated to be "open valleys", install metal flashing over Ice & Water protector membrane before roof deck underlayment is installed; DO NOT nail through the flashing. Secure the flashing by nailing at 450 mm (18 inches) on center just beyond edge of flashing so that nail heads hold down the edge of the flashing.

.3 Instructions on additional details for valley installations can be found in the ARMA's Residential Asphalt Roofing Manual and/or NRCA's Roofing and Waterproofing Manual.

.24 **ROOF DECK**

.1 Install one layer of roof deck underlayment over the entire area not protected by Ice & Water protector membrane. Install sheets horizontally so water sheds.

.2 On roofs sloped at more 4:12, lap horizontal edges at least 50 mm (2 inches) and at least 50 mm (2 inches) over eaves protection membrane.

.3 On roofs sloped between 2:12 and 4:12, lap horizontal edges at least 480 mm (19 inches) and at least 480 mm (19 inches) over eaves protection membrane.

.4 Lap ends at least 100 mm (4 inches). Stagger end laps of each layer at least 900 mm (36 inches).

.5 Lap underlayment over valley protection at least 150 mm (6 inches).

.25 **PENETRATIONS**

.1 Vent pipes: Install a 600 mm (24 inches) square piece of Ice & Water protector membrane lapping over roof deck underlayment; seal tightly to pipe.

.2 Vertical walls: Install Ice & Water protector membrane for eaves protection extending at least 150 mm (6 inches) up the wall and 300 mm (12 inches) on to the roof surface. Lap the Ice & Water protector membrane over the roof deck underlayment. Sheet metal flashing along the slopes of roof shall be stepped with a minimum of 75 mm (3 inches) head lap in both lower flashing and counter flashing. Where roof slopes downward from wall, flashing shall extend over shingles. Where a roof slopes upward from the wall, flashing shall extend up the slope under the shingles to a point equal in height of 400 mm (15 ¾ inches) to the flashing on masonry. Counter flashing shall be embedded approximately 25 mm (1 inch) into the wall with turn back water stop

.3 Skylights and roof hatches: Install Ice & Water protector membrane from under the built-in counterflashing and 300 mm (12 inches) on to the roof surface, lapping over roof deck underlayment.

.4 Chimneys: Intersection of shingle roofs and masonry walls or chimneys shall be protected using 24 gauge (or better) galvanized sheet metal to extend not less than 150 mm (6 inches) up the wall and 300 mm (12 inches) on to the roof

surface. Lap the Ice & Water protector membrane over the roof deck underlayment.

.5 Rake Edges: Install metal edge flashing over the Ice & Water protector membrane and roof deck underlayment; set tight to rake boards; lap joints at least 50 mm (2 inches) and seal with modified-plastic cement; secure with nails.

.6 Instructions on additional details for sealing Penetrations can be found in the ARMA's Residential Asphalt Roofing Manual and/or NRCA's Roofing and Waterproofing Manual.

.26 **SHINGLES**

.1 General:

.1 Install in accordance with Manufacturer's instructions and local building codes.

.2 When local codes and application instructions are in conflict, the more stringent requirements shall take precedence.

.3 Minimize breakage of shingles in cold weather (below 4°C) by avoiding dropping bundles on edge or by "breaking bundles" over the roof ridge or other bundles. Separating shingles carefully, taking extra precautions in colder temperatures.

.4 Handle shingles carefully in hot weather to avoid scuffing the surfacing or damaging the shingle edges.

.5 Install the asphalt shingles on roof slopes in accordance with CAN3 A 123.51-M85

.6 Installation of Shingles Cover walls and adjacent work where materials hoisted or used.

.2 Placement & Nailing:

.1 Use galvanized (zinc coated) roofing nails, 11 or 12 gauge, with at least 10 mm (3/8 inches) diameter heads, long enough to penetrate through plywood or 20 mm (¾ inches) into boards.

.2 Use six (6) nails per shingle placed in the nail line per Manufacturer's instructions and local codes. Placement of nails varies based on the type of shingle specified, roof slope, and other environmental considerations. Consult the manufacturer's application instructions for the specified shingle for details.

.3 Drive nails straight so that nail head is flush with, but not cutting into shingle surface. Do not overdrive or under drive the nails.

.4 Shingle offset varies based on the type of shingle specified. Consult the application instructions for the specified shingle for details.

.27 **PROTECTION**

.1 Use warning signs and barriers. Maintain in good order until completion of work.

.2 Restore any areas damaged during construction to original condition.

.3 At end of each day's work or when stoppage occurs due to inclement weather, provide protection for completed work and materials. Protect areas of incomplete work.

.4 Protect any areas inside the building when stoppage occurs on roof due to inclement weather.

.5 Do not leave any areas of roof exposed to inclement weather.

.28 **FIELD QUALITY CONTROL**

.1 Quality Control of the work will be provided by QCA Building Envelope Limited. If conditions are unacceptable, QCA will notify the City of Winnipeg.

.2 Employment of inspection/testing agencies does not relax responsibility to perform Work in accordance with Contract Documents & good roofing practices.

.3 If defects are revealed during inspection and/or testing, appointed agency will request additional inspection and/or testing to ascertain full degree of defect. Correct defect and irregularities as advised by Contract Administrator at no cost to City of Winnipeg. Pay costs for retesting and re-inspection.

END OF SECTION

2.11 MODIFIED BITUMINOUS ROOFING

.1 RELATED SECTIONS

.1 Section 06 10 00 – Rough Carpentry
.2 Section 07 62 00 – Sheet Metal Flashing and Trim

.2 REFERENCES

.1 Canadian Roofing Contractors Association (CRCA)
  .1 CRCA Roofing Specifications Manual.
.2 Canadian Standards Association (CSA International)
  .1 CSA A123.21-14, Standard test method for the dynamic wind uplift resistance of membrane-roofing systems.
.3 Roofing System Manufacturer's Warranty, (RSMW)
.4 Abbreviations and Acronyms
  .1 AWPA: American Wood Protection Association; www.awpa.com'
  .2 CCA: Chromated copper arsenate (preservative)
  .3 CRCA: Canadian Roofing Contractors' Association; www.roofingcanada.com.
  .4 EVT: Equiviscous Temperature.
  .5 FBT: Finish Blowing Temperature.
  .6 FM: Factory Mutual Global; www.fmglobal.com.
  .7 FP: Flash Point.
  .8 LTTR: Long Term Thermal Resistance.
  .9 MSDS: Material Safety Data Sheets.
  .10 RCAM: Roofing Contractors Association of Manitoba; www.rcam.ca.
  .11 SBS: Styrene-Butadiene-Styrene.
  .12 SMACNA: Sheet Metal and Air Conditioning Contractors' National Association; www.smacna.org.
  .13 ULC: Underwriters Laboratories of Canada.
.5 Definitions:
.6 Roofing Terminology: Refer to ASTM D1079 and glossary as dictated by CRCA Manual

.3 MEASUREMENT PROCEDURES

.1 No measurement will be made under this section. The Contractor shall include in the appropriate fixed price component all labour, materials, supervision, and equipment as required to complete the work required under this Section and as shown on the Drawings.

.4 ADMINISTRATIVE REQUIREMENTS

.1 Convene pre-installation meeting one week prior to beginning Work, with roofing contractor's representative, the Contract Administrator and the City of Winnipeg to: (This meeting is mandatory and is to be scheduled within five (5) days of mobilization.)
  .1 Verify project requirements.
  .2 Review installation and substrate conditions.
  .3 Co-ordination with other building sub trades.

.4 Review manufacturer's installation instructions and warranty requirements.

.5 CO-ORDINATION AND SCHEDULING

.1 Co-ordinate and complete application forms on behalf of City of Winnipeg for application of Efficiency Manitoba (Building Envelope Program) *To register, contact Efficiency Manitoba at 1-204-944-8181 or visit efficiencymbnetwork.ca*

.6 ACTION AND INFORMATIONAL SUBMITTALS

.1 Provide submittals in accordance with Section 01 33 00 – Submittal Procedures.

.2 Product Data:

.1 Provide two (2) copies of most recent technical roofing components data sheets describing materials' physical properties and include product characteristics, performance criteria, physical size, finish and limitations.

