SPECIFICATIONS FOR

ROOF REPLACEMENT 2017

SIR FREDERICK BANTING BUILDING
251 SIR FREDERICK BANTING DRIVEWAY
OTTAWA, ONTARIO

Prepared for:

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END OF SECTION

1.1 GENERAL DESCRIPTION OF THE WORK

.1 Work to be carried out under this Contract, Roof Replacement at Sir Frederick Banting Building, Tunney's Pasture, Ottawa, Ontario.

.2 Provide the necessary labour and materials to complete the removal of the existing roofing system, existing curbs, sheet metal flashings and membrane down to the existing structural deck and install new roofing system as specified herein.

.3 The new roof system shall be as follows and as specified in the areas indicated on the drawings:

.1 Typical Roof System R1:

.1 Existing concrete deck.

.2 Sloped insulation on air/vapour barrier.

.3 3 mm protection board.

.4 2-ply modified bituminous membrane.

.5 100 mm extruded polystyrene.

.6 Filter fabric.

.7 Stone ballast – Re-use existing.

.4 Supply and installation of related rough carpentry at parapets and curbs.

.5 Supply and install all sheet metal caps, counter flashings, scuppers, torch stops, fascia and all other roof related metal flashings required to complete roof installation.

.6 Supply and installation of all sealants required to seal the transition of membrane and related metal detailing and the termination of sheet metal and non-membrane surfaces.

.7 Supply and installation of new roof drains, clamps, insulation and wraps, required to complete the new drain installation.

1.2 CONTRACT

.1 The Standard Construction Document, CCDC 2, Stipulated Price Contract, 2008, shall form part of the Contract Documents for all projects. Project contracts will be issued in one of two methods.

.1 Projects Exceeding $30,000.00: will have a formal CCDC 2 Stipulated Price Contract issued that will be signed and sealed.

.2 Projects Less Than $30,000.00: will be validated by the issuance of a Purchase Order number while still being bound by the terms and conditions of the CCDC 2 Document.

.2 The Standard Construction Document, CCDC 2, Stipulated Price Contract, 2008, shall form part of the Contract Documents with amendments to definitions as indicated hereafter.

1.3 DEFINITIONS

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

.2 "OWNER" and “Health Canada” are synonymous.

.3 “CONSTRUCTOR” and “CONTRACTOR” are synonymous.

1.4 OTHER CONTRACTORS

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

1.5 USE OF THE SITE

.1 Carry out the Work so as to have the least possible interference and disturbance to the normal use of the premises. The successful bidder is expected to include in the bid an allowance for the performance of off-hours work should it be required to conform with the above.

.2 Maintain services to existing building and provide for personnel and vehicle access.

.3 Restrict construction access to and from site to approved location. Do not allow construction traffic to block entrances or exits for any reason.

.4 Co-ordinate any interference with Owner's operation in this area and abide by Owner's direction in this regard. In cases of conflicting requirements, Owner's operation takes precedence but all reasonable effort to accommodate Contractor's needs will be made.

.5 Construct a scaffold tower access to Roof A on the north side of the building. Scaffold shall be designed and approved by a structural engineer licensed to practice in the Province of Ontario. The access to the tower shall be hoarded with plywood and provided with a lockable gate. Erect temporary site enclosures using 38 x 89 mm construction grade lumber framing at 600 mm centres and 1200 x 2400 x 13 mm exterior grade fir plywood to CSA O121. Apply plywood panels vertically flush and butt jointed.

.6 The access to Roof B shall be by ladder from the west side of the building. The ladder shall be removed and locked at the end of each work period.

.7 Temporary overhead protection will be required at ground level sidewalks, where pedestrians are walking. All entrances directly below the contract areas shall have overhead protection. Protection shall consist of standard steel scaffolding with prefabricated plywood and steel roof covers and shall be a minimum of 2.0m wide by 2.4m unrestricted clear height.

.8 There are no roof anchors at the building.

.9 The contractor shall submit a hoisting and waste removal plan within 5 days of award of contract.

.10 The contractor shall demonstrate that propane hoisting and storage complies with MOL and TSSA requirements.

.11 The contractor shall display a Notice of Project in an area indicated by the Departmental Representative.

.12 A Designated Substance Report for the building is available and will be provided for review by the Departmental Representative at the time of tendering.

1.6 EXISTING SERVICES

.1 Before commencing work, establish location and extent of service lines in area of Work and notify Consultant of findings.

.2 Remove abandoned service lines within 2.4 m of structures. Cap or otherwise seal lines at cut-off points as directed by Consultant.

.3 Services are to be left operational unless otherwise authorized by Owner.

.4 Unless otherwise specified, the Contractor will be responsible for disconnection, relocation, re-installation and extending all services required to facilitate work under this Contract. Co-ordinate work with the Owner and provide minimum 48 hours notification if services are to be interrupted.

1.7 CUTTING AND PATCHING

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

1.8 PROTECTION OF PROPERTY

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

.2 Be responsible for damage incurred.

1.9 FIRE PROTECTION

.1 Provide and maintain temporary fire protection equipment during the performance of the Work as required by insurance companies and governing codes, regulations and by-laws having jurisdiction.

.2 Work requiring the generation of open flames (welding, soldering, etc…) cannot be performed until an Owner’s Permit has been issued. It is the responsibility of the successful bidder to apply for here said permit.

.3 Open fires and burning of rubbish are not permitted on site.

1.10 OCCUPATIONAL HEALTH AND SAFETY

.1 Follow the Ontario Provincial Occupational Health and Safety Act and Regulations for Construction Projects. For the purposes of the act, the person or company contracted to carry out the work shall be deemed the **"Constructor".**

.2 Hazardous materials, not identified by the Owner, may be encountered at the worksite. Use all necessary precautions when handling such material. It is possible that asbestos may exist in some form and if encountered the Contractor is responsible to notify the Owner and to follow Ontario Ministry of Labour regulations governing the handling of asbestos in the workplace.

.3 The Owner may cause those who do not comply with the O.H.S.A. and Regulations to be escorted from the site.

.4 Temporary overhead protection will be required at ground street level sidewalks, where pedestrians are walking. All entrances shall have overhead protection. Additional protection will also be required to prevent material from falling to the street from overhead scaffold platforms.

.5 Within 5 days of award of contract, the contractor shall submit a Site Specific Safety Plan, including a Fall Protection Plan and a Site Specific Hazard Assessment. Departmental Representative and Consultant will review Contractor's site-specific Health and Safety Plan and Hazard Assessment and provide comments to Contractor within 3 days after receipt of plan. Revise plan as appropriate and resubmit plan to Consultant within 2 days after receipt of comments from Departmental Representative and Consultant.

.6 Consultant’s review of Contractor's final Health and Safety plan should not be construed as approval and does not reduce the Contractor's overall responsibility for construction Health and Safety.

1.11 PROTECTION OF BUILDING FINISHES AND EQUIPMENT

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

.2 Keep noise, dust, and inconvenience to occupants to a minimum.

.3 Protect building systems, services and equipment. Protect all furnishings within work area with (6 mil) polyethylene film during construction. Remove film during non-construction hours and leave premises in clean, unencumbered and safe manner for normal daytime function.

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

1.12 PARKING

.1 Parking is not available on site. Costs for parking shall be included in the bid submission.

.2 Contractor’s vehicles on site shall be limited to reasonable loading and unloading of equipment and/or materials to a local entrance. Failure to observe these requirements may result the vehicle being ticketed and/or towed.

1.13 SIGNS AND ADVERTISEMENTS

.1 No signs or advertisements of any description other than notices regarding safety shall be displayed at the Work Site without permission of the Owner.

.2 Upon completion of the Work, all signs shall be removed except those specifically directed by the Owner to remain.

1.14 CLEAN-UP

.1 Maintain the work area in tidy condition, free from the accumulation of waste products and debris.

.2 Remove waste and materials regularly so as to maintain a tidy work site. Do not dispose of any waste in the Owner's facilities unless specifically directed to do so by authorised personnel.

.3 Store materials in areas specially designated by the Owner. Dispose of this debris in a legal manner so as to avoid causing a hazard to occupants and visitors on site.

1.15 MATCHING

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

1.16 PERMITS, FEES, CERTIFICATES

.1 Obtain and pay for all required permits. A Building Permit will not be required for this project.

1.17 DISRUPTION OF SERVICES

.1 The Contractor is responsible to provide adequate written notice to the Owner of any interruption of services (i.e., mechanical, electrical etc.) for the connection of new services or the alteration of existing.

.2 The Contractor is expected to co-operate reasonably with the Owner in the scheduling of service interruptions.

1.18 SANITARY FACILITIES

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

1.19 POWER

.1 Maximum power of 110V will be available at no cost. Any connection to this power source will be done at the Contractor's expense and liability, and in accordance with the Canadian Electrical Code.

