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Part 1 General

1.1 CONSTRUCTION PROGRESS SCHEDULE

- .1 Schedule and execute work with least possible interference or disturbance to the normal use of premises and as follows:
 - .1 Complete work within 8 weeks of contract award.
- .2 Carry out work during "regular hour", Monday to Friday from 07:00 to 18:00 hours and on Saturdays, Sundays and statutory holidays.
- .3 Give the Client 48 hours notice for work to be carried out during "off hours".

1.2 SUBMITTAL PROCEDURES

- .1 Submit promptly to Consultant submittals listed for review, in orderly sequence to not cause delay in work.
- .2 Do not proceed with work affected by submittals until review is complete.
- .3 Product Data:
 - .1 Submit five (5) copies of product data: manufacturers catalogue sheets, brochures, literature, performance charts and diagrams, used to illustrate standard manufactured products.
 - .2 Cross reference product data information to applicable portions on Contract Documents.
- .4 Samples:
 - .1 Submit samples: examples of materials, equipment, quality, finishes and workmanship.
 - .2 Where colour, pattern or texture is criterion, submit full range of samples.
 - .3 Reviewed and accepted samples will become standard of material and workmanship, against which installed work will be verified.
- .5 Submit photographs of surrounding properties, objects and structures liable to be damaged or be the subject of subsequent claims.

1.3 REGULATORY REQUIREMENTS

- .1 References and Codes:
 - .1 Materials shall be new and work shall conform to the minimum applicable standards of the "References" indicated in the specification sections, the National Building Code of Canada 2005 (NBC) and all applicable Provincial and Municipal codes. In the case of conflict or discrepancy the most stringent requirement shall apply.
- .2 Building Smoking Environment:
 - .1 Smoking is not permitted in the Building. Obey smoking restrictions on building property.

1.4 FIRE SAFETY REQUIREMENTS

- .1 Comply with both the National Building Code of Canada 2005 and the National Fire Code of Canada 2005 for safety of persons in buildings in the event of a fire and the protection of buildings from the effects of fire, as follows;
 - .1 The National Building Code (NBC): for fire safety and fire protection features that are required to be incorporated in a building during construction.
 - .2 The National Fire Code (NFC):
 - .1 The on-going maintenance and use of the fire safety and fire protection features incorporated in buildings.
 - .2 The conduct of activities that might cause fire hazards in and around buildings.
 - .3 Limitations on hazardous contents in and around buildings.
 - .4 The establishment of fire safety plans.
 - .5 Fire safety at construction and demolition sites.
- .2 Comply with Human Resources and Skills Development Canada (HRSDC), Fire Commissioner of Canada Standards:
 - .1 FC 301, Standard for Construction Operations, June 1982 - Standards
 - .2 FC 302, Standard for Welding and Cutting, June 1982 - Standards
 - .3 FC 374, Fire Protection Standard for General Storage (Indoor and Outdoor), September 1994 - Standards
 - .4 Retain all fire safety documents and standards on site.

1.5 QUALITY CONTROL

- .1 Testing Laboratory Services:
 - .1 Consultant will appoint and pay for costs of inspection and testing services, unless indicated otherwise.
 - .2 Provide safe working areas and assist with testing procedures, including provisions for materials or services and co-ordination, as required by testing agency and as authorized by Consultant.
 - .3 Where tests indicate non-compliance with specifications, contractor to pay for initial test and all subsequent testing of work to verify acceptability of corrected work.

1.6 HAZARDOUS MATERIALS

- .1 Hazardous Materials: product, substance, or organism that may cause adverse impact to environment or adversely affect health of persons, animals, or plant life when released into the environment.
- .2 Comply with the requirements of the Workplace Hazardous Materials Information System (WHMIS) regarding use, handling, storage, and disposal of hazardous materials; and regarding labelling and the provision of Material Safety Data Sheets (MSDS) acceptable to Human Resources and Skills Development Canada (HRSDC), Labour Program.

1.7 MINIMUM STANDARDS

- .1 Materials shall be new, and work conform to, or exceed, the minimum applicable standards of Canadian General Standards Board (CGSB), the Canadian Standards Association (CSA) or the National Building Code of Canada. Latest edition at Tender closing date, and the most stringent conditions apply.

1.8 TEMPORARY UTILITIES

- .1 Existing services required for work, excluding power required for space temporary heating, may be used by the Contractor without charge. Ensure capacity is adequate prior to imposing additional loads. Connect and disconnect at own expense and responsibility.
- .2 Notify the Consultant and utility companies of intended interruption of services and obtain requisite permission.
- .3 Give the Consultant 48 hours notice related to each necessary interruption of any mechanical or electrical service throughout the course of the work. Keep duration of these interruptions to a minimum. Carry out all interruptions after normal working hours of the occupants, preferably on weekends.

1.9 CONSTRUCTION FACILITIES

- .1 Access Scaffold:
 - .1 Scaffolding: in accordance with CSA Z797-09 – Code of Practice for Access Scaffold.
 - .2 Provide design drawings, signed and sealed by qualified Professional Engineer licensed in the province of Ontario, where prescribed.
 - .3 Additions or modifications to scaffolding must be approved by Professional Engineer in writing.
- .2 Site Storage:
 - .1 The Consultant will assign storage space that shall be equipped and maintained by the Contractor.
 - .2 Do not unreasonably encumber site with materials or equipment.
 - .3 Move stored products or equipment that interfere with operations of Consultant or other contractors.
 - .4 Obtain and pay for use of additional storage or work areas needed for operations.
 - .5 Do not load or permit to load any part of work with weight or force that will endanger work.
- .3 Where security is reduced by work provide temporary means to maintain security.
- .4 Sanitary facilities for Contractor's personnel are to be provided by Contractor. Keep facilities clean and in an odor free condition.
- .5 Signage:
 - .1 Provide common-use signs related to traffic control, information, instruction, use of equipment, public safety devices, etcetera, in both official languages or by the use of commonly understood graphic symbols and to approval of the Consultant.
 - .2 No advertising will be permitted on this project.
 - .3 Maintain approved signs and notices in good condition for duration of project and dispose of off site, on completion of project or earlier, as directed by Consultant.

1.10 TEMPORARY BARRIERS AND ENCLOSURES

- .1 Maintain existing services to building and provide for personnel and vehicle access.
- .2 Weather Enclosures: protect work temporarily until permanent enclosures completed.

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

.4 Protection:

- .1 Protect work against damage until take-over.
- .2 Protect adjacent work against the spread of dust and dirt beyond the work areas.
- .3 Protect operatives and other users of site from all hazards.

