
Bid Opportunity #633-2023

Provision of Partial Roof Replacement at City of Winnipeg
1501 Church Street
Winnipeg, MB



BID OPPORTUNITY FOR: **No. 633-2023**
Provision of Roof Replacement at City of Winnipeg
1501 Church Street
Winnipeg, Mb

DATE: April 16, 2023

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PART A SPECIFICATIONS

1. CONSTRUCTION FACILITIES

1. Allow Consultant 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 Consultant 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. Consultant 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 Consultant 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 Consultant 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 Consultant.

5. **REPORTS**

1. Submit copies of inspection and test reports to City of Winnipeg and Consultant.
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. **TEMPORARY COMMUNICATION FACILITIES**

1. Provide and pay for cellular telephone for site superintendent.

10. **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. 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 Consultant.
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 5-ton 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 Winnipeg 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

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, Consultant 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 Consultant 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 Consultant 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 Consultant at commencement of Work and should it subsequently appear that Work may be delayed for such reason, Consultant 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 Consultant.
8. Touch-up damaged factory finished surfaces to Consultant'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 Consultant in writing, of conflicts between specifications and manufacturer's instructions, so that Consultant 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 Consultant 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 Consultant if required Work is such as to make it impractical to produce required results.
 2. Do not employ anyone unskilled in their required duties. Consultant 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 Consultant, 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 Consultant.
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

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

5. CLOSEOUT PROCEDURES

1. ADMINISTRATIVE REQUIREMENTS

1. Acceptance of Work Procedures:
 1. Notify Consultant in writing of satisfactory completion of Contractor's inspection and submit verification that corrections have been made.
 2. Request Consultant's Review.
2. Consultant's Review:
 1. Consultant 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 Consultant, and Contractor.
 2. When Work incomplete according to Consultant, complete outstanding items and request another review.
5. Declaration of Substantial Performance: when Consultant considers deficiencies and defects corrected and requirements of Contract substantially performed, make application for Certificate of Substantial Performance.
6. Commencement of Lien and Warranty Periods: date of 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 Consultant considers final deficiencies and defects corrected and requirements of Contract met, make application for final payment.
8. Payment of Holdback: after issuance of Certificate of Substantial Performance of Work, submit application for payment of holdback amount in accordance with contractual agreement.

2. FINAL CLEANING

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

END OF SECTION

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 52 00 – Modified Bituminous Membrane Roofing.
2. 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 Consultant'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 Consultant, 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 Consultant and Contractor with name of responsible parties; an 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 Consultant 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 Consultant.

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 Consultant.
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 Consultant.

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

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 Consultant and City of Winnipeg immediately. Do not proceed until written instructions have been received from Consultant.
2. Notify City of Winnipeg and Consultant before disrupting building access or services.

3. PREPARATION

1. Inspect building and site with City of Winnipeg and Consultant 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 utility companies 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 Consultant and utility company concerned in case of damage to any utility or service, designated to remain in place.
6. Immediately notify the Engineer should 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 Consultant 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 Consultant, 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 Consultant.

END OF SECTION

8. ROUGH CARPENTRY

1. RELATED SECTIONS

1. Section 07 52 00 – Modified Bituminous Membrane Roofing.
2. Section 07 62 00 – Sheet Metal Flashing and Trim.

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: Min. 1/2" thick. 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: 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/ft²)
 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 Consultant 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, 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. Supply and install all wood construction such as blocking, studs, parapets, curbs, cant strips, fascia boards or the like as required for new roof.
11. Frame, anchor, fasten, tie and brace members to provide necessary strength and rigidity.
12. Countersink bolts where necessary to provide clearance for other work.
13. 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

9. 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.
 1. ARCA Roofing Application Standards 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. AWWPA: 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 Consultant and the City of Winnipeg 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.

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 www.energycymb.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. -34 psf for the field of the roof.
 2. -41 psf kPa for the edge of the roof.
 3. -72 psf for the corners of the roof.
 4. 4.3 ft. end zone width.
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 field & 4% back-slope 3:1 width-to-length 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. All Bidders must also prequalify as contractors, installers and applicators under the approved roofing systems manufacturers' requirements for installation and warranty.
5. Contractor may switch roofing foreman through project only upon written permission of Consultant and only after suitable overlap to facilitate transfer of knowledge.
6. 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 Consultant.
7. 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.
8. Maintain crew size in suitable number at all times to ensure expeditious completion of the work. Notify the Consultant prior to any change(s) in supervision, crew size, work operations and schedule affecting timely completion of the work.
9. During progress of work Contractor shall submit via email daily work in-progress digital photos to Consultant before days end.
10. The Contractor shall pay for additional monitoring, inspection(s), testing and related costs deemed necessary by the Consultant 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 workday. 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 Owner. 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. The contractor will provide a written and signed document to the City of Winnipeg certifying that the work executed will remain in-place and free of defect for a period of five (5) years from the date of acceptance.
4. Contractor shall provide two (2) minimum as required roof inspections and roof reports as it relates to the Standard Form Warranty at no additional cost to the City of Winnipeg. Promptly correct any defects or deficiencies which become apparent within labour and/or material warranty period, to satisfaction of Consultant 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.