1.20 WATER SUPPLY

.1 Water supply is available at no cost. Connection and disconnection will be at Contractor's expense and liability.

1.21 TEMPORARY FACILITIES

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

1.22 DOCUMENTS REQUIRED

.1 Maintain at the job site, one copy each of the following:

.1 Original Plans and Specifications and completed Form of Tender.
.2 Building Department stamped drawings if required.
.3 Any changes to Drawings or Details.
.4 Shop Drawings and any changes.
.5 Addenda.
.6 Change Orders.
.7 Site Instructions.
.8 Contractor's Safety Policy.
.9 Safety Data Sheets.

1.23 WORK SCHEDULE

.1 Required date for substantial completion of the Work is March 30, 2018**.**

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

1.24 CHANGES IN WORK

.1 All changes to the Contract Documents which result in an extra or credit to the Contract amount or time are not to be executed until written instructions have been received and the extra or credit agreed to in writing by all parties.

.2 Execute variations, alterations and substitutions that do not affect the intent, function, duration, or Contract amount, as instructed by the Consultant.

.3 If a change in the work, not covered by unit price or lump sum quote, results in an increase to the Contract Price, the charge shall be:

.1 15% for overhead and profit for work carried out by the Contractor’s own forces.
.2 10% for overhead and profit for work carried out by the Contractor’s Sub-Contractors.
.3 Sub-Contractors may charge 15% for overhead and profit for work carried out by their own forces.
.4 Sub-Contractors may charge 10% for overhead and profit for work carried out by their Sub-Contractors.

.4 Changes to the work that are considered urgent by the Owner shall be acted upon by the Contractor on the basis of a written field instruction to be confirmed by a Change Order. Costs are to be kept and presented along with all appropriate timesheet vouchers and bills of materials, or fixed sum if, work is done by a Sub-Contractor on a lump sum basis.

END OF SECTION

Part 1 General

1.1 RELATED SECTIONS

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

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

.3 Section 07 92 00 – Joint Sealants.

.4 Section 22 05 11 – Plumbing and Drainage.

1.2 REFERENCES

.1 ASTM International

.1 ASTM A653/A653M-11, Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.

.2 CSA International

.1 CSA B111-1974 (R2003), Wire Nails, Spikes and Staples.

.2 CSA O141-05 (R2009), Softwood Lumber.

.3 CSA O151-09, Canadian Softwood Plywood.

.3 National Lumber Grades Authority (NLGA)

.1 Standard Grading Rules for Canadian Lumber 2010.

.4 Underwriters' Laboratories of Canada (ULC)

.1 CAN/ULC-S701-05, Standard for Thermal Insulation, Polystyrene, Boards and Pipe Covering.

1.3 QUALITY ASSURANCE

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

.2 Plywood identification: By grade mark in accordance with applicable CSA Standards.

1.4 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.

Part 2 Products

2.1 LUMBER MATERIAL

.1 Lumber: Unless specified otherwise, softwood, S2S, moisture content 19% or less in accordance with following standards:

.1 CSA O141.

.2 NLGA Standard Grading Rules for Canadian Lumber.

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

.1 S2S is acceptable for all surfaces.

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

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

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

2.2 PANEL MATERIALS

.1 Canadian softwood plywood (CSP): To CSA 0151.

.1 Urea-formaldehyde free.

2.3 FASTENERS

.1 Wood to wood fasteners: Wood screw #12 or as indicated, galvanized flat head, of sufficient length to completely penetrate through base minimum 25 mm.

.2 Wood to steel deck fasteners: Secure bottom nailer with minimum two rows of No. 10, galvanized steel screws at maximum spacing of 600 mm. Screws shall be of sufficient length to penetrate top flute of decking a minimum 13 mm and a maximum of 19 mm. Screws to be factory coated with an additional corrosion protection equivalent to ‘Climaseal’ or better.

.3 Plywood to concrete, brick or hollow masonry fasteners: Tapcon 6 mm diameter screws. Length to provide minimum 32 mm and maximum 40 mm embedment into substrate as required. Drill holes 13 mm deeper than depth of fastener penetration. Type to be approved subject to results of pull tests.

.4 Nails, spikes and staples: To CSA B111.

2.4 FINISHES

.1 Galvanizing: To ASTM A653/A653M, use galvanized fasteners for all work.

Part 3 Execution

3.1 GENERAL INSTALLATION

.1 Comply with requirements of NBC, supplemented by the following paragraphs.

.2 Extend air/vapour barrier seals up vertical surfaces and curbs and onto the deck as shown on the Drawings, to provide continuity.

.3 Slope the top of all wood blocking at the roof perimeter in towards the roof at a minimum of 5%, unless otherwise shown on the Drawings.

.4 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.

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

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

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

.8 Install wood backing, dressed, tapered and recessed slightly below top surface of roof insulation for roof hopper.

3.2 SECUREMENT OF WOOD BLOCKING

.1 Comply with more stringent requirements as required by drawings or Ontario Building Code requirements. Increase number and spacing of all fasteners by 50% for 2400 mm from all outside roof corners.

.2 Install fasteners to the design intent to hold all wood blocking permanently in place to prevent warping, deflection and to resist all wind and weather conditions.

.3 Secure wood to concrete in a staggered pattern with each row spaced at minimum 600 mm c/c with specified fasteners.

.4 Secure wood to metal in a staggered pattern with each row spaced at 450 mm c/c with specified fasteners at minimum 450 mm c/c.

.5 Install fasteners in two rows in the direction of the grain, offset one to another in a staggered fashion by approximately 50%. All fasteners shall be placed minimum 10 mm from any edge of framing.

3.3 SHEATHING INSTALLATION

.1 Plywood:

.1 Not less than 2 mm gaps shall be provided between sheets, to allow for material expansion.

.2 Unless otherwise indicated, fasten plywood with a minimum of thirty-six fasteners per 1200 mm x 2400 mm sheet.

3.4 ERECTION

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

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

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

END OF SECTION

Part 1 General

1.1 GENERAL

.1 Contractor to provide an original, complete insurance policy identifying specific coverage for torch applied systems.

1.2 RELATED SECTIONS

.1 Section 06 10 00 - Rough Carpentry.

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

.3 Section 07 92 00 – Joint Sealants.

.4 Section 22 05 11 – Plumbing and Drainage.

1.3 REFERENCES

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

.1 ASTM A653/A653M-13, Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.

.2 Canadian Standards Association (CSA International)

.1 CAN/CGA-8.1-M86 (R2011), Elastomeric Composite Hose and Couplings for Conducting Propane and Natural Gas.

.2 CSA A231.1-14/A231.2-14, Precast Concrete Paving Slabs / Precast Concrete Pavers.

.3 Canadian General Standards Board (CGSB)

.1 CAN/CGSB-1.108-M89, Bituminous Solvent Type Paint.

.2 CGSB 37-GP-56M-80b(A1985), Membrane, Modified, Bituminous, Prefabricated, and Reinforced for Roofing.

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

.4 Underwriters Laboratories' of Canada (ULC)

.1 CAN/ULC-S701-05, Standard for Thermal Insulation, Polystyrene, Boards and Pipe Covering.

.2 CAN/ULC-S770-09, Standard Test Method for Determination of Long-Term Thermal Resistance of Closed-Cell Thermal Insulating Foams.

1.4 ADMINISTRATIVE REQUIREMENTS

.1 Convene pre-installation meeting one week prior to beginning roofing Work, with roofing contractor's representative and Consultant to:

.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 COORDINATION

.1 Coordinate work of this Section with related work specified in other Sections to ensure construction schedule is maintained and water tightness and protection of the building and finished work is maintained at all times.

1.6 ACTION AND INFORMATIONAL SUBMITTALS

.1 Product Data:

.1 Provide two copies or an electronic copy of most recent technical roofing components data sheets describing materials' physical properties and include product characteristics, performance criteria, physical size, finish and limitations for all products to be incorporated in the new system.

.2 Provide two copies or an electronic copy of WHMIS for:

.1 Primers.

.2 Sealers.

.3 Adhesives.

.2 Provide shop drawings:

.1 Provide layout for sloped insulation.

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 Only certified applicators are permitted to use torch welding equipment.

.3 Hold a pre-installation meeting prior to the start of roofing works, with the roofing contractor’s representative and the Consultant, to review installation conditions particular to this project.

1.8 FIELD QUALITY CONTROL

.1 Adhesion Testing:

.1 If requested by the Consultant, at each roof drainage area, following installation of membrane base sheet, carry out adhesion tests to confirm adhesion of membrane to substrate and substrate layers to each other, down to first mechanically attached layer.

.2 Locations and timing of tests will be directed by Consultant. Provide labour and materials as required to assist Consultant in conducting tests.

.3 If inadequate adhesion is found, conduct further testing to determine the extent of the inadequate adhesion. Replace all defective areas to the satisfaction of the Consultant. Replace substrate materials as necessary

with new materials, and patch cut tests with membrane patches extending at least 150 mm beyond the cut.