1.11 COMMON PRODUCT REQUIREMENTS

.1 Quality of Work:

- .1 Carry out work using qualified licenced workers or apprentices in accordance with Provincial Act respecting manpower vocational training and qualification.
- .2 Permit employees registered in Provincial apprenticeship program to perform specific tasks only if under direct supervision of qualified licenced workers.
- .3 Determine permitted activities and tasks by apprentices, based on level of training attended and demonstration of ability to perform specific duties.

.2 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.
- .2 Store packaged or bundled products in original and undamaged condition with manufacturer's seal and labels intact. Do not remove packaging or bundling until required in work.

.3 Manufacturer's Instructions: 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

1.12 EXAMINATION and PREPARATION

.1 Examine site and conditions likely to affect work and be familiar and conversant with existing conditions.

.2 Before commencing work, establish location and extent of services lines in area of work and notify Consultant of findings.

1.13 EXECUTION

.1 Cut, Patch and Make Good:

- .1 Cut existing surfaces as required to accommodate new work.
- .2 Remove all items so shown or specified.
- .3 Patch and make good surfaces cut, damaged or disturbed, to Consultant's approval. Match existing material, colour, finish and texture.

1.14 DEMOLITION

.1 Unless otherwise specified, materials for removal become the Contractor's property and shall be taken from site.

.2 Maintain work area and site, free of accumulated waste and rubbish and dispose of all debris on a daily basis with minimum disturbance to occupants.

- .3 Provide garbage bins and chutes for daily disposal of debris. Co-ordinate location of bins with Consultant prior to commencement of work.
- .4 Have full garbage bins removed immediately. Unless otherwise specified, removed materials will become the Contractors property and shall be taken from site and disposed of in accordance with Municipal, Provincial and Federal regulations.

1.15 CLEANING

- .1 Clean up as work progresses. At the end of each work period, and more often if ordered by the Consultant, remove debris from site, neatly stack material for use, and clean up generally.
- .2 Upon completion remove scaffolding, temporary protection and surplus materials. Make good defects noted at this stage.
- .3 Clean areas under contract to a condition equal to what previously existed and to approval of Consultant.

1.16 COST BREAKDOWN

- .1 Before submitting first progress claim, submit breakdown of Contract Amount in detail as directed by Consultant and aggregating the Contract Amount. After approval by Consultant cost breakdown will be used as the basis of progress payments.

1.17 PRECEDENCE

- .1 Division 01 Sections take precedence over technical specification sections in other Divisions of this Project Manual

Part 2 Products

2.1 NOT USED

- .1 Not used.

Part 3 Execution

3.1 NOT USED

- .1 Not used.

END OF SECTION

Part 1 General

1.1 RELATED WORK SPECIFIED ELSEWHERE

- .1 Supplementary General Conditions of Contract
- .2 Section 07 52 00 - Modified Bituminous Membrane Roofing
- .3 Section 07 62 00 - Metal Flashing and Trim

1.2 GENERAL

- .1 Provide wood blocking and sheathing for roofing and sheet metal work as indicated on the drawings or as required to complete the roof installation.

1.3 REFERENCES

- .1 ASTM International
 - .1 ASTM A 123-12, Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products.
 - .2 ASTM A 653/A 653M-11, Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
- .2 CSA International
 - .1 CSA B111-1974(R2003), Wire Nails, Spikes and Staples.
 - .2 CSA O141-05(R2009), Softwood Lumber.
 - .3 CSA O325-07(R2012), Construction Sheathing.
 - .4 CSA Z809-08, Sustainable Forest Management.
- .3 Health Canada/Workplace Hazardous Materials Information System (WHMIS)
 - .1 Material Safety Data Sheets (MSDS).
- .4 National Lumber Grades Authority (NLGA)
 - .1 Standard Grading Rules for Canadian Lumber 2010.

1.4 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Submit in accordance with Section 01 33 00 - Submittal Procedures.

1.5 PRECAUTIONS

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

1.6 QUALITY ASSURANCE

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

1.7 ANCHORS AND FASTENERS

- .1 Co-ordinate the location and installation of anchors and fasteners. Confirm types of fasteners to be utilized with Consultant.
- .2 Do not use metals in combination that will set up electrolytic action.
- .3 Use non-corrosive or galvanized steel fastenings, as approved by Consultant, or as otherwise specified.
- .4 Space anchors within load bearing or shear capacity.

Part 2 Products

2.1 LUMBER MATERIAL

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

2.2 PANEL MATERIALS

- .1 Canadian softwood plywood (CSP): to CSA O151, standard construction.
 - .1 Urea-formaldehyde free.
 - .2 CAN/CSA-Z809 or FSC or SFI certified.
- .2 Cementitious Fiber-Mat Reinforced Sheathing: ASTM C 1325, ANSI A118.9, cementitious backer. 12mm Cement Board. Standard of Acceptance shall be Durock by USG or Approved equal and shall be approved in writing as a suitable substrate for torching applications by membrane manufacturer.

2.3 ACCESSORIES

- .1 Nails, spikes and staples: to CSA B111 for exterior work.
- .2 For sheathing, use #9 screws with Robertson or Philips head, complete with discs or specified adhesives. For blocking, use screws of sufficient length to penetrate second member a minimum of 38mm. To steel use self-tapping screws. Use lead or in-organic fibre plugs with specified screws in concrete or masonry units. Use expansion shields, friction fit pins or lag bolts in concrete.

2.4 FINISHES

- .1 Galvanizing: to ASTM A 123/A 123M, use galvanized fasteners for exterior work.

Part 3 Execution

3.1 INSTALLATION

- .1 Comply with requirements of NBC, supplemented by the following paragraphs.
- .2 Install furring and blocking as required to support roofing, sheet metal and other work as required.
- .3 Align and plumb faces of furring and blocking to tolerance of 1:200.
- .4 Install rough bucks, nailers and linings to rough openings as required to provide backing for frames and other work.
- .5 Install wood fascia backing, nailers, curbs and other wood supports as required and secure using galvanized fasteners.
- .6 Secure to substrate with specified fasteners, galvanized, minimum 9mm diameter of a suitable length, placed in 2 rows, with each row spaced at 600mm on centres or as otherwise detailed. In concrete, fastener shall penetrate a minimum of 38mm and drill hole shall be 13mm deeper than fastener penetration. Secure blocking to concrete block substrates with specified fasteners, galvanized, minimum 9mm diameter of a suitable length, placed in 2 staggered rows, with each row spaced at 300mm on centres or as otherwise detailed.
- .7 Double the amount of fasteners required for a distance of 2.4m from all outside corners.