.3 Manufacturer's Certificate: certify that products and system design meet or exceed specified requirements of CSA A 123.21-14, Standard Test Method for Dynamic Wind Uplift Resistance of Membrane-Roofing Systems.

.4 Provide Certification from the manufacturer that the adhesive and/or mechanical anchors utilized in the design and installation exceed the following design live wind loads, which are also listed on drawings.

.1 -0.8 kPa (-17 psf) for the field of the roof.

.2 -1.1(-24 psf) kPa for the edge of the roof.

.3 -2.0 kPa (-41 psf) for the corners of the roof.

.5 Provide shop drawings indicating:

.1 Indicate fastening pattern(s), flashings, counter-flashings, tapered insulation, pre-manufactured flashings, penetrants, roof drainage elements, and details.

.2 Provide layout for tapered insulation. Insulation to provide the minimum slopes indicated on the drawings. At no point less than 2% effective to drains or scuppers. Shop drawing to show the location, direction and identification of all sloped insulation boards.

.6 Closeout Submittals:

.1 Submit in accordance with Section 01 78 00 – Closeout Submittals.

.2 Submit operation and maintenance data for incorporation into manual, including manufacturer’s recommended cleaning instructions for metal components.

.3 Submit Manufacturer’s and contractor’s warranty documentation. Including Warranty Management Plan.

.7 QUALITY ASSURANCE

.1 Roofing Contractors and sub-contractors must, when tendering or performing work, possess a Roofing Contractor operating license.

.2 Roofing Contractors and sub-contractors must also be currently registered with and approved by the product manufacturer.

.3 Only qualified, certified installers employed by a company with the appropriate equipment may execute the roofing work

.4 Roofing Contractors must be members in good standing of Roofing Contractors Association of Manitoba (RCAM) and provide the Contract Administrator with a certificate to this effect before beginning any roof work.

.5 Public bidders who are not members of the Roofing Contractors Association of Manitoba (RCAM) must submit company information and history over the past five (5) years, company resume listing City of Winnipeg(s) and officers and min. three (3) references with the tender forms and documents.

.6 All Bidders must also prequalify as contractors, installers and applicators under the approved roofing systems manufacturers' requirements for installation and warranty.

.7 Contractor may switch roofing foreman through project only upon written permission of Contract Administrator and only after suitable overlap to facilitate transfer of knowledge.

.8 While work is in progress, the contractor shall maintain site supervision under a qualified and experienced roofing trade's supervisor fully capable of acting competently on-site instructions given by the Contract Administrator.

.9 All work specified in which the contractor is not normally employed as a trade contractor shall be performed by competent employee and/or sub-contractor trades personnel fully skilled and qualified in the trade of work to be performed.

.10 Maintain crew size in suitable number at all times to ensure expeditious completion of the work. Notify the Contract Administrator prior to any change(s) in supervision, crew size, work operations and schedule affecting timely completion of the work.

.11 During progress of work Contractor shall submit via email daily work in-progress digital photos to Contract Administrator before days end.

.12 The Contractor shall pay for additional monitoring, inspection(s), testing and related costs deemed necessary by the Contract Administrator for quality assurance and found necessary due to omitted, incomplete, deficient work and or latent distresses.

.8 **FIRE PROTECTION**

.1 Prior to the start of work, conduct a site inspection to make sure that all procedures and proposed changes are approved to minimize the risk of fires.

.2 Respect safety measures described in the Product Manufacturer's Specification Manual as well as local association recommendations, and City of Winnipeg's requirements.

.3 At the end of each workday, use a heat detector gun and/or infrared imaging camera to spot any thermal anomalies associated with smouldering or concealed fire. Job planning must be organized to ensure workers are still on location at least after thermofusible (torch-welding) application(s). (2-hour fire watch). (Qualified FireWatch personnel must be on roof at all times during work day. Eg: lunch break monitor.)

.4 Never apply open-flame directly to old and wood surfaces. Throughout roofing installation, maintain a clean site and have at least one ULC-approved ABC fire extinguisher, charged and in perfect operating condition, within 6 metres of each roofing torch. Respect all safety measures described in technical data sheets. Open-flame must never be placed near combustible or flammable products, nor used where the flame is not visible or cannot be easily controlled.

.5 Fire protection is also to comply with the Hot Work Specification/Policy in the appendix attached to the project specification and Section 01 35 00 Special Procedure. Give precedence to safety and health of public and site personnel and comply to the more stringent fire protection requirements.

.9 **DELIVERY, STORAGE, AND HANDLING**

.1 Deliver, store and handle materials in accordance with manufacturer's written instructions and Section 01 61 00 – Common Product Requirements.

.2 The materials are to remain in their original packaging, displaying the manufacturer's name, product name, weight, and reference standards, as well as all other indications or references considered standard.

.3 Storage and Handling Requirements:

.1 Safety: comply with requirements of Workplace Hazardous Materials Information System (WHMIS) regarding use, handling, storage and disposal of asphalt sealing compounds, primers and caulking materials.

.2 Provide and maintain dry, off-ground weatherproof storage.

.3 Store rolls of membrane in upright position. Store membrane rolls with salvage edge up.

.4 Avoid material overloads (Point-loading) which may affect the structural integrity of specific roof areas.

.5 Remove only in quantities required for same day use.

.6 Place plywood runways over completed Work to enable movement of material and other traffic.

.7 Store sealants at +5 degrees C minimum.

.8 Store insulation protected from daylight, weather and deleterious materials.

.10 **FIELD CONDITIONS**

.1 Do not install roofing when temperature remains below the manufacturer's minimum recommended temperature. For temperatures below this practice cold weather application techniques as recommended by membrane manufacturer.

.2 Minimum temperature for solvent-based adhesive is -5 degrees C.

.3 Install roofing on dry deck, free of snow and ice, use only dry materials and apply only during weather that will not introduce moisture into roofing system.

.11 **WARRANTY**

.1 The membrane manufacturer will issue a written document in the City of Winnipeg's name, valid for a 10-year period, saying that it will repair any leaks in the roofing membrane to restore the roofing system to a dry and watertight condition, to the extent that membrane manufacturing or installation defects caused water infiltration. The warranty must cover for the entire cost of the repair(s) during the entire warranty period. The warranty must be transferable, at no extra cost, to subsequent building City of Winnipeg's. The contractor will issue a written and signed document in the City of Winnipeg's name, certifying that the work executed will remain in place and free of any workmanship defect for a period of five (5) years, starting from the date of acceptance. The warranty certificate must reflect these requirements.

.2 The product manufacturer will issue a written and signed document in the City of Winnipeg's name, certifying that the roofing membranes are free of manufacturing defects for a period of ten 10 years, starting from the date of acceptance. This warranty will cover the removal and replacement of defective roof membrane products, including labour. The warranty must remain a full warranty for the duration of the period specified. The warranty certificate must reflect these requirements.

.3 Provide to City of Winnipeg a written Warranty issued by the Roofing Contractor covering defects in workmanship for a period of five (5) years. The Warranty shall commence on the date of Final Performance of the Work. The Contractor agrees to promptly Make Good any defects which occur or become apparent within the warranty period in conjunction with Manufacturer's Warranty.

.4 Promptly correct any defects or deficiencies which become apparent within labour and/or material warranty period, to satisfaction of Contract Administrator and at no expense to City of Winnipeg.

.5 Respond in a reasonable timely manner upon notification of a defect; otherwise the City of Winnipeg has the right to repair the defect(s) at the Contractor's expense

.6 Engage qualified and approved subcontractor(s) when necessary.

.7 Enforce all warranties for the benefit of the City of Winnipeg.

.8 Provide Communication Status and Written Verification of any warranty repair work.

.12 **PERFORMANCE CRITERIA**

.1 Material Compatibility: Compatibility between components of roofing system is essential. All waterproofing materials are to be provided by the same manufacturer. Provide written declaration to Contract Administrator stating that materials and components, as assembled in system, meet this requirement. Components of roof system to be compatible with adjoining materials under application and service as demonstrated by roofing manufacturer and based on testing and field experience.

.2 Roofing System: to CSA A123.21 for wind uplift resistance, exceeding the above noted design wind loads.

.3 Design roofing membrane system and base flashings to be watertight, does not permit passage of water through finished roof system, and resists exposure to weather without failure.