9. Provide Performance Bond throughout the warranty period and warranty extensions.

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 Consultant 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; vapour barrier & support panel, tapered EPS as required, new polyisocyanurate insulation board set in adhesive min. average R28, base sheet panel composed of SBS mod-bit, factory laminated on a HD polyisocyanurate (ISO) insulation support panel and heat welded granulated traffic cap sheet composed of a composite reinforcement & SBS mod-bit. (4.0mm thick) *(Including perimeter restraint SOP-35 or SOP-36 & Perimeter-Picture-Framing Installation method for increased Fire/Flame Safety.)*

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. **Specified Product:** As designated by Membrane Manufacturer.
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.
 2. **Specified Product:** As designated by Membrane Manufacturer.

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. Specified Product: SopraVap'R by Soprema or approved equal in accordance with Section B7.
2. Self-adhesive continuity (transition) membrane:
 1. Description: Waterproofing membrane with composite reinforcement and SBS modified bitumen. The surface is sanded and the underface is self-adhesive and covered with a silicon release film.
 2. Specified Product: Sopraply Stick by Soprema or approved equal in accordance with Section B7.

15. **INSULATION**

1. Expanded Polystyrene (EPS) 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 drainage 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. Specified Product: Plastifab or HW Manufacturing, or approved equal in accordance with Section B7.
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%.
 2. Specified Product Sopra-Iso Plus Hinged Sump, Model 41746 by Soprema or approved equal in accordance with B7.
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 to meet min. R28.

16. **MEMBRANE ROOFING SYSTEM**

1. High-Density Polyisocyanurate Board and Base Sheet Membrane

1. Description: Board composed of SBS modified bitumen membrane with a polyester reinforcement, factory-laminated on a HD polyisocyanurate insulation board. The board measures 0.91 m x 2.44 m (3 ft x 8 ft). The surface is covered with thermofusible plastic film. The membrane side lap is part self-adhesive and part thermofusible.
 2. Thickness: Total 14.9 mm (0.6 in)
 3. In conformance with: CAN/CGSB 37.56-M (9th Draft).
 4. Specified Product: 2-1 Soprasmart ISO HD by Soprema or approved equal in accordance with Section 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).
Specified Product: Sopraply Flamstick by Soprema or approved equal in accordance with Section 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).
Specified Product: Sopraply Traffic Cap by Soprema or approved equal in accordance with Section 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).
 3. Specified Product: Sopraply Traffic Cap by Soprema or approved equal in accordance with Section B7.
17. **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 watertightness at the end laps

2. In conformance with ASTM D6162.
3. Specified Product: Sopralap by Soprema or approved equal in accordance with Section B7.

18. **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 or approved equal in accordance with Section B7.

19. **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 or approved equal in accordance with Section B7.

20. **FASTENERS**

1. #12 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/wallup-stand 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 or approved equal in accordance with Section B7.

21. **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 or approved equal.
3. Sealing Product:

1. Bitumen/polyurethane waterproofing mono-component resin and polyester reinforcements.
 2. Specified products: Alsan Flashing and Flashing Reinforcement by Soprema or approved equal in accordance with Section B7.
 4. Sealing Mastic:
 1. Polyether-based, single-component, water-reactive elastomeric sealing mastic
 2. Specified Product: Sopramastic SP2 by Soprema or approved equal in accordance with Section B7.
22. **PIPE SUPPORTS:**
1. C-Port: C-Series 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.} By Clearline or approved equal in accordance with Section B7.
23. **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. Or approved equal in accordance with Section B7.
 3. New Roof drains: Model No. Z105-N3-ZA-VP, control flow, by Zurn or approved equal in accordance with B7.
 4. Roof Drain pipe extensions; PVC pipe, size to match existing pipe.
 1. Expansion Joint: XJ Series by Fernco Inc. or approved equal in accordance with B7. Check existing drain pipe diameters for size.
 5. Roof drain pipe insulation: 1” Fiberglass, 88 kg/m³ (5-1/2 lb./cu.ft.) density pipe insulation with ASJ jacket, c/w vapour barrier.
24. **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. or approved equal in accordance with Section B7.
25. **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).
Specified Product: Sopraply Traffic Cap by Soprema or approved equal in accordance with Section B7.