3.2 SHEATHING INSTALLATION

- .1 Cement Board
 - .1 Install sheathing to interior of curbs, as indicated on the drawings and details.
 - .2 At all vertical joints and changes in plane, tape to prevent flames reaching underlying substrate.
- .2 Plywood
 - .1 Plywood sheathing shall be installed with all edges supported and placed so that the surface grain is perpendicular to the framing members.
 - .2 Not less than 2mm gaps shall be provided between sheets, to allow for material expansion.
 - .3 Fasten plywood with a minimum of thirty six fasteners per 1200mm x 2400mm sheet.

3.3 ERECTION

- .1 Frame, anchor, fasten, tie and brace members to provide necessary strength and rigidity.
- .2 Countersink screws where necessary to provide clearance for other work.
- .3 All nails shall be long enough so that not less than half their length penetrates into the second member. Splitting of wood members shall be minimized by staggering the nails in the direction of the grain and by keeping nails well in from the edges.

END OF SECTION

Part 1 General

1.1 RELATED REQUIREMENTS

- .1 Supplementary General Conditions of Contract
- .2 Section 06 10 00.01 - Rough Carpentry.
- .3 Section 07 62 00 - Sheet Metal Flashing and Trim.
- .4 Section 15 40 00 - Mechanical

1.2 GENERAL

- .1 Provide the necessary labour and materials to complete the removal of the existing roofing system, sheet metal flashings and membrane down to the existing structural deck and install new roofing system as specified herein. Do roofing work in accordance with applicable standards herein and supplemented with the Canadian Roofing Contractors Association (CRCA) roofing specifications manual.
- .2 The new system shall be as follows and as specified in the areas indicated on the drawings.

The Typical Roof Assembly shall be:

6mm Asphalt Core Board (Dining Room Roof Only)
Vapour Barrier
75mm Rigid Insulation
6mm Asphalt Core Board
2 Ply Modified Bitumen Membrane

- .3 Supply all labour and materials necessary to complete the new two ply Modified Bitumen Membrane Flashings, as specified and detailed in the areas indicated on the drawings.
- .4 Examine all surfaces to receive new roof assembly, and if corrective measures are necessary, report items to Consultant in writing. Substrate shall be smooth, clean, dry and free from depressions or sharp edges. All required wood blocking and curbs shall be securely in place prior to start of roofing work. Notify the Consultant, in writing, prior to commencing contracted work, should corrective measures be required.
- .5 Examine drawings and existing conditions, provide for all vents, curbs, stacks roof mounted equipment curbs, and other openings through membrane roofing.
- .6 Cut and remove landing section of fire escape to facilitate construction of the upper roof area. Reinstall by welding/adding steel plate support as specified herein and complete with cleaning and 2 coat paint application of entire steel fire escape.
- .7 Remove and reinstall sufficient existing lightning protection components to allow safe and proper installation of roofing materials. Reinstall in accordance with CAN/CSA-B72-M87(R2013), installation code for Lightning Protection Systems.

1.3 REFERENCES

- .1 ASTM International Inc.
 - .1 ASTM C 1177/C 1177M-08, Standard Specification for Glass Mat Gypsum Substrate for Use as Sheathing.

- .2 ASTM D 41/D 41M-11, Standard Specification for Asphalt Primer Used in Roofing, Dampproofing, and Waterproofing.
- .3 ASTM D 6162-00a(2008), Standard Specification for Styrene Butadiene Styrene (SBS) Modified Bituminous Sheet Materials Using a Combination of Polyester and Glass Fibre Reinforcements.
- .2 Canadian General Standards Board (CGSB)
 - .1 CGSB 37-GP-9Ma-83, Primer, Asphalt, Unfilled, for Asphalt Roofing, Dampproofing and Waterproofing.
 - .2 CGSB 37-GP-56M, Membrane, Modified, Bituminous, Prefabricated, and Reinforced for Roofing.
- .3 Canadian Roofing Contractors Association (CRCA)
 - .1 CRCA Roofing Specifications Manual-2011.
- .4 Canadian Standards Association (CSA International)
 - .1 CSA A123.21-04, Standard Test Method for the Dynamic Wind Uplift Resistance of Mechanically Attached Membrane-Roofing Systems.
- .5 Health Canada / Workplace Hazardous Materials Information System (WHMIS)
 - .1 Material Safety Data Sheets (MSDS).
- .6 Underwriters Laboratories' of Canada (ULC)
 - .1 CAN/ULC-S704-11, Standard for Thermal Insulation, Polyurethane and Polyisocyanurate Boards, Faced.

1.4 ADMINISTRATIVE REQUIREMENTS

- .1 Convene pre-installation meeting one week prior to beginning waterproofing Work, with Consultant to:
 - .1 Verify project requirements.
 - .2 Review installation and substrate conditions.
 - .3 Review manufacturer's installation instructions and warranty requirements.

1.5 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Product Data:
 - .1 Provide two copies of most recent technical roofing components data sheets describing materials' physical properties and include product characteristics, performance criteria, physical size, finish and limitations.
 - .2 Provide two copies of WHMIS MSDS for all materials to be used.

1.6 INSPECTION AND TESTING

- .1 Inspection of membrane roofing and associated work, will be done by the Independent Consultant appointed by the Owner. Notify the Consultant at least 48 hours before commencement of any roofing work.
- .2 The Consultant reserves the right to have cut tests made in the presence of the Contractor. Costs of tests and subsequent repairs shall be borne by the Contractor.
- .3 The Consultant shall be notified in the event that the specifications conflict with the Manufacturer's recommendations or CRCA guidelines.
- .4 The inspection and testing service does not relieve the Contractor of his responsibility for quality control of production and for errors made by him.

1.7 QUALITY ASSURANCE

- .1 Installer qualifications: company or person specializing in application of modified bituminous roofing systems with 5 years documented experience approved by manufacturer.
- .2 Compatibility between all components of roofing system is essential.
- .3 The Contractor shall be responsible for ensuring that all items he elects to use are compatible with each other.
- .4 Study all documents which describe, or are related to any operation before commencement of that operation. Report discrepancies discovered between existing conditions and documentation. Obtain ruling on required interpretation before commencing work.
- .5 Ensure that materials, equipment, services and operatives are brought to site in sufficient quantity and in accordance with requirements of the work schedule.

1.7 FIRE PROTECTION

- .1 Fire Extinguishers:
 - .1 Maintain one cartridge operated type or stored pressure rechargeable type with hose and shut-off nozzle,
 - .2 ULC labelled for A, B and C class protection.
 - .3 Size 9 kg on roof per torch applicator, within 6 m of torch applicator.
- .2 Maintain fire watch for 2 hours after each day's roofing operations cease. Continuously use watch period to operate an infra-red thermometer over days operations to eliminate the possibility of hot spots.