.4 Compliance with Local, Provincial and Federal Building Codes: Ensure roofing system complies with authorities having jurisdiction over construction covered within scope of this Specification.

.5 A 2-ply SBS modified bitumen roof membrane assembly new polyisocyanurate insulation board set in adhesive min. R30 semi-adhered base sheet COLVENT BASE 830 by Soprema and heat welded granulated cap sheet SOPRAPLY TRAFFIC CAP by Soprema or IKO fully bonded Armourbond base & equal Cap sheet. Or approved equal in accordance with B7. *(Including perimeter restraint SOP-35 or SOP-36)*

.13 **PRIMER**

.1 Primer for self-adhesive membranes:

.1 Composed of SBS synthetic rubber, volatile solvents, adhesive enhancing resins and volatile solvent. Used as primer to enhance the adhesion of self-adhesive membranes. at temperatures above -10°C

.2 Primer for thermofusible membranes:

.1 Made of bitumen, volatile solvents and adhesive enhancing additives. Used as primer to enhance the adhesion of thermofusible waterproofing membranes.

.14 **AIR VAPOUR BARRIER MEMBRANE**

.1 Self-adhesive air/vapour barrier membrane:

.1 Description: Self-adhesive membrane composed of SBS modified bitumen, with a surface screen made of high-density polyethylene laminated between two layers of polyethylene films. The self-adhesive underface is protected with a silicone plastic release film.

.2 Self-adhesive continuity (transition) membrane:

.1 Description: Self-adhered transition membrane with SBS modified bitumen and a tri-laminated woven polyethylene facer. The underside is covered with silicone film.

.15 **PRIMER**

.1 Primer for self-adhesive membranes:

.1 Composed of SBS synthetic rubber, volatile solvents, adhesive enhancing resins and volatile solvent. Used as primer to enhance the adhesion of self-adhesive membranes. at temperatures above -10°C

.2 Primer for thermofusible membranes

.1 Made of bitumen, volatile solvents and adhesive enhancing additives. Used as primer to enhance the adhesion of thermofusible waterproofing membranes.

.16 **AIR VAPOUR BARRIER MEMBRANE**

.1 Self-adhesive air/vapour barrier membrane:

.1 Description: Self-adhesive membrane composed of SBS modified bitumen, with a surface screen made of high-density polyethylene laminated between two layers of polyethylene films. The self-adhesive underface is protected with a silicone plastic release film.

.2 Self-adhesive continuity (transition) membrane:

.1 Description: Self-adhered transition membrane with SBS modified bitumen and a tri-laminated woven polyethylene facer. The underside is covered with silicone film.

.17 **COVER-BOARD**

.1 Glass-Mat Sheathing Roof Board

.1 ¼" (6.4mm)x4(1219mm)'x8'(2438mm) Fibreglass Mat with non-asphaltic coating.

.2 Specified products: Dens Deck Prime Roof-Board by GP

.3 Or approved equal in accordance in B7.

.18 **INSULATION**

.1 Expanded Polystyrene (EPS) HD Type 2 Tapered Insulation

.1 Closed-cell expanded polystyrene foam insulation conforming to CAN/ULC-S701-01, Type 2. Sloped as required to achieve effective drainge indicated on drawings. Min. slope of 2% to roof drains or scuppers, as well as around perimeter and all penetrations. 4% back-slope; crickets with a 3:1 ratio. Below min. 2" Polyisocyanurate insulation.

.2 Drain Sump Basin Slope Set

.1 Closed-cell polyisocyanurate foam core integrally laminated to inorganic coated glass facers. Drain set of 4-way slope to the roof drain, min 4%. *(If market availability does not meet Project Schedule provide for alternate EPS HD Type 2 to meet taper sump requirements for positive drainage.)*

.3 Polyisocyanurate (ISO) Insulation Type III:

.1 Closed-cell polyisocyanurate foam insulation board laminated on both sides with a coated glass fibre facer. These facers shall be saturated with a coating that provides a smooth, consistent surface, free of loose fibres. Insulation thickness and layers as indicated on project drawings. *(If market availability does not meet Project Schedule provide for alternate EPS HD Type 2 to meet effective R30 System Total.)*

.19 **MEMBRANE ROOFING SYSTEM**

.1 Semi-Adhered System

.1 Base sheet: a semi-independent, roofing membrane composed of SBS modified bitumen and a glass mat reinforcement. The surface is covered with a thermofusible plastic film, the underside is covered with a release protection film. The surface must be marked with three (3) chalk lines to ensure proper roll alignment.

.2 Thickness: 4.8 mm (3/16 in)

.3 In conformance with: CAN/CGSB 37.56-M (9th Draft).

	Properties	MD	XD
.1	Strain Energy (kN/M)	**1.8**	**1.2**
.2	Breaking Strength (kN/m)	**12**	**8**
.3	Ultimate Elongation (%)	**15**	**15**
.5	Tear Resistacne (N)	**30**	
.5	Static Puncture Resistance (N)	**160**	
.6	Dimensional Stability (%)	**0**	**0**
.7	Plastic Flow(°C)	**≥ 90**	
.8	Cold Bending at -30°C	**No Cracking**	
.9	Lap Joint Strength (kN/M)	**Pass >4KN/M**	

.4 Specified Product: COLVENT BASE 830 by SOPREMA

.5 Or approved equal in accordance in B7.

.2 Base Sheet Membrane for Flashings and Parapets

.1 Base sheet: Membrane composed of SBS modified bitumen and composite heavy duty reinforcement. The surface is covered with a thermofusible plastic film and the underface is covered with a release protection film. The surface shall be marked with three (3) chalk lines to ensure proper roll alignment

.2 In conformance with: CAN/CGSB 37.56-M (9th Draft).

	Properties	MD	XD
.1	Strain Energy (kN/M)	**7.8**	**7.2**
.2	Breaking Strength (kN/m)	**15**	**13.5**
.3	Ultimate Elongation (%)	**60**	**65**
.5	Tear Resistacne (N)	**125**	
.5	Static Puncture Resistance (N)	**560**	
.6	Dimensional Stability (%)	**0**	**0**
.7	Plastic Flow(°C)	**≥ 90**	
.8	Cold Bending at -30°C	**No Cracking**	
.8	Lap Joint Strength (kN/M)	**Pass >4 KN/M**	

.3 Specified product: SOPRALENE FLAM STICK by SOPREMA

.4 Or approved equal in accordance in B7.

.3 Roofing Cap Sheet Membrane for Field Surfaces

.1 Description: Roofing membrane composed of SBS modified bitumen with a composite reinforcement and elastomeric bitumen with flame-retarding agent. The surface is protected by coloured granules. The underface is covered with a thermofusible plastic film.

.2 In conformance with: CGSB 37.56-M (9th Draft).

	Properties	MD	XD
.1	Strain Energy (kN/M)	**7.8**	**7.2**
.2	Breaking Strength (kN/m)	**15**	**13.5**
.3	Ultimate Elongation (%)	**60**	**65**
.5	Tear Resistacne (N)	**125**	
.5	Static Puncture Resistance (N)	**560**	
.6	Dimensional Stability (%)	**0**	**0**
.7	Plastic Flow(°C)	**≥ 90**	
.8	Cold Bending at -30°C	**No Cracking**	

.9	Lap Joint Strength (kN/M)	**Pass >4 KN/M**

.3 Specified Product: SOPRAPLY TRAFFIC CAP by SOPREMA
.4 Or approved equal in accordance in B7.

.4 Roofing Cap Sheet Membrane for Flashings and Parapet

.1 Description: Roofing membrane composed of SBS modified bitumen with a composite reinforcement and elastomeric bitumen. The surface is protected by coloured granules. The underface is covered with a thermofusible plastic film.

.2 In conformance with: CAN/CGSB 37.56-M (9th Draft).

	Properties	MD	XD
.1	Strain Energy (kN/M)	**7.8**	**7.2**
.2	Breaking Strength (kN/m)	**15**	**13.5**
.3	Ultimate Elongation (%)	**60**	**65**
.5	Tear Resistacne (N)	**125**	
.5	Static Puncture Resistance (N)	**560**	
.6	Dimensional Stability (%)	**0**	**0**
	Plastic Flow(°C)	**≥ 90**	
.8	Cold Bending at -30°C	**No Cracking**	
.9	Lap Joint Strength (kN/M)	**Pass >4 KN/M**	

.3 Specified Product: SOPRAPLY TRAFFIC CAP by SOPREMA
.4 Or approved equal in accordance in B7.

