

AVAILABLE PROJECT INFORMATION
SECTION 00 31 00

1. GENERAL

1.1. SITE

1.1.1. Information in this Section is provided only to establish general description. The Contractor is responsible for visiting the site and satisfying himself as to the existing conditions, roof composition, size of roof areas, etc. before submitting his Bid.

1.1.2. Roof Section 1 has an approximate area of 2,025 ft² (188 m²). The existing roof structure and roof system are as described below.

1. Metal Roof Panels
2. Vapour Barrier
3. 2 inches (51 mm) EPS Insulation
4. 5 inches (127 mm) EPS Insulation
5. 1/2 inch (13 mm) Fiberboard Insulation
6. SBS Base Sheet
7. SBS Cap Sheet

1.1.3. Roof Section 2 has an approximate area of 750 ft² (70 m²). The existing roof structure and roof system are as described below.

1. Metal Roof Panels
2. Vapour Barrier
3. 2 inches (51 mm) EPS Insulation
4. 5 inches (127 mm) EPS Insulation
5. 1/2 inch (13 mm) Fiberboard Insulation
6. SBS Base Sheet
7. SBS Cap Sheet

2. PRODUCTS

2.1. NOT USED

3. EXECUTION

3.1. NOT USED

END OF SECTION

GENERAL REQUIREMENTS SECTION 01 00 00

1. GENERAL

1.1. SUMMARY OF WORK

1.1.1. The Work under this Contract consists of furnishing all labour, materials and equipment necessary to perform the work of the Project, as described herein and shown on the Project Drawings. The work will include, but is not necessarily limited to, the following:

1.1.1.1. Remove and discard the existing ladder.

1.1.1.2. Remove and store the existing light.

1.1.1.3. Remove and store for reuse the existing roof top HVAC units, exhaust fans, and other roof top equipment. Test and document operability prior to removal. Properly terminate all connections.

1.1.1.4. Remove and store for reuse the existing gas lines.

1.1.1.5. Remove and discard the existing gutters and downspouts.

1.1.1.6. Remove and discard the existing equipment support curbs.

1.1.1.7. Remove and discard the existing decommissioned curbs, pipe penetrations and other abandoned equipment.

1.1.1.8. Remove and discard the existing gas line supports.

1.1.1.9. Remove and discard the existing roof membrane, insulation and vapour barrier down to the metal panels.

1.1.1.10. Remove and discard the existing base flashings and stripping.

1.1.1.11. Remove and discard the existing rough carpentry as required by the contract documents.

1.1.1.12. Remove and discard the existing metal flashings and trim.

1.1.1.13. Remove and discard the existing sealant and accessories.

1.1.1.14. Inspect the metal panels and curbs for damage or other issues. Ensure the deck is dry before installation of new materials.

1.1.1.15. Infill holes and openings in the metal panels left from the removal of abandoned equipment and penetrations.

1.1.1.16. Extend all pipe penetrations.

1.1.1.17. Furnish and install new nailers and blocking.

1.1.1.18. Furnish and install new wood framed curbs.

1.1.1.19. Furnish and install new z-bars across the entire roof section.

- 1.1.1.20. Furnish and install new plywood sheathing.
- 1.1.1.21. Furnish and install new vapour barrier support panels.
- 1.1.1.22. Furnish and install new asphaltic core board on all curbs.
- 1.1.1.23. Furnish and install new vapour barrier.
- 1.1.1.24. Furnish and install new polyisocyanurate insulation.
- 1.1.1.25. Furnish and install new SBS base sheet composite panel.
- 1.1.1.26. Furnish and install new SBS cap sheet membrane.
- 1.1.1.27. Furnish and install new SBS base flashings on all curbs.
- 1.1.1.28. Furnish and install new gas line supports.
- 1.1.1.29. Furnish and install new sheet metal flashings and trim.
- 1.1.1.30. Furnish and install new pipe penetration flashings.
- 1.1.1.31. Reinstall the existing roof top HVAC equipment.
- 1.1.1.32. Test and document equipment operability.
- 1.1.1.33. Furnish and install new weather tight stainless steel fasteners to secure the roof top fans, vents and other equipment to the curbs.
- 1.1.1.34. Repaint and reinstall the existing gas lines.
- 1.1.1.35. Furnish and install new gutters and downspouts.
- 1.1.1.36. Furnish and install new concrete splash blocks below all downspouts on the roof and on the ground.
- 1.1.1.37. Furnish and install new walkway.
- 1.1.1.38. Furnish and install new roof access ladders.
- 1.1.1.39. Reinstall the existing light.
- 1.1.1.40. Install new sealant and accessories to ensure the roof system remains watertight.

1.2. WORK RESTRICTIONS

1.2.1. Special Scheduling Requirements

- 1.2.1.1. The Contractor shall have materials, equipment, and personnel required to perform the work at the site prior to the commencement of the work.
- 1.2.1.2. The facility will remain in normal operation during the entire construction period. The Contractor shall conduct his operations so as to cause the least possible interference with normal operations of the facility.