1.8 DELIVERY, STORAGE, AND HANDLING

- .1 Deliver, store and handle materials in accordance with manufacturer's written instructions.
- .2 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 felt and membrane in upright position. Store membrane rolls with salvage edge up.
 - .4 Remove only in quantities required for same day use.
 - .5 Place plywood runways over completed Work to enable movement of material and other traffic.
 - .6 Store sealants at +5 degrees C minimum.
 - .7 Store insulation protected from daylight and weather and deleterious materials.
 - .8 Any materials damaged and/or exposed to the elements and/or moisture, shall be removed from the work site at the discretion of the Consultant.
 - .9 Stockpiling of materials on the roof will not be allowed. Distribute material as directed by the Consultant.
- .3 Packaging Waste Management: remove for reuse and return by manufacturer of pallets crates padding and packaging materials.
 - .1 Collect and separate plastic, paper packaging and corrugated cardboard in accordance with Waste Management Plan.

- .2 Fold up metal banding, flatten and place in designated area for recycling.
- .4 Clean up as work progresses. Upon completion, remove scaffolding, temporary protections and surplus materials. Make good any defects noted at this stage. Clean areas affected under contract, to a condition at least equal to that previously existing and to satisfaction of the Consultant.

1.9 PREPARATION

- .1 All materials that may be reused on the new roof system, salvage and store for inspection by the Consultant. Credits for such materials may be requested.
- .2 The Contractor is solely responsible for the disconnection, relocation and re-installation of all existing mechanical and electrical services as required.
- .3 Ensure that the Owner is aware of any such work that may effect the interior environment of the building, prior to disconnection or shut down.
- .4 Disconnection and reconnection of all electrical services to meet latest regulations of Canadian Electrical Code and applicable Municipal and Provincial Codes and Regulations. In each and every instance of application, Code, Regulation, Statute, By-Law or Specification, the most stringent requirements shall apply.
- .5 Provide the Owner with a schedule indicating time and dates, for any work creating a disruption to the interior environment and obtain the Owner's written approval.

1.10 SITE CONDITIONS

- .1 Ambient Conditions
 - .1 Do not install roofing when temperature remains below -15°C for torch application.
 - .2 Minimum temperature for solvent-based adhesive is -5°C.
- .2 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.
- .3 All adjacent parts of the building shall be protected from damage caused by roofing operations. Cover walls and other surfaces in the vicinity of hoisting apparatus with heavy canvas or other suitable protective material. Any damage caused by this contract shall be repaired to match the original materials and appearance.
- .4 Locate equipment and materials in areas designated by the Consultant and/or Owner.
- .5 Conduct operations so as to leave deck exposed for minimum period of time. Protect, as required, to prevent water infiltration or environmental damage to building interior.
- .6 Provide temporary membrane to render deck watertight, if for some unforeseen reason work cannot be completed as specified. All temporary membranes shall be removed completely prior to any further roofing work.
- .7 Where work must continue over finished roofing membrane, protect surface with minimum 12.5mm thick plywood sheets.
- .8 Any sharp projections, that in the opinion of the Consultant may penetrate the membrane, shall be ground smooth and flush.

- .9 All aspects of the re-roofing operation shall follow in close sequence. No part of the operation shall be so far ahead of the succeeding part that the latter cannot be finished that working day.

1.14 WARRANTY

- .1 **The warranty shall be a period of two (2) years from the date of final completion. Repair of any actual leaks shall also include the removal and replacement of all related moisture damage materials.**
- .2 Make all necessary repairs and replacements within 48 hours of receipt of written notification.
- .3 Nothing contained in this Article shall be construed as in any way restricting or limiting the liability in common law and statutory liability of the Contractor.
- .4 Provide a manufacturer's warranty, which shall guarantee the membranes and membrane flashing performance, for a period of ten years against manufacturing defects and premature deterioration.
- .5 Provide these written warranties, confirming above, issued on the corporate letterhead, signed and sealed by an authorized signing officer. The warranties will specifically reference the name of the Building, location and Owner.

Part 2 Products

2.1 PERFORMANCE CRITERIA

- .1 Compatibility between components of roofing system is essential. Provide written declaration to Consultant stating that materials and components, as assembled in system, meet this requirement.

2.2 SHEATHING

- .1 See Section 06 10 00 for product and application requirements. Sheathing shall be as recommended by the membrane manufacturer. Where cement board is not recommended by the membrane manufacturer, the sheathing shall be plywood and used in combination with self adhering base sheet flashing.
- .2 Joint tape for all vertical joints in cement board at parapets and curbs and all joints and transitions in protection board, shall be a self adhering modified bitumen membrane, as distributed by the membrane manufacturer. Tape shall be 150mm wide and a minimum of 1.2mm thick.

2.3 PRIMER

- .1 Asphalt primer: to CGSB 37-GP-9Ma ASTM D 41.

2.4 VAPOUR RETARDER

- .1 Base sheet: to CGSB 37-GP-56M polyester fibres to ASTM D 6164 glass fibres to ASTM D 6163 combination of polyester and glass fibres to ASTM D 6162.
- .1 Styrene-Butadiene-Styrene (SBS) elastomeric polymer prefabricated sheet, glass or polyester reinforcement, having nominal weight of 180 g/m².

- .2 Type 1, fully adhered.
- .3 Class C - plain surfaced.
- .4 Grade 1 - standard service.
- .5 Top and bottom surfaces:
 - .1 Polyethylene.
- .6 Base sheet membrane properties: to CGSB 37-GP-56M.

2.5 INSULATION

- .1 Rigid closed cell polyisocyanurate insulation bonded on upper and lower surfaces to a type 3 inorganic glass fibre facer. Material shall meet CAN/CGSB-51.26-M86 and CAN/ULC-S704, The boards shall be distributed in 1200mm x 1200mm panels, pre-wrapped to prevent moisture ingress. Standard of acceptance shall be Johns Manville Enrgy 3, IKOTerm III polyisocyanurate insulation or Atlas Roofing Corp AC FOAM III.
- .2 Fibrous glass batts, friction fit, unfaced to CSA A101 latest edition.

2.6 SLOPED INSULATION

- .1 In drain sumps, rigid closed cell polyisocyanurate insulation bonded on upper and lower surfaces to an inorganic glass fibre facer. Material shall meet CAN/CGSB-51.26-M86 and CAN\UL-S126-M. The boards shall be distributed in 1200mm x 1200mm panels, pre-wrapped to prevent moisture ingress. Standard of Acceptance shall be Johns Manville Enrgy 3, IKOTerm III polyisocyanurate insulation or Atlas Roofing Corp AC FOAM III. or approved equal.
- .2 Insulation slopes shall be as indicated on the detailed drawings and roof plans. The degree of slope shall be 1:50 or as noted on drawing.
- .3 Modules shall be factory cut to correct slopes.