.20 ACCESSORY MEMBRANES

.1 Cover-Strip

.1 Description: Membrane strip 12” made of SBS modified bitumen and composite elastomeric bitumen reinforcement. Both faces are covered with a plastic thermofusible film. The strip ensures water-tightness at the end laps.
.2 In conformance with: ASTM D6162.
.3 Specified product: SOPRALAP by SOPREMA.
.4 Or approved equal in accordance in B7.

.21 FLAME-STOP MEMBRANE

.1 Self-adhered membrane composed of a reinforced glass mat and SBS modified bitumen designed to prevent flames from penetrating into empty spaces and openings while installing heat-welded membranes.
.2 Specified products: SOPRAGUARD tape by SOPREMA.
.3 Or approved equal in accordance in B7.

.22 **ADHESIVES**

.1 Insulation adhesive

.1 Description: Two-component, quick-setting, low-expansion foam urethane adhesive that can be applied at any temperature

.2 Specified product: DUOTACK (365 in cold weather) by SOPREMA.

.3 Or approved equal in accordance in B7.

.23 **FASTENERS**

.1 #14 Phillips pre-assembled hot-dipped galvanized mechanical fasteners made case-hardened carbon steel that comply with FMR approval standards, complete with 2" diameter barbed stress plates that comply with the CSA B35.3.

.2 Round Cap Nails

.1 2.25mm or 38mm (1" or 1 1/2") or approved equal. In compliance with CSA B-111-1974 standard, table 12, nails shall be made of galvanized steel, long enough to penetrate the deck by at least 20mm (3/4") on flashings and parapet walls. DO NOT USE nails to fasten roof assembly panels such as gypsum board or plywood.

.3 Membranes fasteners

.1 #14 self-tapping screws, with washer of 50 mm (2 in) in diameter.

.2 In conformance with: FM 4470 Approvals standard

.3 Specified products: SOPRAFIX FASTENERS/PLATES by SOPREMA.

.4 Or approved equal in accordance in B7.

.24 **SEALERS**

.1 Waterproofing mastic:

.1 SBS mastic applied to finished membrane edges at perimeter metal edges, vent pipes and penetration pockets.

.2 Pitch pocket filler:

.1 Polyester-made precast blocks of various sizes a single-component, polyether-based mastic and a single-component, polyether based sealant and adhesive

.2 Specified product: SOPRAMASTIC BLOCK SYSTEM by SOPREMA.

.3 Or approved equal in accordance in B7.

.3 Sealing product:

.1 Bitumen/polyurethane waterproofing mono-component resin and polyester reinforcements.

.2 Specified products: ALSAN FLASHING and FLASHING REINFORCEMENT by SOPREMA.

.3 Or approved equal in accordance in B7.

.25 **AC CONDESER SUPPORT PADS**

.1 Specified products:

.1 Diversitech 3" UltraLite Lightweight Concrete Equipment Pad with full width plus 3" SBS Traffic Cap Scrim Sheet welded in-place.

.2 Roof Protection Mat (3/4" rubber rooftop support/walk pads with full width plus 3" SBS Traffic Cap welded in-place.)

.3 Or approved equal in accordance in B7.

.26 **PIPE SUPPORTS**:

.1 Rubber blocking with channel supports for roof mechanical/electrical piping/conduits supports made of 100% recycled rubber, UV resistant with 14ga galvanized channel strut. Minimum 5" high. {Welded in-place SBS cap sheet scrim required under each blocking.}

.2 Specified products: Clearline C-ports C-series

.3 Or approved equal in accordance in B7.

.27 **DRAINS**

.1 Aluminum retrofit roof drain, vandal-proof dome with hinged access gate, cast aluminum stabilizer ring, aluminum mounting bolts, pan formed aluminum drain body and straight aluminum outlet deck flange, and EPDM super seal on outlet.

.2 Specified product: OMG Hercules RetroDrain. Drain Stem Length: 12 inches.

.3 Or approved equal in accordance in B7.

.28 **STACK FLASHING**

.1 Spun aluminum pre-manufactured insulated stack flashing consisting of a metal flashing sleeve with integral flange, matching removable cap, pre-molded urethane insulation liner and EPDM Base Seal. Minimum 13" high

.2 Specified product: Thaler SJ-26.

.3 Or approved equal in accordance in B7.

.29 **ROOF WALKWAYS**

.1 Roof walkways are meant to provide roof access to equipment and protect roof membranes from any damage.

.2 Roof Membrane Walkway: Waterproofing membrane composed of SBS modified bitumen and non-woven polyester reinforcement, used to protect membranes subjected to excessive foot traffic. The top face is covered with contrasting colour granules; the underface is protected by a thermofusible plastic film. In conformance with CGSB 37.56-M(9th Draft).

.3 Specified product: SOPRAPLY TRAFFIC CAP by SOPREMA.

.4 Or approved equal in accordance in B7.

.30 **PERIMETER RESTRAINT**

.1 Soprema SOP-35 or SOP-36.

.2 Alternative: Galvanized steel angle, ASTM A653/A653M Grade 230 with Z275 zinc coating. Thickness: 20 Gauge 4"x4"x10'

.31 **QUALITY OF WORK**

.1 Do examination, preparation and roofing work in accordance with Roofing Manufacturer's Specification Manual and CRCA Roofing Specification Manual, particularly for fire safety precautions.

.2 Do not install roofing materials during rain or snowfall.

.32 **SURFACE EXAMINATION**

.1 Surface examination and preparation must be completed in conformance with manufacturer's instructions and recommendations.

.2 Before roofing work begins, the Contract Administrator and Roofing Foreman will inspect and approve deck conditions (including slopes and wood blocking) as well as up-stands and parapets, construction joints, roof drains, plumbing vents, ventilation outlets and others. If necessary, a non-conformity notice will be issued to the contractor so that required corrections can be made. The start of roofing work will mean roofing conditions are acceptable for work completion.

.3 Do not begin any work before surfaces are smooth, dry, and free of ice and debris. Use of calcium or salt is forbidden for ice or snow removal.

.4 Be sure plumbing, carpentry and all other work has been duly completed.

.5 No materials will be installed during rain or snowfall.

.6 Notify Contract Administrator in writing of discrepancies. Commencement of the Work or any parts thereof constitute acceptance of substrate conditions.

.33 PREPARATION

.1 Protect finished work to avoid damage during roof installation and material transportation. Install protective boardwalks over installed roofing materials to enable passage of people and products. Assume full responsibility for any damage. Prevent traffic over completed roofing except where required by work above roof level. Comply with precautions deemed necessary by the Contract Administrator. Repair damage caused by noncompliance with requirements.

.2 Cover walls and adjacent work where materials hoisted or used.

.3 Use warning signs and barriers. Maintain in good order until completion of work.

.4 Clean off drips and smears of adhesive and bituminous material.

.5 Dispose of rainwater off roof and away from face of building until roof drains or hoppers installed and connected.

.6 Remove all existing roofing materials, included membrane residual on existing roof deck. All loose and/or protruding materials to be removed down to existing roof deck with methods suitable to the contractor. As necessary the contractor is to provide the applicable site protection measures.

.7 Prepare surfaces in accordance with manufacturer's written instructions.

.8 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.

.34 METHOD OF INSTALLATION

.1 Pre-conditioning of membranes:

.1 All types of membranes must be fully unrolled 15 minutes prior to installation, no matter of the temperature. Installation of membranes in cold- weather refer to manufactures written cold-weather specifications and recommendations.

.2 When installing self-adhered base sheet membranes in winter conditions, it is advisable to install the cap sheet membrane on the same day as the base sheet.

.35 APPLICATION OF PRIMER

.1 Roofing substrates of wood, metal, concrete, masonry or gypsum board surfaces will receive a coat of asphalt primer at a rate specified in Technical Data Sheets (none required for factory-painted metals). All surfaces to be primed must be free of rust, dust or any residue that may hinder adherence. Cover primed surfaces with roofing membrane as soon as possible (same day coverage for self-adhesive membranes). *Installer: Please refer to Technical Data Sheets for average coverage of specified products*.