26. **PERIMETER RESTRAINT**

1. Soprema SOP-35 or SOP-36 or approved equal in accordance with Section B7.
2. Alternative: Galvanized steel angle, ASTM A653/A653M Grade 230 with Z275 zinc coating. Thickness: 20 Gauge 4"x4"x10'

27. **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.

28. **SURFACE EXAMINATION**

1. Surface examination and preparation must be completed in conformance with manufacturer's instructions and recommendations.
2. Before roofing work begins, the City of Winnipeg's representative 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 Consultant in writing of discrepancies. Commencement of the Work or any parts thereof constitute acceptance of substrate conditions.

29. **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 school division. Repair damage caused by noncompliance with school division's 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.

30. **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.

31. **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.*

32. **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 45° 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.

33. **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) and/or appropriate ballast 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.
 11. Care shall be taken not to dent or damage top facer of top layer of insulation.

34. **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 Fireguard 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. Fireguard 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.

35. **INSTALLATION OF BOARDS and FACTORY LAMINATED BASE SHEET**

1. Adhere support panel using specified adhesive applied 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. Ballast and roll with weighted roller as required to ensure proper contact of mateable substrates and adhesive ribbons.

36. **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. Round cap nails/screws & plates to be installed at minimum six (6) feet in either direction from parapet inside corners to prevent tenting or loss of adhesion of stripping in combination with perimeter restraint.

37. **INSTALLATION OF REINFORCEMENTS**

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

38. **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.

39. **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.

40. **MEMBRANE WALKWAY INSTALLATION**

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

41. **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.

42. **WATERPROOFING FOR VARIOUS DETAILS**

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

43. **FIELD QUALITY CONTROL**

1. Field monitoring of roofing application will be carried out by Consultant.
2. Monitoring and testing of will be carried out by JDB Consulting Inc (JDB) 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.

44. **WORK TASK QUALITY ASSURANCE**

1. For each work task, the Contractor's Superintendent or a qualified supervisor performs an initial work in process inspection when the first representative portion of a work activity is completed.
2. The Superintendent or a qualified inspector performs ongoing work in process quality inspections to ensure that work activities continue to conform to project quality requirements.

3. For each work task, the Contractor's Superintendent or a qualified supervisor inspects the completion of each work task to verify that work conforms to project quality requirements.
4. Completion quality inspections are performed for each work task. Completion quality inspections are conducted before starting other work activities that may interfere with an inspection.
5. Any outstanding punch items remaining after the work task completion inspection is deemed a nonconformance.

45. **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.

END OF SECTION

10. 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 Consultant 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 two (2) 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 or approved equal in accordance with B7. 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 Consultant
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 (RAIN WATER LEADERS)**

1. NA

14. **SCUPPERS**

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

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

11. JOINT SEALANTS

1. 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.

2. RELATED SECTIONS

1. Section 07 52 00 – Modified Bituminous Membrane Roofing
2. Section 07 62 00 – Sheetmetal Flashing & Trim

3. 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.
2. Canadian General Standards Board (CGSB)
 1. CAN/CGSB-19.21, Sealing and Bedding Compound Acoustical.
3. Department of Justice Canada (Jus)
 1. Canadian Environmental Protection Act (CEPA).
4. Health Canada/Workplace Hazardous Materials Information System (WHMIS)
 1. Material Safety Data Sheets (MSDS).
5. Transport Canada (TC)
 1. Transportation of Dangerous Goods Act (TDGA).

4. 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.

5. **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.

6. **MOCK-UP**

- .1 Construct mock-up in accordance with Section 01 45 00 - Quality Control.
- .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.

7. **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.
6. Inspect joints for:
 1. Complete fill,
 2. Absence of voids,
 3. Primer,
 4. Proper width/depth ratio, and
 5. Back up material.
7. Repair sealants pulled in test area by applying new sealants following same procedures used to original seal joints.
8. Contractor shall repair test areas at no additional cost to Prairie Mountain Health.
8. **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.
9. **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.

10. **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, cadmium, hexavalent chromium, barium or their compounds, except barium sulphate.

.3 Sealant and caulking compounds must not 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.

11. **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: $\pm 35\%$.
 - .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.
9. 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: $\pm 25\%$.
 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 ASTM C920, Type S, Grade NS, Class 50, Use T, NT, M, G, A and O.
- .1 ASTM C719: $\pm 50\%$.
 - .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 T₁, 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.

12. **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/m³ 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.

13. **PROTECTION**

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

14. **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.

15. **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.

16. **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.

17. **MIXING**

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

18. **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.

19. **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