2.7 MEMBRANE

- .1 Base sheet: to CGSB 37-GP-56M polyester fibres to ASTM D 6164 glass fibres to ASTM D 6163 combination of polyester and glass fibres to ASTM D 6162.
 - .1 Styrene-Butadiene-Styrene (SBS) elastomeric polymer prefabricated sheet, glass or polyester reinforcement, having nominal weight of 180 g/m².
 - .2 Type 1, fully adhered.
 - .3 Class C - plain surfaced.
 - .4 Grade 1 - standard service.
 - .5 Top and bottom surfaces:
 - .1 Polyethylene.
 - .6 Base sheet membrane properties: to CGSB 37-GP-56M.
- .2 Cap sheet membrane and Walkways: to CGSB 37-GP-56M combination of polyester and glass fibres to ASTM 6162.
 - .1 Styrene-Butadiene-Styrene(SBS) elastomeric polymer, prefabricated sheet, glass or polyester reinforcement, having nominal weight of 250 g/m².
 - .2 Type 1, fully adhered.
 - .3 Class A-granule surfaced.
 - .1 Colour for granular surface
 - .4 Grade 1-standard service.
 - .5 Bottom surface polyethylene.
 - .6 Cap sheet membrane properties: to CGSB 37-GP-56M.

2.8 ADHESIVE

- .1 Adhesive for securing insulation, tapered insulation and overlay board shall be
 - a) an asphalt extended vulcanized adhesive.
 - b) a single component urethane adhesive, dispensed from a portable pre-pressurized container requiring no external power source.
 - c) a single component solvent free moisture curing adhesive.
 - d) a two component, elastomeric, moisture cured; low rise urethane foam adhesive that contains no solvents.
- .2 Adhesive for securing overlay board and insulation or a solvent-free moisture curing adhesive. Standard of acceptance shall be Duotack by Soprema, Elite by Tremco or Cold Gold by IKO.

2.9 OVERLAY BOARD

- .1 Overlay Board: 6 mm thick asphalt based recovery board with non-woven glass facers, as recommended by the membrane manufacturer.
 - .1 Install over insulation to provide torch safe surface and cover joints with self adhesive fire resistant tape as specified in 2.2.2.

2.10 ACCESSORIES

- .1 Roofing Nails: to CSA B111-1974, Table 12, of galvanized steel or aluminum, sufficient length to penetrate wood substrate at least 25mm. Nails to have a minimum head diameter of 25mm.
- .2 Metal Securing Strips: 25mm wide, .67mm galvanized steel double hemmed.
- .3 Pipe sealing shall include a cement curb and rubberized filler. Pourable rubberized sealant shall be a two component urethane pourable and self levelling sealant. Curb shall be an inorganic composite material to withhold the sealer and prevent leakage of sealer. Standard of acceptance shall be by Chem-Link and Chem-curb, or Roofpart Elastomeric Silicone Sealant by Lexcor or an approved equal
- .4 Vent Stack Flashings and guy line flashing: to be spun aluminum sleeve to fit over the vent stack with sufficient space to insulate. A spun aluminum cap to fit outside the sleeve and inside the vent stack inside diameter.
- .5 Precast Concrete Paver: to CSA A231.1-1972, plain surfaced, 600mm x 600mm (24" x 24") size 50mm (2") thick. Colour grey. Rigid Insulation: under pavers and sleepers to be extruded expanded foamed polystyrene conforming to CAN/CGSB 51.20-M87 Type 4 and shall be 25mm thick.
- .6 Gas pipe support to be a 200mm x 250mm high density polypropylene UV resistant base, complete with 250mm HDG threaded rods and roller. Standard of Acceptance to be Portable Pipe Hangers by PHP or an approved equal.
- .7 Fire Escape Upgrades and deck closures - Steel Sections and Plates: to CAN3-G40-221-M81, Grade 300w
Welding Materials: to CSA W59-1982.
Galvanizing: hot dipped galvanizing with zinc coating 600g/m² to CSA G164-M1981.
Painting shall be a two coat application of Polyamide-Epoxy Two Component. Standard of Acceptance shall be PITT-GUARD Rapid coat 95-245, by Pittsburgh Paints, or an approved equal.
- .8 Steel decking at enclosures shall be new 18 guage galvanized steel Q-Deck.

- .9 Lightning Protection: Re-use existing and supplement with new 9.5mm solid copper rods 905mm high, copper stranded 270glm, 1.0mm strands and wrought copper connectors to IEEE 837.

Execution

3.1 QUALITY OF WORK

- .1 Do examination, preparation and roofing Work in accordance with Roofing Manufacturer's Specification Manual and CRCA Roofing Specification Manual Provincial Roofing Association Manual, particularly for fire safety precautions.
- .2 Do priming in accordance with manufacturers written recommendations.
- .3 The interface of the walls and roof assemblies will be fitted with durable rigid material sheet metal or plywood providing connection point for continuity of air barrier.
- .4 Assembly, component and material connections will be made in consideration of appropriate design loads, with reversible mechanical attachments.

3.2 EXAMINATION OF ROOF DECKS

- .1 Verification of Conditions:
 - .1 Inspect with Consultant deck conditions.
- .2 Evaluation and Assessment:
 - .1 Prior to beginning of work ensure:
 - .1 Decks are firm, straight, smooth, dry, free of snow, ice or frost, and swept clean of dust and debris. Do not use calcium or salt for ice or snow removal.
 - .2 Curbs have been built.
 - .3 Plywood and lumber nailer plates have been installed to deck, walls and parapets as indicated.
 - .3 Do not install roofing materials during rain or snowfall.

3.3 PROTECTION OF IN-PLACE CONDITIONS

- .1 Cover walls, walks and adjacent work where materials hoisted or used.
- .2 Use warning signs and barriers. Maintain in good order until completion of Work.
- .3 Clean off drips and smears of bituminous material immediately.
- .4 Protect roof from traffic and damage. Comply with precautions deemed necessary by Consultant.
- .5 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.

3.4 PRIMING

- .1 Apply primer to roofing substrate at the rate recommended by manufacturer 2.5 L per 10 m² in areas not covered with protection board.