.36 **INSTALLATION OF SELF-ADHERED AIR VAPOUR BARRIER MEMBRANE**

.1 Primer must be dry prior installation of the vapour barrier membrane.

.2 Beginning at the bottom of the slope, without adhering the membrane, unroll onto the substrate for alignment. Do not immediately remove the silicone release sheet.

.3 Align the roll parallel to the corrugations of the steel deck. Make sure the membrane overlaps are supported along their entire length.

.4 Peel back one end of the silicone release sheet and adhere this part of the membrane to the substrate. Peel back the remaining release sheet at a 45º angle to avoid wrinkles in the membrane.

.5 Overlap adjacent membranes by 75 mm (3 in). Overlap end laps by 150 mm (6 in). Stagger end laps by at least 300 mm (12 in).

.6 When the vapour barrier is installed directly on the steel deck, place a thin sheet of metal under the end lap of the vapour barrier.

.37 **INSTALLATION OF INSULATION**

.1 Tapered insulation:

.1 Adhere insulation by using specified adhesive in continuous strips spaced 12” on the field surface, 6” on the perimeter, and 4” on corners. Corners and perimeters must be installed as per FM requirements listed in the PLPDS 1-29.

.2 All the boards must be in perfect connection, without any significant differences in level, and must be adhered on all their surfaces completely. If localized mechanical fixings are required to secure insulation due to surface irregularities, they shall be included in the fixed price of the roof installation and the fasteners shall be hot-dipped galvanized No. 12 or 14 screws c/w insulation plates.

.3 All vertical joints between level boards and sloped modules and rows of insulation board will be staggered. *(No soldier fashion.)*

.4 Around the drain, cut out a slight slope of 0 to 10 mm (0 to 0.4 in) in a 600 mm (24 in) radius.

.5 Install only as much insulation as can be covered in the same day.

.6 Install tapered insulation as first insulation layer, in accordance with shop drawings. Stagger joints between layers 150mm (6”) minimum.

.7 Install tapered insulation as first insulation layer, in accordance with shop drawings. Stagger joints between layers 150mm (6”) minimum.

.8 Use largest insulation boards as possible, place boards in parallel rows with ends staggered, and in firm contact with one another.

.9 Use a weighted roller (30-60lb) to ensure continuous contact between insulation layers, adhesive and air/vapour barrier.

.10 At gaps in the insulation, cut and adhere segments of like-kind insulation as required to ensure full continuity in thermal protection assembly. *(Small gaps shall be filled with Fibreglass batt infill.)*

.11 Care shall be taken not to dent or damage top facer of top layer of insulation to receive membrane.

.38 **INSTALLATION OF FLAME-STOP MEMBRANES**

.1 Ensure roofing substrates and adjoining work or construction elements pose no hazards during use of torch equipment. Do not torch onto wood substrates or at locations where chimney or back draft effects could project flames onto concealed combustible materials. Consult membrane manufacturer for alternate work methods where such cases apply.

.2 Install SOPRAGUARD TAPE to details when a torch must be used near combustible materials.

.3 Adhere the membrane directly onto an approved substrate by peeling back the silicone release film. SOPRAGUARD TAPE is designed to prevent flames from penetrating into empty spaces and openings while installing heat-welded membranes.

.4 Unroll the flame-stop membrane onto the insulation without adhering, being careful to overlap adjacent strips to ensure that the flame will not come in contact with the insulation.

.39 **INSTALLATION OF SELF-ADHERED BASE SHEET**

.1 Apply base sheet flashing only after primer coat is dry.

.2 Before applying membranes, always burn the plastic film from the section to be covered if there is an overlap (inside and outside corners and field surface). For sanded base sheet membranes, apply primer for self-adhesive membrane on the area to be covered at the foot of the parapets.

.3 Cut off corners at end laps of areas to be covered by the next roll.

.4 Each selvedge will overlap the previous one along lines provided for this purpose, and by 150 mm (6 in) at the ends.

.5 Position the pre-cut membrane. Remove 150 mm (6 in) of the silicone release film to hold the membrane in place at the top of the parapet.

.6 Then, gradually peel off the remaining silicone release film, pressing down on the membrane with an aluminum applicator to ensure good adhesion. Use the aluminum applicator to ensure a perfect transition between the flashing and the field surface. Smooth the entire membrane surface with a membrane roller for full adhesion.

.7 Install a reinforcing gusset at all inside and outside corners.

.8 Always seal overlaps at the end of the workday.

.9 Avoid the formation of wrinkles, swellings or fish-mouths

.10 Allow the membrane a relaxing period of at least 30 minutes before adhering it, burn the plastic film in a zig-zag fashion using a propane roofing torch to warm & relax it.

.11 Peel back the silicone release paper to adhere the membrane to the substrate. Use a weighted roller to apply even pressure and to ensure good adherence. (Burnishing)

.12 Remove the film protecting the selvedge then heat the side joints. Seal the joints using a hot-trowel or cane. A bleed-line of molten bitumen should appear along the joint to ensure a seal.
.13 Seal the end joints by welding the prescribed cover-strip centered on the joint.
.14 The base sheet membrane should extend to the edge of the filed to up-stand plane allowing fixing of perimeter restraint.

.40 **BASE SHEET FLASHING INSTALLATION (SELF ADHERED)**

.1 Apply base sheet flashing only after primer coat is 'flashed-off'. (Dry-knuckle push-test.)
.2 Before applying membrane, always remove the plastic film on the section to be covered if there is an overlap (inside and outside corners and field surface). For sanded base sheet membranes, apply primer to the area to be covered.
.3 Position the pre-cut membrane piece. Peel back 4" to 6" of the silicone release paper to hold the membrane in place at the top of the parapet.
.4 Then, gradually peel back the remaining silicone release paper, pressing down on the membrane with an aluminum applicator to ensure good adhesion. Use the aluminum applicator to ensure a perfect transition between the up-stand and the field surface. Smooth the entire membrane surface with a hand-roller to promote full contact.
.5 Cut off (45-degree) corners at end laps to be covered by the next roll.
.6 Install a reinforcing gusset at all inside and outside corners.
.7 Always seal overlaps at the end of the workday
.8 Avoid the formation of wrinkles, voids or fish-mouths.
.9 Install round steel-cap nails min. three (3) per 3' section of stripping throughout to aid in securement of SA stripping.

.41 **INSTALLATION OF REINFORCEMENTS**

.1 Install reinforcements specified for various roof surfaces according to the instructions and illustrations found in manufacturer's technical data & guides.

.42 **CAP SHEET INSTALLATION (TORCH-APPLIED MEMBRANE)**

.1 Once base sheet is applied, and no defects are apparent, (Installers ensure all seams are cold probed for apertures.) proceed with cap sheet installation
.2 Begin with double-selvedge starter roll. If starter roll is not used, side laps covered in granules must be degranulated by embedding side laps in torch-heated bitumen over a 4" width.
.3 Starting at drain unroll the cap sheet membrane on the base sheet without adhering, taking care to align the first strip parallel to the edge of the roof.
.4 Weld cap sheet onto base sheet with roofing-torch recommended by membrane manufacturer. During application, simultaneously heat both designated contact surfaces so a uniform flow of bitumen is apparent as cap sheet unrolls
.5 During installation, be careful not to overheat the membrane.
.6 Make sure joints between the two layers are staggered by at least 200mm (12").
.7 Overlap cap sheet side laps by 100mm (4") and end laps by 150mm (6)". Cut off corners at end laps to be covered by next roll. All mateable surfaces must be degranulated.

.8 Complete perfect welds between two membranes. Leave no zone unwelded. In cold weather, adjust welding time to obtain homogenous seam (it may be necessary to slow down in certain cases).
.9 Application to be free of blisters, fish-mouths and wrinkles.
.10 Once cap sheet is installed, carefully check all overlapped joints.
.11 During installation, take care to avoid excessive bitumen bleed-out at joints.
.12 Conserve membrane's appearance. Avoid walking over finished surfaces; use protective walkways as needed.