.4 Contractor is to assume all costs of testing and correction.

.2 Sample Testing:

.1 If requested by the Consultant, at each roof drainage area, following installation of membrane base sheet, carry out sample tests to confirm materials and installation of roof assembly components. Sample size to be 300 mm x 300 mm.

.2 Locations and timing of tests will be directed by Consultant.

.3 If inadequate construction is found, conduct further testing to determine the extent of the inadequate adhesion. Replace all defective areas to the satisfaction of the Consultant. Replace substrate materials as necessary with new materials, and patch cut tests with membrane patches extending at least 150 mm beyond the cut.

.4 Contractor is to assume all costs of testing and correction.

1.9 FIRE PROTECTION

.1 Fire Extinguishers:

.1 Pressure rechargeable type with hose and shut-off nozzle,

.2 ULC labeled for ABC class protection.

.3 ULC labeled for A class protection, for wood, paper and fibreboard.

.4 Size 14 kg.

.5 Have one fully charged ABC extinguisher and one fully charged Type A extinguisher on roof per torch applicator, within 3 m of the propane source.

.2 Maintain fire watch for 2 hours after each day's torching operations cease.

1.10 GENERAL REQUIREMENTS

.1 Comply with the General Requirements, General Instructions and Supplementary Conditions.

.2 Execute work in accordance with this Section and other related Sections, Drawings and Details.

.3 Attach roofing to structure to meet requirements of insurance underwriter and authorities having jurisdiction.

.4 Regard manufacturer’s printed recommendations as minimum requirement for materials, methods and workmanship not otherwise specified.

.5 Contact the Consultant if the specifications conflict with the manufacturer’s recommendations. Otherwise it will be assumed that the Contractor and manufacturer are in agreement with procedures outlined.

.6 Advise the Consultant of adjustments to specified roofing procedures caused by weather and site conditions. Make adjustment to specified procedures only after review with the Consultant.

.7 Maintain equipment in good working order to ensure control of roofing operations and protection of work. Types of roofing equipment and laying techniques to be employed are to meet the approval of the Consultant.

.8 Do not penetrate roof deck with any fastening devices that would do damage or impair the function of the assembly.

.9 All temporary drains shall be connected with a mechanical connection (MJ coupling) or a U-flow connection, until new drains are installed.

1.11 DELIVERY, STORAGE AND HANDLING

.1 Deliver, store and handle materials in accordance with manufacturer's written instructions.

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

.3 Manufacturer’s recommendations for handling and storing products are to be considered a minimum requirement.

.4 Materials shall be delivered to the site, undamaged and in their original packages, with manufacturer’s labels visible, attesting to their conformity to specific standards.

.5 Ensure that shelf life of materials has not expired.

.6 Remove damaged material from site and replace all rejected materials with new product.

.7 Elevate on raised platform and store as to prevent deformation of materials.

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

.9 Store rolls of membrane in upright position. Store membrane rolls with selvage edge up.

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

.11 Place plywood runways over completed Work and over areas not in Contract, as required, to enable movement of material and other traffic.

.12 Store sealants at +5°C minimum.

.13 Store insulation protected from daylight and weather and deleterious materials.

.14 Handle roofing materials in accordance with manufacturer's written directives, to prevent damage or loss of performance.

.15 Avoid stockpiling of materials or use of equipment on decks in a way which could cause overloading.

1.12 ENVIRONMENTAL REQUIREMENTS

.1 Ensure protection of products that are sensitive to damage by moisture. Do not work during rain, snow or fog. Stop work and make watertight before the onset of inclement weather or when weather appears imminent.

.2 Ensure protection of the building from weather at all times. If inclement weather is forecast or appears imminent, postpone work that would risk the building from moisture damage.

.3 If it becomes apparent that work would threaten the building watertightness, the Owner has the right to stop work. Any additional expenses due to work stoppage or postponement of work will be at the Contractor’s expense.

.4 Ambient Conditions

.1 Do not install roofing when ambient temperature remains below -18°C for torch application.

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

.5 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.

1.13 COMPATIBILITY

.1 Compatibility between materials is essential. Use only materials that are known to be compatible when incorporated in a complete assembly. Provide written declaration to Consultant stating that materials and components, as assembled in system, meet this requirement.

.2 Defective work resulting from work with incompatible materials will be considered the responsibility of the Contractor.

.3 Repair all work that could result in damage or interfere with performance.

1.14 EXISTING SUBSTRATES

.1 Following removal of existing material to the substrate, inspect the deck for soundness and notify the Consultant of any deck found unsound and not suitable for roofing. Do not commence work until conditions are documented and the Consultant rules on the acceptability of surfaces and/or corrective measures required. The cost of any delays due to postponement of work that results from investigating the site problem or obtaining a ruling will be at the Owner’s expense.

.2 The commencement of work is proof that the Contractor has accepted surfaces as satisfactory and accepts responsibility for appearance and performance of completed work.

.3 Defective work resulting from application of material on unsatisfactory surfaces will be considered the responsibility of the Contractor.

.4 The Contractor will be responsible for all repairs, costs and pay all cost and fees required to rectify damage or defective work. Use materials and finish to match the original preconstruction conditions.

1.15 DAILY OPERATIONS

.1 Unless otherwise specified, complete the entire roofing operation up to line of termination of each day's work, as required by design intent, in order to safeguard and protect the work and building from damage and weather.

1.16 EXAMINATION

.1 Before proceeding with roofing application, ensure that:

.1 All surfaces are clean and free of debris, snow, frost and moisture.

.2 The deck is clean and sufficiently dry to ensure specified adhesion will be obtained.

.3 Adjacent construction and installation of related work (i.e. curbs, drains, penetrations, wood nailers, etc.) incorporated with the roof are complete.

.4 Roof deck is sound, existing fasteners are tight and irregularities are corrected to provide a suitable surface for new roofing.

.2 Ensure substrate is smooth. Remove sharp edges or protrusions that could impair the function of the roof assembly.

.3 Inform Owner/Consultant in writing of any defects.

1.17 DRAINS AND DRAINAGE PLANE

.1 Inspect surfaces and ensure that roof deck is level or sloped to drains in conforming to design intent.

.2 Inspect surfaces and ensure that roof drains are set at a level to drain and are connected or capped.

.3 Ensure plumbing is accessible and work can be completed as specified.

.4 Inspect roof drains to ensure they are open and working properly.

1.18 EXAMINE UNDERSIDE OF DECK

.1 For drain alterations and pipe hangers, coordinate with plumbing subtrade as per Section 22 05 11 – Plumbing and Drainage, prior to commencement of roofing operations.

1.19 HIDDEN SERVICES

.1 Investigate the location of all known hidden services by reviewing interior conditions, plans, specifications and drawings for the original building, any subsequent alterations, completion of cut tests and interviewing those involved in the construction and maintenance of building services. These services include but are not limited to mechanical, electrical, cable, communication, computer, security or roof assembly. Ensure all services are located and will be protected from damage under the Contract. In some cases, services may be located over the roof deck and within the roof assembly. Notify Owner/Consultant in such occurrence and proceed with installation as directed.

1.20 EQUIPMENT

.1 Inspect equipment affected by the work, including but not limited to rooftop equipment, curbs, existing drains and plumbing, mechanical, electrical and lightening protection services, to ensure they are in good repair and working order. Record any damage and advise the Consultant.

.2 During re-roofing, ensure that all mechanical equipment, etc. are properly supported.

.3 Notify Owner and/or Consultant of any equipment which is not operational or damaged prior to the commencement of work.

1.21 ADVISE CONSULTANT

.1 Advise the Consultant of any unusual circumstances affecting the work. Notify the Consultant of any defective or malfunctioning equipment or drainage deficiencies. Do not commence work until defects and incorrect levels have been verified and rectified.

1.22 PROTECTION OF ROOFTOP EQUIPMENT

.1 Remove any equipment and flashing intended for re-use and save from harm. Store in approved location and reset at project conclusion unless specified or shown to be removed.

.2 Protect all openings, vents and stacks from weather and contamination from debris.

.3 Provide temporary plumbers plugs to protect drains during roofing operations. Ensure that temporary protection is removed at completion of work period and/or at the end of each day’s work.

1.23 SERVICES

.1 Services are to be left operational unless otherwise authorized by the Owner.

.2 Unless otherwise specified, the Contractor will be responsible for disconnection, relocation, re-installation and extending all services required to facilitate work

under this Contract. Co-ordinate work with the Owner and provide minimum of 48 hours notification if services are to be interrupted.

.3 Contractor to verify location of services prior to commencement of work. Notify Owner/Consultant of any unusual conditions.

.4 The Contractor and their employees must hold valid certificates for the work undertaken.

.5 Complete work of this Section as required by local authorities having jurisdiction. Have work inspected and pay all fees relative to such inspection to ensure work meets with published standards and codes.