3.5 VAPOUR RETARDER

- .1 Install under new wood blocking as detailed on the drawings and lap over parapets.
- .2 Commencing at the lowest point of the roof, apply vapour barrier by torching application. Apply membrane with 75mm side laps and 150mm end laps. Supplement adhesion where necessary with additional membrane strips to ensure waterproof protection until application of roof assembly.
- .3 Ensure membrane is unrolled to enable membrane to relax prior to installation. Time required for relaxation will vary with weather conditions.
- .4 Torch weld all lap joints by heat softening the membrane and pressing the edge of the membrane firmly with a roofing trowel. Ensure consistent adhesion has been achieved between the substrate and base sheet membrane.

3.6 (EXPOSED) CONVENTIONAL MEMBRANE ROOFING (CMR) APPLICATION

- .1 Install insulation to meet thickness as required in scope of work and indicated on the drawings. Ensure polyethylene film on base sheet vapour barrier is completely removed prior to applying adhesives.
- .2 Stagger all joints in the boards, for all layers.
 - .1 Adhere insulation to vapour barrier using adhesive.
 - .2 Cut end pieces to suit.
 - .3 Apply adhesive in continuous 13mm ribbons at 200 mm on centre.
- .3 In the sump area around the drain, reduce base insulation by 25mm and install sloped insulation as detailed.
- .4 Cap all insulation, as detailed, with the overlay board, secured with the specified adhesives.
- .5 Unless specifically stated otherwise, strictly follow the adhesives Manufacturers printed instructions for the application of the adhesives, including spread patterns and requirements for walking over the boards.
- .6 Overlay Board: adhesive application:
 - .1 Adhere overlay board to insulation with adhesive at the rate of one 13 mm ribbon at 200 mm O.C.
 - .2 Place boards in parallel rows with end joints staggered.
 - .3 Cut ends to suit and apply adhesive in continuous ribbons at 200 mm on centre.
 - .4 Install fire tape over all joints as distributed by membrane manufacturer.
- .7 Base sheet application:
 - .1 Starting at low point of roof, perpendicular to slope, unroll base sheet, align and reroll from both ends.
 - .2 Unroll and torch base sheet onto substrate taking care not to burn membrane or its reinforcement or substrate.
 - .3 Lap sheets 75 mm minimum for side and 150 mm minimum for end laps.
 - .4 Application to be free of blisters, wrinkles and fishmouths.
- .8 Cap sheet application:
 - .1 Starting at low point on roof, perpendicular to slope, unroll cap sheet, align and reroll from both ends.
 - .2 Unroll and torch cap sheet onto base sheet taking care not to burn membrane or

its reinforcement.

.3 Lap sheets 75 mm minimum for side laps and 150 mm minimum for end laps.

Offset joints in cap sheet 300 mm minimum from those in base sheet.

.4 Application to be free of blisters, fishmouths and wrinkles.

.5 Do membrane application in accordance with manufacturer's recommendations.

.9 Flashings:

.1 Complete installation of flashing base sheet stripping prior to installing membrane cap sheet.

.2 Torch base and cap sheet onto substrate in 1 metre wide strips.

.3 Lap flashing base sheet to membrane base sheet minimum 150 mm and seal by mopping or torch welding.

.4 Lap flashing cap sheet to membrane cap sheet 250 mm minimum and torch weld.

.5 Provide 75 mm minimum side lap and seal.

.6 Properly secure flashings to their support, without sags, blisters, fishmouths or wrinkles.

.7 Do work in accordance with manufacturer's recommendations Section 07 62 00 - Sheet Metal Flashing and Trim.

.8 Install reinforcing gussets at all inside and outside corners as per manufacturer's recommendations.

.9 Granules shall be embedded for the preparation of the selvage where the membrane will overlap on the mineral surface.

.10 Using the propane torch, heat the back of the flashing strip until the coating flows and bonds to the roof and up to the vertical. Press in firmly for proper adhesion. Continue by bonding the upper portion to the wall, taking precautions not to stretch the membrane. Secure all membrane flashings to verticals with continuous securement strips installed along the top edge of membrane flashings and fastened at 300mm O.C. or as detailed. Lap all flashing strips to the selvage or a minimum of 75mm and seal the laps securely.

.11 Use a wet sponge to tamp the membranes in place at the junction of the horizontal and vertical surfaces.

.12 Torch application of membrane flashings shall be performed by skilled tradesmen in accordance with the manufacturer's recommendations.

.6 Roof penetrations:

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

3.7 PAVERS

.1 Locate pavers as detailed and seat on a layer of cap sheet membrane and 25mm type 4 polystyrene, as shown on drawing. Provide 25mm spacing between each paver.

3.8 VERTICAL PIPE FLASHING

.1 Construct new composite curbs around base of pipe after installation of cap sheet membrane. Curb alignment shall be performed to ensure curbs are of consistent size and centered on the pipe.

.2 Adhere curb to membrane and seal all joints, prior to installing rubberized filler. Mix rubberised filler immediately before filling and cove to exterior for drainage.

3.9 SOIL VENT FLASHING

- .1 Install new sleeves over existing vents and centre on existing vent/anchor.
- .2 Prime aluminum flange and set into a coat of compatible mastic. Flash with one (1) ply of base sheet membrane for reinforcement, to extend a minimum of 200mm beyond flange. Complete installation with the application of the cap sheet membrane.
- .3 Install batt insulation between vent and aluminum flashing.
- .4 Caulk as detailed.

3.10 FIRE ESCAPE MODIFICATIONS

- .1 Temporarily remove the central portion of the fire escape to facilitate new roof construction. Remove the minimum amount of steel to allow access and reinstate by welding and supplement with new steel plates where necessary. Grind and wire brush sufficient paint to facilitate continuous welds.
- .2 Support and supplement with 6mm steel plates where necessary.
- .3 New sections shall be continuously welded to prevent water accumulation and sloped to encourage water run off.
- .4 Painting work shall include all fire escape surfaces (including underside) and new steel sections and shall be carried out in accordance with the best standard practices of the industry in accordance with CAN/CGSB-1.40-(M89), CAN/CGSB-1.138-(M93), CGSB-1.189M-(78), CGSB-85-GP-2M-(78). Perform all painting applications in accordance with CAN/CGSB-85.100. On metal, use a polyester or nylon brush, short nap roller or spray application in accordance with manufacturers printed requirements. Stir thoroughly before use and mix cans when more than one can is to be used. Use a mechanical mixer. Spread rates shall be: Base Coat Wet mils – 7.0 to 10.0, Dry mils – 5.0 to 7.0. Top-coat, Wet mils – 5.5 to 8.3, Dry mils – 2.0 to 3.0

3.11 BATT INSULATION

- .1 Install batt insulation to fully fill stud/vent flashing cavities as required within the specification and shown on the drawings.