.43 **HEAT-WELDED CAP SHEETS ON UP-STANDS AND PARAPETS**

.1 This cap sheet must be installed in one-metre-wide strips. The side joints must overlap by 4" and must be staggered by at least 4" with respect to the joints of the cap sheet on the field surface, to avoid areas of excessive membrane thickness. The overlaps on the field surface must be 2" wider than those of the base sheet membrane on the up-stands and parapets. At end laps, angle-cut the corners that will be covered by the following roll.
.2 Use a chalk line to draw a straight line on the field surface 150mm (6") from the up-stands and parapets.
.3 Use a propane roofing-torch and round-nose trowel or de-granulator to embed the surface granules in the layer of hot bitumen starting from the chalk line on the field surface to the bottom edge of the up-stand or parapet as well as on the granulated vertical surfaces that are to be overlapped.
.4 This cap sheet will be heat-welded directly to the base sheet membrane, proceeding from bottom to top. This technique softens both membranes in order to obtain even, continuous weld.
.5 Avoid the formation of wrinkles, voids or fish-mouths.
.6 During installation, be careful not to overheat the membrane or to create excessive bitumen bleeding at the joints.

.44 **MEMBRANE WALKWAY INSTALLATION**

.1 Install membrane walkways respecting requirements previously stipulated for cap sheet installation. Apply primer to cap sheet before installing walkways.

.45 **ROOF PENETRATIONS**

.1 Install roof drain pans, vent stack covers and other roof penetration flashings and seal to membrane in accordance with manufacturer's recommendations and details.

.46 **WATERPROOFING FOR VARIOUS DETAILS**

.1 Install waterproofing membranes in conformance with various roofing details illustrated in the manufacturer's manual instructions and recommendations.

.47 **FIELD QUALITY CONTROL**

.1 Field monitoring of roofing application will be carried out by Contract Administrator.

.2 Monitoring and testing of will be carried out by QCA Building Envelope Limited (QCA) including but not limited to membrane-substrate tensile adhesion testing conducted in general accordance with ASTM D 4541, using a Com-Ten Fastener Tester, cold-probing of seams and membrane airtightness in general accordance with ASTM E 1186.

.3 Presence of third-party monitoring does not alleviate responsibility of Contractor for quality assurance.

.48 **CLEANING**

.1 Remove bituminous markings from finished surfaces.

.2 In areas where finished surfaces are soiled caused by work of this section, consult manufacturer of surfaces for cleaning advice and complying with their documented instructions.

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

.4 Contractor will be responsible for replacement of any stained cap sheet as a result of rust staining and or contamination due to improper protection of cap sheet during metal installation or any other activities. This cost will be borne by the contractor.

END OF SECTION

2.12 SHEET METAL FLASHINGS AND TRIM

.1 RELATED SECTIONS

.1 Section 06 10 00 – Rough Carpentry
.2 Section 07 52 00 – Modified Bituminous Membrane Roofing

.2 REFERENCES

.1 American Society for Testing and Materials International (ASTM)
  .1 ASTM A653/A653M-18, Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process
  .2 ASTM D523-14, Standard Test Method for Specular Gloss.
  .3 ASTM D822/D822M - 13, Standard Practice for Filtered Open-Flame Carbon-Arc Exposures of Paint and Related Coatings.
  .4 ASTM D2244-16 Standard Practice for Calculation of Colour Tolerances and Colour Differences from Instrumentally Measured Colour Coordinates.
  .5 ASTM D2247-15 Standard Practice for Testing Water Resistance of Coatings in 100% Relative Humidity.
  .6 ASTM D2414-18 Standard Test Method for Carbon Black-Oil Absorption Number (OAN).
.2 Canadian Roofing Contractors Association (CRCA) .1 Roofing Specifications Manual
.3 Canadian General Standards Board (CGSB)
  .1 CAN/CGSB-93.1-M85, Sheet Aluminum Alloy, Prefinished, Residential.
.4 SMACNA: Sheet Metal and Air Conditioning Contractors' National Association; www.smacna.org.

.3 MEASUREMENT PROCEDURES

.1 No measurement will be made under this section. The Contractor shall include in the appropriate fixed price component all labour, materials, supervision, and equipment as required to complete the work required under this Section and as shown on the Drawings.

.4 ACTION AND INFORMATIONAL SUBMITTALS

.1 Provide submittals in accordance with Section 01 33 00 – Submittal Procedures.
.2 Submit manufacturer's printed product literature for sheet metal flashing systems materials, specifications and datasheet and include product characteristics, performance criteria, physical size, finish and limitations.
.3 Samples:
  .1 Submit duplicate 1000 x 100mm (4"x4") samples of each type of sheet metal material, finishes and colours.
.4 Quality assurance submittals:
  .1 Manufacturer's Instructions: submit manufacturer's installation instructions and special handling criteria, installation sequence and cleaning procedures.
.5 Closeout Submittals:
  .1 Submit in accordance with Section 01 78 00 – Closeout Submittals.

.2 Submit operation and maintenance data for incorporation into manual, including manufacturer's recommended cleaning instructions for metal components.
.3 Submit Manufacturer's and contractor's warranty documentation.

.5 **PRE-INSTALLATION MEETING**

.1 Convene pre-installation meeting one week prior to beginning work of this Section and on-site installation, with contractor's representative, City of Winnipeg and Contract Administrator to:
.1 Verify project requirements.
.2 Review installation and substrate conditions.
.3 Co-ordination with other building sub-trades.
.4 Review manufacturer's installation instructions and warranty requirements.

.6 **DELIVERY, STORAGE AND HANDLING**

.1 Deliver, store and handle materials in accordance with Section 01 61 00 – Common Product Requirements.
.2 Stack flashings to prevent twisting or bending out of shape.
.3 Prevent contact of flashing materials with corrosive substances.
.4 Damaged materials shall be replaced with new materials.
.5 Handle and store metal flashings so that marring and scratching of the coatings do not occur.

.7 **WARRANTY**

.1 Warranty for flashing assembly free of the following defects: splitting seams, lifting, loosening and undue expansion for five (5) years from date of Substantial Performance.

.8 **SHEET METAL MATERIALS**

.1 Zinc coated steel sheet: thickness as shown on drawings, commercial quality to ASTM A653/A653M, with Z275 designation zinc coating.

.9 **PREFINISHED STEEL SHEET**

.1 Prefinished steel with factory applied silicone modified polyester
.1 Thickness: minimum 24 gauge or as otherwise indicated on drawings and details.
.2 Colour: selected by City of Winnipeg from manufacturer's standard range.
.3 Specular gloss: 30 units +/- 5 in accordance with ASTM D523.
.2 Coating thickness: not less than 25 micrometres.
.3 Resistance to accelerated weathering for chalk rating of 8 in accordance with ASTM D822/D822M.
.4 Resistance to colour fade 5 units or less in accordance with ASTM D2244.
.5 Resistance to humidity after 1000 hours of exposure in accordance with ASTM D2247.

.10 **ACCESSORIES**

.1 Isolation coating: alkali resistant bituminous paint.

.2 Sealants: DOWSIL 795 Silicone Sealant. Colour to match adjacent finish or as selected and approved by City of Winnipeg.

.3 Cleats: of the same materials as the metal designed to secure. Size shall be to suit components to be secured (min 4" (100mm) wide). Gauge shall be sufficient to retain the flashings in place.

.4 Fasteners: as indicated on drawings. No exposed fasteners unless approved by Contract Administrator

.5 Washers: as indicated on drawings.

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

.11 **FABRICATION**

.1 Fabricate metal flashings and other sheet metal work in accordance with applicable CRCA 'FL' series details and as indicated on drawings.

.2 Form pieces in 8' (2438mm) maximum lengths.

.3 Make allowance for expansion at joints.

.4 Hem exposed edges on underside ½" (12mm).

.1 Mitre and seal corners with sealant.

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

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

.12 **METAL FLASHINGS**

.1 Form flashings, trims, copings and fascia, etc. to profiles and thicknesses indicated on drawings.

.2 Butt end joints and provide 150mm (6") backup plates or provide tight fit S-lock or double S-lock.

.3 Each cap flashing to incorporate a 45°, ½" (12mm) hemmed drip edge, unless otherwise noted on drawings.

.13 **DOWNPIPES (RAINWATER LEADERS)**

.1 Form downpipes from prefinished steel sheet metal to profiles and thicknesses indicated on drawings.