.6 Submit Certificate or Letter of Approval by authority responsible for the work to the Owner and Consultant with final documentation.

.7 All fans, air handling units, and any electrical equipment affected by the replacement of the roof sections under this Section, whether disconnected or extended must be inspected by an ESA representative to verify the integrity of the existing wiring and/or the new installation.

1.24 WARRANTY

.1 Contractor's Warranty for Labour and Material:

.1 For Work of this Section 07 52 00 – Modified Bituminous Membrane Roofing, 12-month warranty period is extended to 24 months.

.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 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.

.2 Manufacturer's Warranty:

.1 Provide a 10-year membrane warranty.

Part 2 Products

2.1 GENERAL

.1 All standards, regulations and specifications listed herein are considered to be the latest available edition.

.2 For sealants, mastic, adhesives or caulk, refer to Section 07 92 00 – Joint Sealants.

2.2 PRIMERS

.1 Asphalt Primer: To manufacturer's recommendations.

.2 Self-adhesive membrane primer. As recommended by membrane manufacturer. Use low VOC, polymer emulsion-based primer, unless directed otherwise by Consultant on site.

2.3 AIR/VAPOUR BARRIER MEMBRANE

.1 For concrete decks:

.1 Torch grade modified bituminous air/vapour barrier, with polyester or glass fleece reinforcement, minimum thickness 3 mm, top side sanded, having nominal weight of 180 g/m².

.1 Type 2.

.2 Class C - plain surfaced.

.3 Grade 1 - standard service.

.4 Top and bottom surfaces: sanded/polyethylene.

2.4 SELF-ADHERED MEMBRANE

.1 To CSA A123.22, self-adhering membrane consisting of SBS rubberized asphalt compound laminated to a polyethylene film. Minimum thickness 1 mm.

.1 Standard of acceptance or approved equivalent:

.1 Blueskin SA by Henry Bakor.

.2 GoldShield by IKO.

.3 Soprastick 1100 by Soprema.

2.5 MEMBRANE AND MEMBRANE FLASHINGS

.1 Acceptable membrane manufacturers:

.1 Soprema Group.

.2 IKO Industries Ltd.

.3 Henry Bakor.

.4 John's Manville.

.2 Base sheet membrane and base sheet membrane flashing (non-combustible substrates): To CGSB 37-GP-56M.

.1 Styrene-Butadiene-Styrene (SBS) elastomeric polymer polyester reinforcement, having nominal weight of 180 g/m^2.

.2 Type 2.

.3 Class C - plain surfaced.

.4 Grade 1 - standard service.

.5 Top and bottom surfaces:

.1 polyethylene/polyethylene.

.3 Self-Adhesive base sheet membrane flashing (combustible substrates): To CGSB 37-GP-56M.

.1 Styrene-Butadiene-Styrene (SBS) elastomeric polymer prefabricated sheet, polyester and glass reinforcement.

.2 Type 2, adhered.

.3 Class C - plain surfaced.

.4 Grade 2 – heavy duty service.

.5 Top and bottom surfaces:

.1 Polyethylene/release paper.

.4 Cap sheet membrane and membrane flashing: To CGSB 37-GP-56M

.1 Styrene-Butadiene-Styrene(SBS) elastomeric polymer, prefabricated sheet, 250 g/m^2.

.2 Type 1.

.3 Class A-granule surfaced.

.1 Colour for granular surface: Gray.

.4 Grade 1-standard service.

.5 Bottom surface polyethylene.

.5 Fireguard Tape

.1 Modified bituminous membrane supplied in strips, 150 mm wide, 1.6 mm thick, glass fleece reinforced with self-adhesive underside.

.2 Standard of acceptance or approved equivalent:

.1 Sopraguard by Soprema.

2.6 SLOPED INSULATION (INORGANIC)

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

.2 Insulation slopes shall be as indicated on the detailed drawings and roof plans. Modules shall be factory cut to correct slopes.

.3 Sloped insulation must terminate at 0 thickness. Supply an additional nosing piece if required, factory fabricated of compatible, flame-resistant sloped rigid insulation material, to smoothly terminate sloped insulation at 0 thickness.

2.7 ADHESIVES

.1 Adhesive for securing protection board and insulation: To be fully compatible with all materials in the roofing assembly. Applicability of use to adhere the different materials in the roofing assembly to be included in the manufacturer's literature.

.1 Standard of acceptance or approved equivalent:

.1 Thermostik 880-33 by Henry Bakor

.2 Duotack by Soprema

.3 Millenium by IKO

.4 Fas-n-free or Elite by Tremco

.5 Insta-Stick by Instafoam Inc.

.6 Roof Assembly Adhesive by Chemlink

2.8 PROTECTION BOARD

.1 Protection Board: 6 mm thick asphalt based protection board with non-woven glass facers, as recommended by the membrane manufacturer.

2.9 POLYSTYRENE INSULATION

.1 Extruded polystyrene (XPS) insulation to CAN/ULC-S701, Type 4, thickness as indicated on drawings. Where indicated, provide drainage grooves on underside of board. Edges to be shiplapped unless otherwise indicated.

2.10 SEMI-RIGID MINERAL WOOL INSULATION

.1 Semi-rigid mineral wool, rockwool, or slagwool boards, to CAN/ULC 702.2.

2.11 SEALERS

.1 Plastic cement: Asphalt, to CAN/CGSB-37.5.

.2 Sealants: See Section 07 92 00 - Joint Sealants.

2.12 BALLAST

.1 Re-use existing stone ballast. Sieve existing materials ensuring all existing ballast is cleaned of all soils and particles smaller than 9 mm diameter.

.2 Ballast shall comply with ASTM D448 #4, free of splinters and fines, with typical size of stone being between 38 mm diameter and 19 mm diameter.

.3 Ballast requirement:

.1 Perimeter zone (defined as the roof section parallel to the exterior roof edge a minimum width of 2400 mm), 0.75 kPa (75 kg/m²).

.2 Corner zone (defined as a 2400 mm x 2400 mm at the exterior corner of the roof), 1.0 kPa (100 kg/m²).

.3 Field and penetration zone (defined as the main portion of the roof section that is not part of the perimeter and corner zone), 0.75 kPa (75 kg/m²).

2.13 FILTER FABRIC

.1 Woven fabric, polyolefin, black, permeable to water, resistant to ultraviolet rays, to interposed between the insulation and ballast. Fabric must be approved by the manufacturer of the insulation.

2.14 CONCRETE PAVERS

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

2.15 FASTENERS

.1 Vertical membrane flashing fasteners: Spiral nails, screws or masonry anchors with 25 mm solid caps. Minimum length 38 mm. Corrosion resistant.

.2 Fasteners for exposed metal flashing and cladding to wood or steel: Minimum 38 mm #10 cadmium plated hex head screws, colour matched, with neoprene and steel washers.

.3 Fasteners for sheet metal and wood to wood: Corrosion resistant #10 wood screws or nails to suit application.

2.16 PLUMBING VENTS

.1 2-piece spun aluminum with integral flange, diameter to suit existing pipe size.

.1 Standard of acceptance or approved equivalent:

.1 Flash-tite by Lexcor, EVF-1 by Thaler.

2.17 ROOF DRAINS

.1 See Section 22 05 11 – Plumbing and Drainage.

2.18 ROOF ACCESSORIES

.1 Door sill: Extruded aluminum, width to suit opening.

.1 Standard of acceptance or approved equivalent:

.1 CT Series by KN Crowder.

.2 Pile weatherstripping: Vinyl and pile, external attachment to door sill, adjustable.

Part 3 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.

.2 Do priming in accordance with manufacturer’s written recommendations.

.3 Fit the interface of all walls and roof assemblies with durable rigid material sheet metal or plywood providing connection point for continuity of air barrier.

.4 Make assembly, component and material connections in consideration of appropriate design loads, with reversible mechanical attachments.

.5 In the event that any product contains a manufacturing defect or anomaly, the Contractor shall notify the Consultant and manufacturer immediately and request direction.

3.2 REMOVAL OF EXISTING ROOFING

.1 Remove all roofing, flashing and insulation materials down to deck. Leave existing blocking and parapet construction in place where indicated. Where a built-up air/vapour barrier is present, remove this from the deck unless agreement is otherwise obtained from the Consultant to leave in place.

3.3 EXAMINATION OF ROOF DECKS

.1 Verification of Conditions:

.1 Inspect with Consultant substrate conditions including parapets, construction joints, roof drains, plumbing vents and ventilation outlets to determine readiness to proceed.

.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 Roof drains have been installed at proper elevations relative to finished roof surface.

.4 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 or when such weather is imminent.

3.4 MECHANICAL EQUIPMENT DISCONNECTION / MODIFICATION / RECONNECTION

.1 Perform disconnection, extension, modification, and reconnection of mechanical equipment in accordance with drawings provided. Obtain approval from Consultant prior to making adjustments not scheduled.