1.2.1.3. Any necessary service cutoffs, such as power, water, or HVAC must be coordinated with the Contract Administrator.

1.2.1.4. The Contractor shall be working on and around existing buildings. Do not enter the buildings without prior approval of the Contract Administrator. The existing buildings and their contents shall be kept secure at all times. Provide dust covers or protective enclosures to protect existing work that remains and material located in the building during the construction period.

1.2.1.5. Interior access to roof for the roofing project will only be granted by special permission from the Contract Administrator.

1.2.1.6. Working Hours

1.2.1.6.1. Regular working hours within the facility shall consist of an 8-hour period between 8:00 a.m. and 5:00 p.m., Monday through Friday.

1.2.2. Work Outside Regular Hours

1.2.2.1. Work outside regular working hours requires Contract Administrator approval. Make application 7 calendar days prior to such work to allow arrangements to be made by the Contract Administrator for inspecting the work in progress, giving the specific dates, hours, location, type of work to be performed, contract number and project title. Based on the justification provided, the Contract Administrator may approve work outside regular hours.

1.2.2.2. The Contract Administrator reserves the right to require that work be completed outside of regular work hours to reduce disruptions to occupants within the facility. This work will be completed on a price request basis.

1.2.3. Heavy Equipment/ Loading

1.2.3.1. Plywood sheets or other methods of load distribution must be installed prior to the use of heavy equipment.

1.2.3.2. Contractor must notify the Contract Administrator with any concerns regarding the roof loading of temporary, tools, equipment materials or other loads. Notification must be given prior to the execution of loading.

1.2.4. Utility Cutovers and Interruptions

1.2.4.1. Make utility cutovers and interruptions after normal working hours or on Saturdays, Sundays and holidays. Conform to procedures required in the paragraph "Work Outside Regular Hours."

1.2.5. Parking

1.2.5.1. Parking for workers will be allocated at the preconstruction meeting.

1.2.6. Material Storage

1.2.6.1. Materials shall be stored in areas designated by the Contract Administrator, and as allocated at the preconstruction meeting.

1.2.7. Code of Conduct

1.2.7.1. Ensure compliance with the following Code of Conduct when working onsite:

1.2.7.1.1. Compliance with all Contract Administrator established safety procedures and protocols.

1.2.7.1.2. No smoking on property, even in vehicles.

1.2.7.1.3. No rude, lewd or offensive behavior and/or comments by workers while onsite.

1.2.7.1.4. No bandanas or other clothing with colourings or markings associated with gang activity.

1.2.7.1.5. Violations of this Code will result in expulsion from work site.

1.3. CONSTRUCTION PROGRESS DOCUMENTATION

1.3.1. The Contractor shall be responsible for documenting existing site conditions prior to the start of the Work.

1.4. FIELD OR SITE CONDITIONS

1.4.1. Report any unacceptable existing conditions to the Contract Administrator immediately. Do not proceed until unsatisfactory conditions are corrected. Application of new materials shall constitute approval of the existing conditions by the Contractor.

1.4.2. Do not install waterproofing or insulating materials during any form of precipitation, including fog, or when there is ice, frost, moisture, or any other visible dampness on the substrate.

1.5. QUALITY ASSURANCE

1.5.1. Conduct a minimum of one cut test (1 ft. by 1 ft. (305 mm by 305 mm)) per 4,000 square feet (372 square meters) of roof replacement (Minimum of one cut test per roof section if less than 4,000 square feet (372 square meters) as determined by the Contract Administrator). All repairs are the responsibility of the roofing contractor. If deficiencies are identified, the Contractor will be responsible for conducting additional cut tests as directed by the Contract Administrator to determine extent of the non-compliant area.

1.6. QUALITY CONTROL

1.6.1. All items of work are to be constructed and installed by tradesmen skilled in the particular task or activity to which they are assigned. Construction failing to meet the accepted standards of workmanship will be termed Nonconforming Work and will be removed and replaced at Contractor's expense with Work conforms to the highest quality standards of the trades concerned, or otherwise corrected to the satisfaction of the Contract Administrator, the Contract Administrator, the Manufacturer, or other inspecting authority, as applicable.

1.6.2. Protect and secure the Work site and Work from loss or damage of any kind. This includes damage to materials and equipment required for the project as well as other components of the roof system. In addition, the contractor is responsible for securing any openings into the roof system that provides access to the interior of building at the end of each work day.

1.6.3. Failure of the Contract Administrator or Contract Administrator to discover or reject defective work, or work not in accordance with the Contract, shall not be deemed an acceptance thereof, nor a waiver of Contract Administrator's rights to Contractor's compliance with the Contract or performance of the work, or any part thereof. No partial or final payment, or partial or entire occupancy, by Contract Administrator shall be deemed to be an acceptance with the Contract, nor shall it be deemed a waiver by Contract Administrator or any of Contract Administrator's rights pursuant to this Contract or otherwise.

1.6.4. If the Contractor fails to maintain adequate quality control over the project, the Contract Administrator may require additional inspections of the work on a full/part time basis performed by the Contract Administrator. The cost of these additional inspections will be billed directly to the Contractor, or deducted from the Contract Amount.