3.12 METAL FLASHING

- .1 Metal flashings are specified in Section 07 62 00. Co-ordinate this work with that section.

3.13 LIGHTNING PROTECTION

- .1 On completion of work, install lightning protection to CAN/CSA-B72.
- .2 Bond discharge conductors to service masts or other non-current carrying electrical parts.
- .3 Submit certificate of installation to Consultant.

3.14 GENERAL

- .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. Patching of the cap sheet membrane shall be carried out utilizing patches with a minimum size of 450mm by 1000mm. Minimum length of cap sheet on flat run of roof shall not be less than 1000mm. Wrinkled or deformed ends of cap sheet rolls will not be tolerated and therefore must be discarded prior to application.
- .3 Following completion of new roofing, torch soften and apply a liberal application of approved bulk type mineral granules to cap sheet membrane edges where asphalt has extruded or flowed beyond clean lines and to all surface damage.
- .4 Splices in delivered rolls of membrane are to be removed. Cut back the roll 450mm on both sides of the splices and remove prior to installation.
- .5 At end of each day: Install water cut-offs and remove completely prior to continuing further roofing applications. Inspect all laps of the membrane application to ensure they are properly bonded. Repair any deficiencies prior to leaving the site for the day. Base sheet applications should not be left exposed overnight unless all seams are torch welded prior to leaving the work site.

END OF SECTION

Part 1 General

1.1 RELATED SECTIONS

- .1 Supplementary General Conditions of Contract
- .2 Section 07 52 00 - Modified Bituminous Membrane Roofing

1.2 REFERENCES

- .1 American Society for Testing and Materials International (ASTM)
 - .1 ASTM A 653/A 653M-11, Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
- .2 Canadian General Standards Board (CGSB)
 - .1 CAN/CGSB 19.13-M87, Sealing Compound, One-Component, Elastomeric, Chemical Curing.
- .3 Canadian Roofing Contractors Association (CRCA)
 - .1 CRCA Roofing Specifications Manual 2011.
- .4 Health Canada/Workplace Hazardous Materials Information System (WHMIS)
- .5 S.M.A.C.N.A. Architectural Manual.

1.3 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Provide submittals if requested.
- .2 Product Data:
 - .1 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.
 - .2 Submit two copies WHMIS MSDS - Material Safety Data Sheets in accordance with Section 01 35 29.06 - Health and Safety Requirements.
- .3 If requested, submit samples of sheet metal flashing specified, before proceeding with the work, showing proposed method of shaping, forming, jointing and fastening.
- .4 Submit samples if approval of substitutions is requested.

1.4 QUALITY ASSURANCE

- .1 Pre-Installation Meetings: convene pre-installation meeting one week prior to beginning work of this Section and on-site installation, with contractor's representative and Consultant:
 - .1 Verify project requirements.
 - .2 Review installation and substrate conditions.
 - .3 Co-ordination with other building subtrades.
 - .4 Review manufacturer's installation instructions and warranty requirements.

1.5 GENERAL SCOPE

- .1 Supply and install all sheet metal caps, counter flashings, gravel stops, fascia and all other roof related metal flashings required to complete roof installation.
- .2 Form to profiles as detailed upon the drawings, or as required to suit specific site conditions.

1.6 WORKMANSHIP

- .1 Sheet metal flashings work shall be carried out in accordance with the best standard practices of the industry ; with joints locked, cleated, caulked as required, and exposed edges hemmed. Ample allowance shall be made in all work for expansion and contraction without compromising the waterproofing integrity of the structure.
- .2 Mitred corners shall be straight and profiles level as indicated on the drawings or as required to suit the specific site conditions, with flat surfaces free of distortion and free of face nailing.
- .3 Standard practices, unless otherwise noted herein, shall be deemed to constitute recommended procedures published in S.M.A.C.N.A. Architectural Manual and the CRCA Canadian Roofing Contractors Association Guidelines.

Part 2 Products

2.1 SHEET METAL MATERIALS

- .1 Zinc coated steel sheet: 0.55 mm thickness, commercial quality to ASTM A 653/A 653M, with Z275 designation zinc coating.

2.2 PREFINISHED STEEL SHEET

- .1 Prefinished steel with factory applied silicone modified polyester.
 - .1 Class F1S.
 - .2 Colour to match existing sheet metal.
 - .3 Specular gloss: 30 units +/- 5 in accordance with ASTM D 523.

2.3 ACCESSORIES

- .1 Sealants: One component polyurethane base caulking to CAN/CGSB 19.13.
- .2 Cleats and starter strips: of same material, and temper as sheet metal, continuous. Thickness 0.65 mm.
- .3 Fasteners: of same material as sheet metal, ring thread flat head roofing nails of length and thickness suitable for metal flashing application. Cadmium plated screws, coloured head, will be permitted only in areas where exposed fasteners are accepted by the Consultant.
- .4 Touch-up paint: as recommended by prefinished material manufacturer.
- .5 Self-adhering waterproof membrane to be comprised of modified asphalt with a consistent layer of adhesive applied to one side. Standard of Acceptance to be Bithuthene 3000 as manufactured by Grace Construction Products Division, Colphene 1500 as manufactured by Soprema Waterproofing Inc., or Blueskin SA as manufactured by Bakor Inc. or IKO Gold

2.5 FABRICATION

- .1 Fabricate metal flashings and other sheet metal work as indicated and as required to match existing profiles.
- .2 Form pieces in 2400 mm maximum lengths.
 - .1 Make allowance for expansion at joints.
- .3 Hem exposed edges on underside 12 mm. All free edges of metal flashing shall be strengthened by a fold at least 13mm wide, set out slightly and presenting a straight line and neat finish.
 - .1 Mitre and seal corners with sealant.
- .4 Form sections square, true and accurate to size, free from distortion and other defects detrimental to appearance or performance.
- .5 Apply isolation coating to metal surfaces to be embedded in concrete or mortar.

2.6 METAL FLASHINGS

- .1 Form flashings, copings and fascias to profiles indicated of 0.55 mm thick prefinished steel.
- .2 Metal shall be formed on a bending brake, shaping trimmed and hard seaming shall be done on bench, as far as practicable, with proper sheet metal working tools. Angles of bends and folds for interlocking metal shall be made with full regard to expansion and contraction to avoid buckling and to avoid damaging metal surfaces.
- .3 Dry joints are to be tight but not dented so as to permit slight adjustments of sheets and yet remain watertight.
- .4 Lock seams at all corners.
- .5 Space exposed fasteners evenly and in an organized pattern, keep number to a minimum. Where exposed to view, use metal fasteners of same material, colour, texture and finish as the metal on which they occur. Obtain written approval from the consultant before installing any exposed fasteners.