.2 In general, Contractor is responsible for disconnection extension, modification, and reconnection of all operating HVAC equipment in work area. Owner is responsible for disconnection (at interior) of those mechanical items indicated for removal by Contractor.

.3 All mechanical equipment must be properly tagged out of service (especially where gas is present). ESA certificates are required for all mechanical and electrical reconnections.

3.5 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 Protect roof from traffic and damage. Comply with precautions deemed necessary by Consultant.

.4 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.

.5 Metal connectors and decking will be treated with rust proofing or galvanization.

.6 Fit the interface of the walls and roof assemblies with durable rigid material sheet metal or plywood providing connection point for continuity of air barrier.

3.6 PRIMING

.1 Unless otherwise indicated or directed by Consultant, prime all surfaces which will be in direct contact with bituminous materials at the rate of 0.15 L/m^2 to manufacturer’s recommendations. For self-adhering membrane, install primer at a rate recommended by manufacturer. Ensure that surfaces are tack-free before proceeding.

.2 Limit quantity of primer at deck openings and points of termination and provide supplemental protection to prevent bleedthrough to the building interior.

.3 Roll primer into surface.

.4 Re-prime all surfaces, including pre-primed surfaces, that become contaminated with dust or become marred due to their exposure to roof traffic or weather.

3.7 TORCH-APPLIED AIR/VAPOUR BARRIER ON CONCRETE DECK

.1 Ensure all surfaces to be covered with self-adhering membrane are complete and free of moisture and contaminants and surfaces are above 5°C (40°F). At temperatures below 5°C (40°F) heat materials to be covered with hot air gun. Store all materials in heated storage when temperatures fall below 5°C (40°F) and remove only as much material that can be used before cooling.

.2 Prime all vertical surfaces to be covered with torch-applied membrane, and horizontal surfaces as required. Use roller application – no spray application permitted. Let primer tack dry and complete thumb test to test set-up.

.3 Use fireguard tape or protection board to protect all open joints in substrate and all combustible surfaces.

.4 Working up slope from drain, install air/vapour barrier membrane using torch methods, true to line to completely cover the area intended to be protected to points shown on the drawing.

.5 Membrane is to be installed without air blisters and wrinkles. Rework, repair or replace all poorly installed membrane. Do not stretch material that would result in pullback and deformity of the membrane at intersections.

.6 Lap all side laps 75 mm and end laps 150 mm. Torch all seams to achieve bleedout. At nailable surfaces, secure all membrane on vertical surface at points of termination at 150 mm c/c, using large head roofing nails.

.7 Turn up membrane 150 mm at edge where horizontal surface meets vertical planes. Lap onto existing surfaces as required to provide continuity of air/vapour barrier at terminations. Use fireguard tape or protection board to protect all open joints in deck and all combustible surfaces

.8 Seal all points of termination at horizontal planes and vertical surfaces with modified sealant. Tool sealant to consistent smooth and even surface.

.9 Seal all perimeters and penetrations, and ensure drains are operational and prevent backflow, if air/vapour barrier is to be left exposed as an overnight temporary waterproofing.

3.8 SLOPED INSULATION – ADHESIVE ADHERED

.1 At all locations of sloped insulation provide shop drawings from sloped insulation manufacturer for Consultant's review prior to installation.

.2 Install sloped insulation layer over air/vapour barrier to specified design intent and thickness. Secure insulation laid with adhesive, in pattern as per adhesive manufacturer's directions and as indicated. Apply boards before adhesive cures, skims over or loses adhesive qualities.

.3 For subsequent layers of insulation, secure insulation laid with adhesive, in pattern as per adhesive manufacturer's recommendations and as indicated.

.4 Stagger all joints of insulation a minimum 300 mm.

.5 Stagger both end and side joints between insulation layers.

.6 Butt sheets of insulation with moderate contact. Do not force insulation into place. Cut neatly at projections and points of termination. Replace all broken, damaged or misfit boards as work progresses.

.7 Where necessary, back-cut insulation to allow it to conform and stay bonded to irregular surfaces without bridging. Subsequent to placement, walk insulation into place to ensure positive bonding is achieved.

3.9 PROTECTION BOARD

.1 Adhere protection board to sloped insulation with adhesive at the rate and pattern specified, as for insulation.

.2 Place boards in parallel rows with end joints staggered. Tape joints in protection board with fireguard membrane where combustible surfaces are directly below.

.3 Where protection board is specified on nailable vertical surfaces, secure protection board using large-head roofing nails at 200 mm centres each direction and tape all joints with fireguard tape.

3.10 MODIFIED BITUMINOUS MEMBRANE - GENERAL APPLICATION

.1 Inspect and seal all substrates to eliminate fire hazard. Use fireguard tape as required or recommended by manufacturer.

.2 Mechanical spreaders are not permitted to install modified membranes.

.3 Use only bitumen, sealants, adhesive or mastics as specified by membrane manufacturer. Provide written approval from manufacturer when proposing any alternatives or substitutions.

.4 Lay out all sheets as to allow them to relax a minimum of 30 minutes. When temperatures are below 4.4°C keep and lay out rolls in heated storage. Install rolls before temperature fallback of the sheet occurs.

.5 Roof membrane to be installed in one sheet if possible.

.6 Lay all membrane starting at low point to ensure that seams do not face water flow. Roll all membrane into place, true to line, free of buckles, air pockets, fishmouths and tears.

.7 Overlap all end laps minimum 150 mm and side laps 75 mm.

.8 Offset all side laps between plies by 50%.

.9 Offset all end laps between plies minimum 1200 mm.

.10 At valley locations, run membrane continuously with the slope of the main roof. Lay out all sheets to ensure minimum side laps are maintained through valley area and short section of roof beyond. At these locations the side laps for the main roof will increase. Install membrane to details and Consultant’s direction onsite.

.11 Ensure that a watertight seal is achieved at all overlaps and points of termination.

.12 Carry base sheet flashing over face of building as shown on the drawings.

.13 Carry membrane up all vertical surfaces to point shown. Cut off corners at 45° at end laps to be covered by the next roll prior to installation of following sheet.

.14 Verify procedure with Consultant on site. Seal fasteners through membrane immediately with Type 'A' sealant.

.15 Do not walk on membrane during applications and until sufficient cooling has taken place as to allow for traffic without doing damage or marking surface.

3.11 MEMBRANE APPLICATION

.1 In accordance with Summary of Work, drawings and details, install new membrane and flashings system.

.2 Install all membrane in strict accordance with manufacturer's latest printed instructions and application methods.

3.12 BASE SHEET (TORCH APPLICATION)

.1 Install 1-ply base sheet membrane running with the roof slope, starting at the low point. Layout roll in place to verify alignment and proper overlap and re-roll prior to torching.

.2 Fully torch in place base sheet membrane using proper application techniques as specified by membrane manufacturer.

.3 Install membrane true to line and free of wrinkles, air pockets, voids, excessive bitumen flow or other irregularities. Ensure the membrane is not overheated at any location. Should any of these conditions occur, immediately stop membrane application and correct the deficiency before proceeding. Notify Consultant and obtain his approval for proposed repair methods. Questionable areas will require to be cut out and replaced.

.4 Ensure that a watertight seal of all membrane joints and points of termination is achieved with a torch and trowel.

.5 Terminate base sheet up all verticals 50 mm, secure on vertical with 38 mm nails with 25 mm metal heads at 225 mm c/c.

.6 Review base membrane for low areas (ponding) and correct with additional base sheet membrane.

3.13 BASE SHEET FLASHINGS (TORCH APPLICATION)

.1 All flashings to be cut across the roll in 1 m sections. Cut off corners at end laps to be covered by next flashing piece.

.2 Provide chalk lines and install all membrane true to line. Install gusset reinforcement pieces at all corner locations.

.3 Commence flashings from the drain or low points and overlap all side laps minimum 75 mm. Base sheet flashings to extend 100 mm onto roof surface and terminate as shown in drawings.

.4 Install membrane by softening both contact surfaces simultaneously with recommended torching equipment. During application, unroll membrane slowly into fluid bitumen ensuring consistent 6 mm flow protrudes each side of the roll.

.5 Unroll and work sheet into place using torch, trowel and wet sponge to ensure proper placement and adhesion.

.6 Install membrane true to line and free of wrinkles, air pockets, voids, excessive bitumen flow or other irregularities. Ensure the membrane is not overheated at any location. Should any of these conditions occur, immediately stop membrane application and correct the deficiency before proceeding. Notify Consultant and obtain his approval for proposed repair methods. Questionable areas will require to be cut out and replaced.

3.14 CAP SHEET (TORCH APPLICATION)

.1 Prior to installation, unroll the cap sheet and check for granular embedment width and alignment.

.2 Layout membrane to ensure side lap of cap sheet does not occur within 150 mm of roof drain.