.2 Downspout size to be min 100 x 100mm (4" x 4") or as otherwise indicated on drawings.

.3 Downspouts shall not be corrugated.

.4 Downspouts to be closed over first top 760mm (30"), remainder to be open 'C' shape.

.5 Provide drain extensions (min. 6") along base of building to ensure water is carried onto splash pad and away from the building foundation and walls.

.6 Provide goosenecks, outlets, strainer baskets and necessary fastenings.

.7 Precast concrete splash pads: Barkman Concrete pad - 375mm (14.75") wide x 1295mm (51") long x 125mm (5") high.

.14 **SCUPPERS**

.1 Form scuppers, including hopper box, from prefinished steel to profiles and thicknesses indicated on drawingsForm scuppers, including hopper box, from prefinished steel to profiles and thicknesses indicated on drawings.

.2 Scuppers size to be min 300 x 150mm (12" x 6") or as otherwise indicated on drawings.
.3 Install scuppers as indicated and at locations shown on drawings
.4 Provide necessary fastenings and sealant.

.15 **REGLETS**

.1 Form recessed and surface mounted reglets to profiles and thicknesses indicated on drawings, to be built-in concrete or masonry work in accordance with CRCA FL series details and as indicated on drawings
.2 Provide slotted fixing holes and steel/plastic washer fasteners.

.16 **MANUFACTURER'S INSTRUCTIONS**

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

.17 **INSTALLATION**

.1 Install sheet metal work in accordance with CRCA FL series details and as indicated on drawings
.2 Use concealed fastenings, unless otherwise indicated on drawings and where approved before installation.
.3 Counter-flash bituminous flashings at intersections of roof with vertical surfaces and curbs.
.4 Flash joints using butt end joints and backup plates or S-lock forming tight fit over hook strips.
.5 Lock end joints and caulk with sealant. Bond breaker as required
.6 Install surface mounted reglets true and level, and caulk top of reglet with sealant
.7 Turn top edge of flashing into recessed reglet or mortar joint minimum of 25mm (1"). Lead wedge flashing securely into joint and caulk top with sealant
.8 Any through wall flashing shall be installed on 10-degree slope unless noted otherwise
.9 Install pans, where shown around items projecting through roof membrane

.18 **DOWNPIPES (RAIN-WATER LEADERS)**

.1 Form downpipes from prefinished steel sheet metal to profiles and thicknesses indicated on drawings.
.2 Downspout size to be min 100 x 100mm (4" x 4") or as otherwise indicated on drawings.
.3 Downspouts shall not be corrugated.
.4 Downspouts to be closed over first top 760mm (30"), remainder to be open 'C' shape.
.5 Provide drain extensions (min. 6") along base of building to ensure water is carried onto splash pad and away from the building foundation and walls.
.6 Provide goosenecks, outlets, strainer baskets and necessary fastenings.
.7 Precast concrete splash pads: Barkman Concrete pad - 375mm (14.75") wide x 1295mm (51") long x 125mm (5") high.

.19 **FLASHING**

.1 Install starter flashing, drip and other flashing, corners, edgings as required and shown on the drawings.

.20 **CLEANING**

.1 Proceed in accordance with Section 01 74 11 – Cleaning.

.2 On completion and verification of performance of installation, remove surplus materials, excess materials, rubbish, tools and equipment.

.3 Leave work areas clean, free from grease, finger marks and stains.

END OF SECTION

.2 All removed materials shall be removed from the site and all nails or staples picked up with a drag magnet and disposed of at a legal dumpsite on the same day of removal.

.3 Upon the removal of the existing materials, inspect the building structure for dry rot damage or deterioration of existing, fascia boards, trimmers, plates and trusses. Report any rot, defects or unsuitable conditions to Project Manager/City of Winnipeg immediately prior to the installation of any new work.

.1 Upon authorization, remove all rotten, damaged and deteriorated lumber JOINT SEALANTS

.21 **SECTION INCLUDES**

.1 Materials, preparation and application for caulking and sealants.

.2 Text to complete other various Sections containing sealant or caulking specifications, including Section 07 31 00 - Shingle Roofing and 07 46 43 – Composition Siding.

.22 **RELATED SECTIONS**

.1 Section 06 10 00 – Rough Carpentry

.2 Section 07 31 13 – Asphalt Shingles

.3 Section 07 52 00 – Modified Bituminous Membrane Roofing.

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

.23 **REFERENCES**

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

.1 ASTM C321, Standard Test Method for Bond Strength of Chemical-Resistant Mortars.

.2 ASTM C834, Standard Specification for Latex Sealants.

.3 ASTM C882, Standard Test Method for Bond Strength of Epoxy-Resin Systems Used with Concrete by Slant Shear.

.4 ASTM C919, Standard Practice for Use of Sealants in Acoustical Applications.

.5 ASTM C920, Standard Specification for Elastomeric Joint Sealants.

.6 ASTM C1330, Standard Specification for Cylindrical Sealant Backing for use with Cold Liquid Applied Sealants.

.5 Canadian General Standards Board (CGSB)

.1 CAN/CGSB-19.21, Sealing and Bedding Compound Acoustical.

.6 Department of Justice Canada (Jus)

.1 Canadian Environmental Protection Act (CEPA).

.7 Health Canada/Workplace Hazardous Materials Information System (WHMIS)

.1 Material Safety Data Sheets (MSDS).

.8 Transport Canada (TC)

.1 Transportation of Dangerous Goods Act (TDGA).

.24 **SUBMITTALS**

.1 Manufacturer's product to describe.

.1 Caulking compound.

.2 Primers.

.3 Sealing compound, each type, including compatibility when different sealants are in contact with each other.

.4 Installation instructions, surface preparation and product limitations.

.2 Submit duplicate samples of each type of material and colour.

.3 Cured samples of exposed sealants for each color where required to match adjacent material.

.4 Manufacturers' instructions to include installation instructions for each product used.

.25 **QUALITY ASSURANCE**

.1 Manufacturer Qualifications: company engaged in the manufacturing of products specified in this section with a minimum of ten (10) years documented experience.

.2 Applicator Qualifications: Experienced installer equipped and trained for application of joint sealant required for this project with record of successful completion of projects of similar scope.

.1 Applicator to be approved by sealant manufacturer.

.2 Applicator to submit documentation of a minimum three (3) successfully completed projects of similar size, scope and complexity.

.26 **MOCK-UP**

.1 Construct mock-up if requested by Contract Administrator.

.2 Construct mock-up to show location, size, shape and depth of joints complete with back-up material, primer, caulking and sealant. Mock-up may be part of finished work.

.3 Allow two (2) working days for inspection of mock-up by Contract Administrator before proceeding with sealant work.

.4 Mock-up will be used:

.1 To judge workmanship, substrate preparation, operation of equipment and material application.

.5 When accepted, mock-up will demonstrate minimum standard of quality required for this Work.

.27 **FIELD ADHESION/COHESION TESTS**

.1 Test Frequency:

.1 Perform a field test each type of sealant and substrate combination, for all interior and exterior sealants associated with the building envelope & siding.

.2 Perform three (3) additional tests for each failed test.

.2 Locate test joints as directed by Contract Administrator. Tests to be performed in the presence of the Contract Administrator and/or manufacturer's representative.

.3 Notify Contract Administrator seven (7) days prior to dates tests are to be performed.

.4 Test joint sealants by hand-pull methods #1 and # 2. Record test results in Field Adhesion/Cohesion Test Form.

.1 Test Method #1:

.1 Make a knife cut horizontally from one side of the joint to the other.

.2 Make two (2) vertical cuts (from the horizontal cut) approximately 75 mm long on each side of the joint.

.3 Pry out flap created from cuts.

.4 Firmly grasp flap and slowly pull at 90° from sealant plane.

.5 Pull flap until adhesive or cohesive failure occurs.

.1 Adhesive failure will be evidenced by the sealant pulling off clean from the substrate.

.2 Cohesion failure will be evidenced by the sealant ripping or failing within itself, leaving well-adhered sealant to the substrate.

.3 (Cohesive failure is considered a positive result).

.5 Test Method # 2:

.1 Follow steps one (1) through four (4) of Test Method # 1.