Part 3 Execution

3.1 MANUFACTURER'S INSTRUCTIONS

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

3.2 FLASHING INSTALLATION

- .1 Install sheet metal work as detailed.
- .2 Use concealed fastenings except where approved before installation.
- .3 Counter Flashing: Install metal counter flashings as soon as possible after membrane flashings are in place and accepted by Consultant. Counter flashing shall have crimped bottom edge, stiffening break and shall extend up verticals as detailed. Secure sections of metal in S-lock joints and allow for sufficient expansion and contraction between each piece.

Secure metal counter flashing a minimum of 300mm above roof membrane. Use fasteners of sufficient length to penetrate at least 25mm into substrate.

- .4 Cap Flashing: Supply and install continuous metal starter strips, secure at 600mm O.C. maximum of 50mm above drip edge, with fastener of sufficient length to penetrate a minimum of 25mm into substrate. Secure sections of metal in S-lock joints, and allow for sufficient expansion and contraction between each piece. Form cap flashings to profiles as shown on the detail drawings. Ensure positive drainage to the interior (roof surface) areas.
- .6 Insert metal flashing under cap flashing to form weather tight junction.
- .7 Caulk flashing at terminations with sealant.
- .8 Install pans, where shown around items projecting through roof membrane.

3.3 CAULKING

- .1 Install caulking in accordance with the manufacturer's latest recommendations.
- .2 Remove existing sealants, dust, grease, oil and all other deleterious materials that may effect the adhesion and performance of the new caulking.
- .3 Clean all surfaces to receive caulking with cloths soaked with solvent as recommended by caulking manufacturer, and wipe dry with clean cloth.
- .4 Install caulking in continuous beads using gun with properly sized nozzle.
- .5 Apply caulking smooth, free of ridges, wrinkles, sags, air pockets or embedded impurities.
- .6 Tool finish to the satisfaction of the Consultant, ensuring a uniform and consistent profile and remove excess compound promptly as work progresses.

3.4 CLEANING

- .1 On completion and verification of performance of installation, remove surplus materials, excess materials, rubbish, tools and equipment. Remove and discard all sheet metal scraps and fasteners not required to complete the work. Remove and replace all sheet metal sections that received surface damage or scratches during fabrication, delivery or installation.
- .2 Leave work areas clean, free from grease, finger marks and stains. Finished sheet metal flashing work shall be clean and left in neat, workmanlike condition. Adjoining materials shall be properly cleaned of soil caused by this trade.

END OF SECTION

1 General.

1.1 RELATED SECTIONS

- .1 Supplementary General Conditions of Contract
- .2 Section 07 52 00 - Modified Bituminous Membrane Roofing.

1.2 GENERAL SCOPE

- .1 Provide the necessary labour and materials to complete the removal of all the existing drain assemblies in the contract area.
- .2 Provide the necessary labour and materials to install new roof drains as detailed, in the same locations and as required in the specifications herein, all required clamps, insulation, vapour wrap and all other items required to complete the new drain installation.
- .3 Provide sufficient dust and debris protection for the temporary removal of ceiling tiles, cutting ceilings and installation of access hatches and include for any supplemental clean up to return interiors to pre-construction conditions.
- .4 Unless indicated otherwise, the plumbing sub-trade shall be responsible for the removal and reinstatement of furniture, plants and interior equipment, excluding computers, monitors, copiers and the like.
- .5 Ensure the roof is provided with operational drainage at the end of each work day.

1.3 REFERENCES

- .1 Canadian Standards Association (CSA):
 - .1 CAN/CSA B70.1-03 (R2008), Frames and Covers for Maintenance Holes and Catchbasins.
 - .2 CSA B79-08, Commercial and residential drains and cleanouts.
- .2 Conform with National Building Codes and requirements of Provincial and Municipal Authorities. Most stringent requirements shall govern where in conflict.
- .3 Health Canada/Workplace Hazardous Materials Information System (WHMIS).
 - .1 Material Safety Data Sheets (MSDS).

1.4 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Co-ordinate submittal requirements and provide submittals.
- .2 Product Data:
 - .1 Submit manufacturer's printed product literature, specifications and datasheet for drains, pipe and hangers.
 - .2 Indicate dimensions, construction details and materials for specified items.

1.5 PREPARATION

- .1 Cut new openings, as required, through existing deck to correct size to accommodate new drains. Cut access of sufficient size to access ceilings and provide ceiling supports where necessary to carry weight of workers and materials.
- .2 Remove and discard existing drains and pipe fittings that are no longer required.
- .3 Restore openings and other components damaged or removed during the new installations to match the pre-construction conditions.

1.6 QUALITY ASSURANCE

- .1 All drain installations shall be completed by plumbing subtrades, licensed to undertake plumbing work in Ontario.
- .2 Equipment and materials must be new and free of imperfections.
- .3 Before restoring interior finish, water test all work to ensure new system performs without leakage.

2 Products

2.1 ROOF DRAINS

- .1 Seamless flange and bowl drain, complete with deck clamp, cast aluminium dome strainer with hinged access gate and aluminium membrane clamp. Connections shall be made with mechanical clamps. Membrane bearing pan/flange shall be copper. Standard of acceptance shall be Thaler RD-4C –or approved equal.

2.2 PIPE AND ACCESSORIES

- .1 Cast iron to CSA B70.1, class 4000 sized to match existing system.
- .2 Joints - Mechanical with stainless steel clamp.
- .3 Pipe hangers adjustable wrought iron design to allow pipe movement.
- .4 Insulation 25 mm thick mineral fibre with PVC vapour jacket.

3 Execution

3.1 MANUFACTURER'S INSTRUCTIONS

- .1 Compliance: comply with manufacturer's written recommendations or specifications, including product technical bulletins, handling, storage and installation instructions, and data sheet.

3.2 DRAIN INSTALLATION

- .1 Fit roof drains to drainage pipe and fittings with mechanical connections as specified. Make joints watertight and gas-tight.
- .2 Secure to existing substrate with mechanical clamps and refer to Thaler connection detail M-2
- .3 Adjust roof drain height to match new roof membrane thickness.
- .4 Set to permit proper drainage and not retard water flow after completion of roof membrane plies.
- .5 Provide insulation as detailed at the junction of the rain water leader and the underside of the structural deck.

3.3 RESTORATION

- .1 Restore openings cut through roof deck to match the pre-construction conditions. Restore openings cut into finished areas to match the pre-construction conditions and paint to the satisfaction of the Consultant.
- .2 Install new access panel as specified and restore openings cut into finished areas to match the pre-construction conditions and paint to the satisfaction of the Consultant.

END OF SECTION