.3 Install specified cap sheet membrane running with the roof slope, starting at the low point. Layout roll in place to verify alignment and proper overlap and re-roll prior to torching. Offset cap sheet side laps 50% to base sheet side laps, ensure lap does not lie within 150 mm of a roof drain.

.4 Install 1-ply cap sheet membrane full torched in place using proper application techniques as specified by the membrane manufacturer.

.5 Install membrane by softening both contact surfaces simultaneously with recommended torching equipment. During application, unroll membranes slowly into fluid bitumen ensuring consistent 3 mm to 6 mm flow protrudes each side of the roll.

.6 Install membrane true to line and free of wrinkles, air pockets, voids, excessive bitumen flow or other irregularities. Ensure the membrane is not overheated at any location. Should any of these conditions occur, immediately stop membrane application and correct the deficiency before proceeding. Notify Consultant and obtain his approval for proposed repair methods. Questionable areas will require to be cut out and replaced

.7 Using a torch and trowel, embed granules at end laps and where required on surface of cap sheet to ensure proper bonding of membrane overlaps.

3.15 CAP SHEET FLASHINGS (TORCH APPLICATION)

.1 All flashings to be cut across the roll in 1 m sections. Cut off corners at end laps to be covered by next flashing piece.

.2 Provide chalk lines and install all membrane true to line. Install base sheet gusset reinforcement at all corner locations.

.3 Commence flashings from the drain or low points and overlap all side laps minimum 75 mm. Cap sheet flashings to extend 150 mm onto roof surface and terminate as shown in drawings. At wall locations, unless otherwise specified, cap sheet flashings to extend up 50 mm higher than base sheet flashings.

.4 Where required by Summary of Work and details, install 50 mm wide continuous strip of Type 'A' sealant to the tops of parapets or eaves to prevent bitumen spillage on the building exterior.

.5 Install membrane by softening both contact surfaces simultaneously with recommended torching equipment. During application, unroll membrane slowly into fluid bitumen ensuring consistent 6 mm flow protrudes each side of the roll.

.6 Unroll and work sheet into place using torch, trowel and wet sponge to ensure proper placement and adhesion.

.7 Install membrane true to line and free of wrinkles, air pockets, voids, excessive bitumen flow or other irregularities. Ensure the membrane is not overheated at any location. Should any of these conditions occur, immediately stop membrane application and correct the deficiency before proceeding. Notify Consultant and obtain his approval for proposed repair methods. *Questionable* areas will require to be cut out and replaced.

.8 Touch up bare spots, corners, scuffs and bleedout runs on cap sheet with granules matching membrane colour, immediately following installation. Use hot air welder, torch or Type 'A' sealant to adhere granules to sheet.

3.16 ROOF DRAINS

.1 See Section 22 05 11 – Plumbing and Drainage for plumbing work.

.2 Install self-adhered membrane air seal around drain and extend onto air/vapour barrier minimum 150 mm.

.3 Complete roof membrane, installing additional 1 m x 1 m base sheet flashing centred over drain opening.

.4 Fully coat drain flange to receive roofing with modified sealant and continue modified bitumen over flange. Neatly trim and work membrane to interior face and seal with Type 'A' sealant.

.5 Set clamping ring in solid bed of Type 'A' sealant. Secure clamp ring and integral screen as dictated by drain design immediately after membrane is installed. Tighten bolts to ensure a permanent watertight compression seal.

.6 Install and bolt strainers with heavy iron mechanical bracket to ensure the drain screen remains permanently in place to the Consultant's approval.

.7 Install test plug, water test roof and repair leaks. Remove test plug once complete.

.8 Restore interior finishes affected by work of this Contract to match original materials and finishes to Consultant's approval. Insulate rainwater leader. pipes as required by Summary of Work in accordance with Section 22 05 11 – Plumbing and Drainage.

3.17 PLUMBING VENTS, STACKS AND SLEEVES

.1 Inspect and clean soil pipes of debris to ensure they are operational.

.2 Protect exposed surface during roofing operation and clean surfaces free of bitumen before leaving site.

.3 Make all penetrations air and watertight at air/vapour barrier by installing self-adhesive membrane flashings 150 mm onto air/vapour barrier and carry up and around projection. Clamp in place and caulk.

.4 Trim base sheet at roof projections.

.5 Adjust existing pipes to new flashing heights by either cutting down or extending pipes with matching materials attached with mechanical couplers. Ensure pipes are 38 mm higher than flashing to allow for sealing to prevent condensation.

.6 Clear all projections free of contaminants and seal junction of base sheet and roof projections with trowel applications of sealant as shown on drawings.

.7 Install all metal flanges to be built into the membrane before the installation of cap sheet. Insulate sleeves in accordance with drawings as specified. Where required, install telescoping caps to detail.

.8 Prime topside and underside of all flanges to be incorporated with roofing prior to application. Use primer supplied by the membrane manufacturer. All primer to be dry before installation of membrane roofing or flashing.

.9 Before installing flashings, install 1-ply base sheet extending to opening. Set flanges in bed of Type 'A' sealant prior to membrane installation, as per manufacturer's recommendations.

.10 Install 1-ply of base sheet flashings thermofused to the flange to within 25 mm from upturn and continuing a minimum of 225 mm beyond flange. Continue cap sheet to metal upturn. Seal around upturn junction with sealant and touch up with matching granules, as per manufacturer's recommendations.

3.18 INSULATION AND BALLAST – PROTECTED

.1 Install insulation to thickness as required within the specification and shown on the drawings.

.2 Lay insulation loose laid in parallel courses with long joints running with the drainage plane. Stagger end joints. Lay board with moderate contact without forcing joints. Bevel as required and cut to fit cants and projections.

.3 Cover entire insulation area with filter fabric, cut to fit projections and lapped a minimum of 300 mm at all lap joints. Lay fully flat without wrinkles and extend up all flashing locations a minimum of 100 mm.

.4 Apply ballast over the installed insulation. Apply to a depth of 100 mm, 1200 mm wide at all perimeter and flashing locations and to 75 mm depth in the field of the roof.

.5 Rake surfaces to remove all uneven areas and to remove any debris or other deleterious materials.

3.19 CONCRETE PAVERS

.1 Install concrete pavers where shown to requirements of Summary of Work, drawings and details.

.2 Set pavers on rubber protection pad, in turn on walkway membrane cap sheet.

3.20 CLEAN UP

.1 At all times, keep the premises free from accumulation of waste materials or rubbish. Stock piling of debris on the roof will not be permitted.

.2 Repair defects in surface and bitumen runs with granules to match existing to leave the roof in an even consistent finish.

.3 Leave roof clear of debris and bitumen left by spills and machine tracking.

.4 Leave grounds and building free of debris and bitumen spread by pedestrian traffic where applicable.

.5 Clean surfaces and penetrations of all contaminants and touch up to the satisfaction of the Owner. Include rooftop equipment, curbs, soil stacks, sleeves, gas lines, vents, drains and ladders.

.6 Check drains to ensure they are functional and where required remove all debris by vacuum.

.7 At the completion of the work remove all rubbish, tools, equipment and surplus materials.

.8 Be responsible to repair and pay all costs and fees required to rectify damage caused by work of the Contract with materials and finish to match original.

END OF SECTION

Part 1 General

1.1 RELATED SECTIONS

.1 Section 06 10 00 - Rough Carpentry.

.2 Section 07 52 00 - Modified Bituminous Membrane Roofing.

.3 Section 07 92 00 – Joint Sealants.

1.2 REFERENCES

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

.1 ASTM A653/A653M-13, Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.

.2 ASTM D523-08, Standard Test Method for Specular Gloss.

.2 Canadian Standards Association (CSA International)

.1 CSA B111-1974(R2003), Wire Nails, Spikes and Staples.

.3 Canadian General Standards Board (CGSB)

.1 CAN/CGSB-1.108-M89, Bituminous Solvent Type Paint.

.4 Canadian Roofing Contractors Association (CRCA)

.1 Roofing Specifications Manual 1997.

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

.1 Material Safety Data Sheets (MSDS).

.6 SMACNA – Architectural Sheet Manual – 1993 Edition.

1.3 COORDINATION

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

1.4 EXAMINATION

.1 Do not commence work until surface to be covered has been inspected.

.2 Inspect work and advise the Consultant of conditions that would adversely affect the work of this trade.

.3 Commencement of work is proof that the Contractor has accepted surfaces as satisfactory for intended operations and accepts responsibility for appearances and performance of completed work.

.4 Repair damaged and inferior work caused by work of this Contract with materials and finish to match original to the Consultant’s approval.

1.5 SUBMITTALS

.1 Submit to the Consultant a list of materials intended for use before they are ordered.

.2 Product Data:

.1 Submit manufacturer's printed product literature for sheet metal flashing systems materials, specifications and datasheet and include product characteristics, performance criteria, physical size, finish and limitations.