.2 Mark a benchmark on the sealant 25 mm (1") from the plane of the installed sealant.

.3 Firmly grasp the flap and pull slowly, while holding a ruler parallel to the sealant flap. Note the position of the benchmark on the ruler.

.4 Refer to manufacturer's printed literature for each sealant tested for the required extension factor pass criteria; (i.e.: if the 25 mm (1") benchmark on the sealant can be pulled to 100 mm (4") and held with no failure of sealant, 400% elongation is achieved.)

.5 If no failure occurs prior to the manufacturer's stated extension factor, the test is successful. Extension factor should be three (3) times the movement capability of the sealant.

.9 Inspect joints for:

.1 Complete fill,

.2 Absence of voids,

.3 Primer,

.4 Proper width/depth ratio, and

.5 Back up material.

.10 Repair sealants pulled in test area by applying new sealants following same procedures used to original seal joints.

.11 Contractor shall repair test areas at no additional cost to Prairie Mountain Health.

.28 **DELIVERY, STORAGE, AND HANDLING**

.1 Deliver, handle, store and protect materials in accordance with contract documents.

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

.3 Condition products to approximately 16 to 20 degrees C for use in accordance with manufacturer's recommendations.

.4 Handle all products with appropriate precautions and care as stated on the Material Safety Data Sheet.

.29 **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˚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.

.30 **SEALANT MATERIALS**

.1 Sealants and Caulking compounds must:

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

.2 Be manufactured and transported in such a manner that all steps for the process, including the disposal of waste products arising therefrom, will meet the requirements of all applicable governmental acts, by laws and regulations including, for facilities located in Canada, the Fisheries Act and the Canadian Environmental Protection Act (CEPA).

.2 Sealant and caulking compounds must not be formulated or manufactured with: aromatic solvents, fibrous talc or asbestos, formaldehyde, halogenated solvents, mercury, lead, cadium, hexavalent chromium, barium or their compounds, except barium sulphate.

.3 Sealant and caulking compounds must no contain a total of volatile organic compound (VOC's) in excess of 100 grams per litre as calculated from records of the amounts of constituents used to make the product.

.4 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.

.5 Do not use caulking that emits strong odours, contains toxic chemicals or is not certified as mould resistant in air handling units.

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

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

.8 Sealants acceptable for use on this project must be listed on CGSB Qualified Products List issued by CGSB Qualification Board for Joint Sealants. Where sealants are qualified with primers use only these primers.

.31 **SEALANT MATERIAL DESIGNATIONS**

.1 Single component, low odor, moisture cure, medium modulus, low VOC sealant for use in sealing air/vapour barrier penetrations, to ASTM C920, Type S, Grade NS, Class 35.

.1 ASTM C719: ± 35%.

.2 Ultimate Elongation: 450 - 550%.

.3 Modulus, 100%: 275 - 345 kPa.

.4 Shore A Hardness: 25 ± 5.

.5 Tensile Strength: 1034 – 1378 kPa.

.6 Maximum VOC: 5 g/L.

.12 Single component, medium modulus, high-performance, neutral-cure silicone sealant for general purpose exterior use, to ASTM C920, Type S, Grade NS, Class 35, Use NT, M, A and O.

.1 ASTM C719: ± 25%.

.2 Ultimate Elongation: 550%.

.3 Modulus, 50% extension: 380 kPa.

.4 Shore A Hardness: 25 ± 5.

.5 Tensile Strength: 1240 kPa.

.6 Maximum VOC: 35 g/L.

.7 Colour to be selected from manufacturer’s standard range.

.3 Single component, low modulus, neutral-cure silicone sealant for general purpose masonry use, to ASTMC920, Type S, Grade NS, Class 50, Use T, NT, M, G, A and O.

.1 ASTM C719: ± 50%.

.2 Ultimate Elongation: 1600%.

.3 Modulus, 50% extension: 193 kPa.

.4 Shore A Hardness: 15.

.5 Tensile Strength: 690 kPa.

.6 Maximum VOC: 22 g/L.

.7 Colour to be selected from manufacturer’s standard range.

.4 Two-component, high modulus, neutral-cure flexible silicone rubber sealant for use with aluminum window and curtain wall fabrication, assembly and glazing installation, to ASTM C1184 and ASTM C920, Type M, Grade NS, Class 12 ½, Use NT.

.1 ASTM C719: ± 25%.

.2 Ultimate Elongation: 120%.

.3 Shore A Hardness: 30 - 40.

.4 Tensile Strength: 2000 kPa.

.5 Maximum VOC: < 18 g/L.

.5 Single component, medium modulus, neutral-cure silicone sealant for general roofing applications, to ASTM C920, Type S, Grade NS, Class 50, Use NT, G, A and O.

.1 ASTM C719: ± 50%.

.2 Shore A Hardness: 35.

.3 Tensile Strength: 415 kPa.

.4 Maximum VOC: 28 g/L.

.5 Colour to be selected from manufacturer's standard range.

.6 Single component, chemical cure, silicone rubber sealant, for use with plumbing fixtures, showers, sinks, tubs, and junction of counter tops and adjacent wall finishes, to ASTM C920, Type S, Grade NS, Class 25, Use NT.

.1 Shore A Hardness: 25.

.2 Tensile Strength: 2100 kPa.

.3 Maximum VOC: 36 g/L.

.4 Colour to be selected from manufacturer's standard range.

.7 Single component, high-performance, elastomeric polyurethane sealant, paintable, for general purpose interior use, to ASTM C920, Type S, Grade NS, Class 35, Use NT, M, A, T, O and I.

.1 ASTM C719: 35%.

.2 Ultimate Elongation: 800%.

.3 Shore A Hardness: 25 - 30.

.4 Tensile Strength: 2400 kPa.

.5 Maximum VOC: 35 g/L.

.6 Colour to be selected from manufacturer's standard range.

.8 Single component, non-skinning, non-hardening, synthetic rubber sealant for use in acoustical applications, to CAN/CGSB 19.21.

.1 Shrinkage: maximum 20%.

.2 Maximum VOC: 53 g/L.

.3 Sag: Maximum 4.0 mm.

.9 Two-component, non-sag, tamper resistant, elastomeric polyurethane sealant, for use in interior joints, penetrations, doors, windows, perimeters of fixtures, where a flexible security sealant is required due to idle tampering or vandalism, to ASTM C920, type M, Grade NS, Class 12.5, Use T_1, M and O.

.1 Ultimate Elongation: 175 - 200%.

.2 Shore A Hardness: 40 - 45.

.3 Tensile Strength: 2000 to 2400 kPa.

.4 Maximum VOC: Activator - < 25 g/L, Base - < 100 g/L.

.5 Colour to be selected from manufacturer's standard range.

.32 **ACCESSORIES**

.1 Primer: Type as recommended by sealant manufacturer. Primer to be compatible with joint forming materials.

.2 Joint Cleaner: Non-corrosive and non-staining type, recommended by sealant manufacturer and compatible with joint forming materials.

.3 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.

.4 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/m^3 density, or neoprene foam backer, size as recommended by manufacturer.

.5 Bond Breaker Tape.

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

.33 **PROTECTION**

.1 Protect installed Work of other trades from staining or contamination.

.34 **SURFACE PREPARATION**

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

.2 Clean bonding joint surfaces of harmful matter substances including dust, rust, oil grease, and other matter which may impair work.

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

.4 Ensure joint surfaces are dry and frost free.

.5 All joint forming materials to be primed prior to sealant installation.

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

.35 **PRIMING**

.1 Where necessary to prevent staining, mask adjacent surfaces prior to priming and caulking.

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

.36 **BACKUP MATERIAL**

.1 Apply bond breaker tape where required to manufacturer's instructions.

.2 Install joint filler to achieve correct joint depth and shape, with approximately 30% compression.

.37 **MIXING**

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

.38 **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 exists to provide neat joint.

.3 Apply sealant in continuous beads.

.4 Apply sealant using gun with proper size nozzle.

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

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

.7 Tool exposed surfaces before skinning begins to give slightly concave shape.(Employ purpose made caulking spatula.)

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

.2 Curing.

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

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

.3 Cleanup.

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

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

.3 Remove masking tape after initial set of sealant.

.39 **CLEANING**

.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