.2 Submit copies of WHMIS MSDS - Material Safety Data Sheets

.3 Samples:

.1 Submit duplicate 50 x 50 mm samples of each type of sheet metal material, finishes and colours.

1.6 DELIVERY, STORAGE AND HANDLING

.1 Deliver, store and handle materials in accordance with manufacturer's written instructions.

.2 Safety: Comply with requirements of Workplace Hazardous Materials Information System (WHMIS) regarding use, handling, storage, and disposal of materials.

.3 Manufacturer’s recommendations for handling and storing products are to be considered a minimum requirement.

.4 Materials shall be delivered to the site, undamaged and in their original packages, with manufacturer’s labels visible, attesting to their conformity to specific standards.

Part 2 Products

2.1 PREFINISHED SHEET METAL FLASHING

.1 Pre-finished metal flashings: As shown on drawings, fabricate from.51 mm (26 ga.) steel to ASTM A653 Grade 230 with G90 zinc coating. Surface with Perspectra Series baked enamel finish. Colour to match existing from manufacturer’s standard colour range.

2.2 ACCESSORIES

.1 Metal cleat: 0.71 mm (24 ga.) galvanized steel, 50 mm wide @ 600 mm c/c.

.2 Continuous metal starter strip: 0.71 mm (24 ga.) galvanized steel, secured at 400 mm c/c.

.3 Use galvanized, copper, aluminum or stainless steel nails or screws as most compatible with materials and preservatives being utilized.

.4 Nails: Annular threaded nails of length to penetrate into bases minimum 25 mm. No. 8 screws to penetrate wood 19 mm at 600 mm c/c.

.5 Masonry fasteners: Tapcon, Permagrip or Tapgrip or Rawl. Spike sized to penetrate concrete 38 mm minimum as specified or shown.

.6 Exposed fasteners: Where exposed fasteners are specified or as shown, use #10 screws with metal and neoprene washers pre-finished to match colour of flashing. Alternatively, use screws with colour match nylon caps where shown or approved by the Consultant.

.7 Screws for starter strips and fascia: #8 @ 400 mm c/c.

.8 Wedges: Rolled plumber sheet lead.

.9 Sealant: Refer to Drawings and Section 07 92 00 – Joint Sealants.

.10 Bitumen paint: To CAN/CGSB-1.108 Type II. Gilsonite asphalt paint.

.1 Acceptable product: 810-07 by Henry or approved equivalent.

.11 Touch-up paint: As recommended by prefinished material manufacturer.

2.3 FABRICATION

.1 Fabricate metal flashings and other sheet metal work in accordance with applicable details, as indicated. Where not indicated, follow applicable CRCA 'FL' series details.

.2 Metal shall be formed on a bending brake, shaping trimmed and hard seaming shall be done on bench, as far as practicable, with proper sheet metal working tools. Angles of bends and folds for interlocking metal shall be made with full regard to expansion and contraction to avoid buckling and to avoid damaging metal surfaces.

.3 Fabricate all possible work in shop in maximum 2400 mm lengths by brake forming, bench cutting, drilling and shaping. Match existing profiles where metal flashing is to be repaired.

.4 Hem exposed edges on underside 13 mm. Mitre and seal corners with sealant.

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

.6 Dry joints are to be tight but not dented so as to permit slight adjustments of sheets and yet remain watertight.

.7 Lock seams at all corners.

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

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

Part 3 Execution

3.1 MANUFACTURER'S INSTRUCTIONS

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

3.2 SHEET METAL FLASHING INSTALLATION

.1 Install sheet metal flashings at copings, walls, expansion joints, roof openings and other components required to protect the membrane flashings as shown on the drawings or otherwise required. Where not indicated, follow applicable CRCA 'FL' series details.

.2 Install continuous concealed starter strips at all exterior faces. Install cleats between lock joints and as indicated to permanently hold flashing in place. Install hook strip fasteners with 2 fasteners per cleat.

.3 Sheet metal work shall be installed to cover the entire area it protects and shall be watertight under all service and weather conditions. Install in a uniform manner, true to line, free of dents, warping and distortion.

.4 Back-paint sheet metal that comes into contact with another kind of metal, masonry or concrete with bituminous paint at the rate of 0.15 L/m^2.

.5 Install sheet metal with concealed fasteners at lock joints. Exposed fastening will only be permitted with the approval of the Consultant. When exposed fasteners are shown, space all fasteners evenly in an approved manner. Use lead plugs and screws with neoprene washers where fasteners are exposed, otherwise use concrete drive fasteners where metal flashings are installed over concrete masonry.

.6 Join sheet metal by "S" lock seams, to permit thermal movement. Seal all fasteners and completely fill all joints with Type 'B' sealant as flashing is being installed. Clean off all excessive visible material subsequent to installation.

.7 When flashing is being installed in more than one piece, offset joints in adjacent flashings by approximately 50%.

.8 Form inside and outside corners by means of locked seams. Do not use pop rivets unless accepted by Consultant.

.9 Slope all metal to interior of roof area to maintain slope, unless otherwise indicated. Do not form open joints or pockets that fail to drain water.

3.3 CLEANING

.1 On completion and verification of performance of installation, remove surplus materials, excess materials, rubbish, tools and equipment. Remove and replace all sheet metal sections that received surface damage or scratches during fabrication, delivery or installation.

.2 For scratches and scuffs to be retained in the new installation, use touch up paint recommended by the metal material supplier.

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

END OF SECTION

Part 1 General

1.1 RELATED SECTIONS

.1 Section 06 10 00 - Rough Carpentry.

.2 Section 07 52 00 - Modified Bituminous Membrane Roofing.

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

.4 Section 22 05 11 – Plumbing and Drainage.

1.2 REFERENCES

.1 Canadian General Standards Board (CGSB)

.1 CAN/CGSB-19.13-M87, Sealing Compound, One Component, Elastomeric, Chemical Curing.

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

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

.1 Material Safety Data Sheets (MSDS).

1.3 COORDINATION

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

1.4 EXAMINATION

.1 Do not commence work until surface to be covered has been inspected.

.2 Inspect work and advise the Consultant of conditions that would adversely affect the work of this trade.

.3 Commencement of work is proof that the Contractor has accepted surfaces as satisfactory for intended operations and accepts responsibility for appearances and performance of completed work.

1.5 DELIVERY, STORAGE AND HANDLING

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

1.6 ENVIRONMENTAL AND SAFETY REQUIREMENTS

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

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

.3 In confined spaces provide portable supply of outside air and exhaust fans to ensure fumes will not impact workmen or building occupants.

.4 Compatibility is essential in use of any materials that will be compatible when incorporated in finished assembly.

Part 2 Products

2.1 MATERIALS

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

.2 Modified bitumen sealant (Sealant Type 'A'):

.1 For penetration and terminations of bituminous and modified bituminous membrane: To CAN/CGSB-37.5. As recommended by membrane manufacturer.

.2 Standard of acceptance or approved equivalent:

.1 Sopramastic 200 by Soprema.

.2 MBR Flashing Cement by Johns Manville.

.3 Polybitume 570-05 by Henry Bakor.

.3 Urethanes one part (Sealant Type 'B'):

.1 Non-sag: To CAN/CGSB-19.13, Type 2, MCG-2-25, colour to match surfaces.

.2 Standard of acceptance or approved equivalent:

.1 Dymonic by Tremco.

.2 Sonolastic NP1 Ultra by Sonneborn.

.4 Preformed compressible and non-compressible back-up materials:

.1 Backer rod:

.1 Polyethylene, urethane, neoprene or vinyl foam closed cell, oversized 30 to 50 %, Shore 'A' hardness 20, tensile strength 140 to 210 kPa.

.2 Bond breaker tape:

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

2.2 JOINT CLEANER

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

2.3 PRIMER

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

Part 3 Execution

3.1 PROTECTION

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

3.2 PREPARATION OF JOINT SURFACES

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

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

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

.4 Ensure joint surfaces are dry and frost free.

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

3.3 PRIMING

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

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

3.4 BACKUP MATERIAL

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

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

3.5 APPLICATION

.1 Sealant - General:

.1 Apply sealant when air and substrate temperatures are not forecast to be less than minimum recommended by manufacturer. Do not work during inclement weather. Perform all work in accordance with manufacturer's written instructions.

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

.3 Apply sealant in continuous beads.

.4 Apply sealant using gun with proper size nozzle.

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

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

.7 Tool exposed surfaces before skinning begins to give slightly concave shape.

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

.9 The use of liquid tooling aids, such as soapy water or alcohols, are prohibited as they may impact effective sealant cure, adhesion and potentially cause aesthetic issues.

.2 Sealant Type 'A':

.1 Install sealant Type 'A' to the top of membrane flashings where required or as shown on drawings. Modified sealant to be installed around finished flashings at all protrusions including soil stacks, sleeves, pitch boxes and fasteners securing membrane to walls.

.2 Apply sealant Type 'A' with hand trowel to achieve a 25 mm width and minimum 3 mm thickness.

.3 Apply sealant Type 'A' immediately after flashings have been installed and are still warm. No membrane flashings shall be left uncovered at the end of any work period. *(Non-compliance with this mandate may result in rejection, removal and replacement of the membrane flashings to the affected area).*

.4 Trowel sealant Type 'A' in two directions to ensure proper adhesion to substrate and that all surface irregularities are filled. Tool surface of modified sealant to smooth finish.

.5 Install sealant Type 'A' at the underside of drains, metal sleeves and other location where specified on drawings.

.3 Curing:

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

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

.4 Install sealant Type 'B' at sheet metal terminations.

3.6 CLEANING

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

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

.3 Remove masking tape after initial set of sealant.

.4 Clean all contaminated surfaces to Owner's acceptance.

.5 Remove all rubbish and surplus materials from the job site on a daily basis.

3.7 PROTECTION

.1 Protect installed products and components from damage during construction.

.2 Repair damage to adjacent materials caused by joint sealants installation.

END OF SECTION

Part 1 General

1.1 RELATED SECTIONS

.1 Section 06 10 00 - Rough Carpentry.

.2 Section 07 52 00 - Modified Bituminous Membrane Roofing.

.3 Section 07 92 00 – Joint Sealants.

1.2 REFERENCES

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

.1 ASTM C547-12. Standard Specification for Mineral Fiber Pipe Insulation.

.2 American Water Works Association (AWWA).

.1 ANSI/AWWA C111/A21.11-12, Standard for Rubber-Gasket Joints for Ductile-Iron Pressure Pipe and Fittings.

.3 Canadian Standards Association (CSA International)

.1 CAN/CSA-B70-12, Cast Iron Soil Pipe, Fittings, and Means of Joining.
.2 CSA B79-08 (R2013), Commercial and residential drains and cleanouts.
.3 CAN/CSA B1800-11, Thermoplastic Nonpressure Piping Compendium.

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

.1 Material Safety Data Sheets (MSDS).

1.3 SUBMITTAL / APPROVAL

.1 Do not commence work until satisfactory installation of related work has been completed and approved.

.2 Inspect work and advise Consultant of conditions that would adversely affect the work of this trade.

.3 Commencement of work is proof that the Contractor has accepted surfaces as satisfactory for intended operations and accepted responsibility for appearance and performance of completed work.

.4 Defective work resulting from work on unsatisfactory surfaces will be considered the responsibility of those performing the work of this Section.

.5 Repair damage and inferior work caused by the work of this Contract with materials and finish to match the original to Consultant’s approval.

.6 Submit to the Consultant a list of materials intended for use before they are ordered.

.7 Provide samples of material without additional cost, to the Consultant for review as requested.

1.4 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.

Part 2 Products

2.1 MATERIALS

.1 All standards, regulations and specifications listed herein are considered to be the latest available edition.

.2 Compatibility between materials is essential. Use only materials that are known to be compatible when incorporated in a completed assembly.

.3 Copper roof drains: Soldered copper body with flat hub. Provide appropriate bearing pans, under deck clamping and hardware, as required.

.1 At existing or new drain locations: Size to match existing or 75 mm where new.

.1 Standard of acceptance or approved equivalent:

.1 Model RD-4C with flat hub by Thaler Metal Industries Inc.

.2 Drain connector:

.1 Mechanical connection using double clamp to drain body and rainwater leader.

.2 Standard of acceptance or approved equivalent:

.1 Fernco Couplings.

.4 Drain for protected membrane roof system: Roof drain with aluminum body, thickness 2.3 mm with underdeck clamp and straight exit, with 9 mm aluminum studs soldered to the drain bowl, with cast aluminum clamping ring, stainless steel gravel guard, cast aluminum dome strainer having an access gate hinged directly to the drain body.

.5 Insulation for pipes: 25 mm thick performed type mineral fibre insulation to ASTM C547.

.1 Standard of acceptance or approved equivalent:

.1 Roxul Techton 1200 or SSL II Fiberglas by Owens Corning.

.6 Insulation for underside of drain: 2-component, 1 kg density polyurethane foam as detailed.

.7 Insulation covering:

.1 Cover pipe insulation with canvas membrane wrap and paint.

.2 Where exposed, use preformed PVC.

2.2 DRAIN ACCESS DOOR

.1 New access panels shall be of galvanized steel construction with hinged openings and a decorative flange to cover the ceiling cut edges. Units shall have a factory applied white paint finish. Minimum steel thickness shall be 0.7 mm and have self-locking access.

Part 3 Execution

3.1 PREPARATION

.1 Inspect surfaces and ensure that:

.1 Roof deck is level or sloped to provide proper and complete drainage from the roofing system in conformity to design intent.

.2 Roof drains are set at a level to allow for positive drainage and are connected or capped.

.3 Plumbing is accessible and work can be completed as specified. Notify Consultant of any adverse conditions.

.4 Existing roof drains are open and functioning properly.

.5 For costing and practical purposes, location of new drains and plumbing are approximate and should be considered accurate within 3 m. Advise Consultant of variances and adjust locations as required to facilitate installation without additional cost, to the Consultant's approval.

.2 Contractor shall advise Consultant in the event that the existing system or materials do not meet current code requirements.

.3 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.

.4 Contractor to provide interior protection to all areas where plumbing work is being completed. Provide sufficient dust and debris protection for the temporary removal of ceiling tiles, and include for any supplemental clean up to return interiors to pre-construction conditions.

.5 Remove all ceiling panels and plaster finish to provide access to the work. Re-install and make good all existing finishes to match original materials and conditions. Repainting of surfaces shall include all ceiling all wall areas up to a break in plane, unless otherwise indicated on drawings.

.6 Remove and discard all existing drains and plumbing not designated for re-use. Notify Owner of any hazardous materials encountered.

3.2 INSTALLATION AT EXISTING DRAIN LOCATIONS

.1 Increase openings in structures to facilitate plumbing as required.

.2 Join pipe by means of rubber gaskets or mechanical couplings.

.3 Fill voids around drain opening on concrete or lightweight concrete decks with quick dry concrete grout flush with top and bottom of deck.

.4 Where area is inaccessible to install couplings, advise and request Consultant to obtain a ruling on acceptability. Where directed by Consultant, install anti-backflow seals to match pipe size and secure in place.

.5 Extend insulation from pipes to drain hub. Cover with pipe wrapping and finish to general standards. If blanket insulation is used, ensure that all insulation fits tight to drain hub. Seal overlaps, edges and joints with reinforced vapour proof tape suitable to permanently hold insulation in place. Alternatively, in conformance with drawings, protect hubs with spray foam insulation, minimum thickness 38 mm unless otherwise specified or shown. Provide metal protection pan over deck as detailed.

.6 If the existing pipe is not insulated, install insulation covering on horizontal and vertical sections of drainage pipes, minimum 3 m from drain. Ensure all seams are tight fitting, overlap and sealed to design intent.

.7 Install PVC covering over insulated piping where plumbing is exposed on the interior of the building.

.8 All ceilings to be restored to original condition. Suspended ceilings to be restored to original condition and painted to match existing colour and finish. If paint colour cannot be matched, entire wall or ceiling area to be painted to blend into existing room to Owner's approval.

.9 Restore all existing surfaces affected by work of this trade to match existing material and finish.

.10 Ensure each roof is provided with operational drainage at the end of each work day.

3.3 DRAIN ACCESS DOOR

.1 Cut access opening in existing finished ceiling in most optimum location to access new drain/piping or as indicated on drawings. Cut edges neatly and install hatch, ensuring that door opening is in the direction of the larger area of ceiling space to facilitate ease of future ladder use. Install hatch plumb level with decorative flange flush with ceiling and anchor in position in accordance with manufacturers printed instructions.

3.4 PLUMBING VENT MODIFICATIONS

.1 Cut down or extend existing soil stacks to a minimum height of 300 mm above finished roof surface. Extensions to match existing material and connections to be made with mechanical joint couplings.

3.5 PIPING TEST

.1 Perform water tests before restoring interior ceilings and finishes.

.2 Install plumbing line plugs below the level of connection and water test new plumbing installation. Correct all leaks.

.3 Make leaks watertight while systems are still under test. If this is impossible, remove and refit defective parts. Caulking of threaded joints will not be permitted.

.4 After leaks have been repaired, repeat tests as often as necessary to obtain approval and to ensure watertightness of each system.

.5 Correct level of drains or pipes, if roof or pipes hold water.

3.6 FINISH

.1 Reset existing ceiling finishes removed to execute work of this Contract.

.2 Restore and repair all existing surfaces affected by the work to match existing materials and finish.

.3 Re-paint entire ceiling or walls where it is required to make patching work un-disguisable with existing surfaces.

END OF SECTION