1.6.5. Contractors are responsible for repairing and/or replacing all building components, equipment, furnishings, exterior grounds, fences and other exterior structures that have been damaged as result of contractor activities and/or project related moisture leakage. The Contractor is responsible for covering all related costs for services, labour and materials required to mitigate risks to occupants, make repairs and/or replace damaged materials. The Contractor is responsible to take immediate action upon notification to address the identified issues. If the Contractor fails to take immediate and/or effective action, the Contract Administrator reserves the right to complete the required work and subtract the cost for services, labour and materials from the Contract.

1.7. TEMPORARY UTILITIES

1.7.1. Contractor shall provide for temporary utilities required for the performance of the project except as otherwise noted. Such items include, but are not necessarily limited to, utilities such as heat, water, electricity and telephone.

1.8. CONSTRUCTION FACILITIES

1.8.1. Provide portable washroom facilities for workers. Contractors to ensure that no portable washroom is installed within 30 feet (9 meters) of any facility. The portable washroom must be properly secured to the security compound fence to avoid tip overs.

1.9. VEHICULAR ACCESS AND PARKING

1.9.1. Contractors can access the site and park in areas only where approved by the Contract Administrator.

1.9.2. Vehicular traffic onsite must be conducted with a spotter outside the vehicle at all times to ensure the safety of all individuals.

1.10. TEMPORARY BARRIERS AND ENCLOSURES

1.10.1. Provide a fenced compound to prevent access to work, kettles and material storage areas by unauthorized individuals.

1.11. BASIC PRODUCT REQUIREMENTS

1.11.1. Products include materials, equipment and systems.

1.11.2. Do not use materials and equipment removed from the existing structure, except as specifically required or allowed by the Contract documents.

1.11.3. Employ only new materials in manufacturer's original packaging, of the best quality, unless specific instructions are received in writing by the Contract Administrator's Representative, and apply them with the highest caliber of workmanship.

1.12. PHASED CONSTRUCTION

1.12.1. Phased installation of roofing materials is permitted on a 3-day cycle only, when no inclement weather is forecasted. Sections of the roof that are removed must be covered with the vapour barrier the same day. The rest of the roof assembly to the first waterproofing layer must be installed by the end of the third day.

1.12.1.1. On SBS roof systems, all components of the specified system up to the base sheet must be installed for the work area by the end of the third day. Cap sheet installation may follow at a later date. Base sheet must not remain exposed for more than 30 days.

1.13. PRODUCT DELIVERY, STORAGE AND PROTECTION

1.13.1. Deliver only new materials to the site, undamaged. Damaged materials will not be accepted. If damaged materials are delivered, clearly mark the damaged materials and have them removed at the earliest opportunity.

1.13.2. Test the materials upon delivery and immediately prior to installation to determine if the materials have elevated moisture levels. Materials with elevated moisture levels shall be marked as damaged and removed from the site.

1.13.3. Protect all materials from damage. Secure materials left on the site to prevent theft and vandalism.

1.13.4. Store all materials off the ground a minimum of 6 inches (152 mm) and cover with tarpaulins. Factory applied wrapping will not qualify as a covering.

1.13.5. All materials that become wet or damaged while on site shall be clearly marked and removed at the earliest convenience.

1.13.6. Store temperature sensitive materials in accordance with the manufacturer's written instructions.

1.13.7. Combustible materials are not permitted to be stored inside the facility or within 20 feet (6 meters) of the facility, or as otherwise required by the National Fire Code, Provincial Supplements and Municipal Bylaws.

1.13.8. The Contractor shall inspect all arrangements of materials stored on the project site on a weekly minimum basis.

1.13.9. All storage areas are subject to approval by the Contract Administrator.

1.13.10. Limit size of work sections to safeguard adjacent materials, structures, etc., and to minimize dust and noise.

1.13.11. Protect existing facilities from damage during work. Do not overload existing paving, curbs, sidewalks, etc. with vehicle traffic. Do not overload new or existing construction with demolition debris, equipment, etc.

1.13.12. Protect existing facilities from fire as a result of operations. Contractor shall provide suitable and adequate fire extinguishers conveniently located on the roof at staging areas, storage areas and at areas or equipment where an open flame is being used. Competent operators shall be in attendance at all times and shall be properly trained or instructed in fire protection.

1.13.13. Install a chute for the removal of materials from the roof.

1.13.14. Walls, windows, roof edges, etc., adjacent to hoists, and staging areas shall be protected using canvas tarpaulins. Plastic or felt will not be acceptable.

1.13.15. Confine roof traffic to work areas. Contractor shall be responsible for leaks that develop in traffic areas during and after project completion.

1.13.16. Protect interior of the facility from moisture intrusion and damage during roofing operations.

1.14. WARRANTY DOCUMENTATION

1.14.1. Warranty shall be for a period of two years that the roof system, as installed, is free from defects in installation workmanship, to include the roof membrane, flashing, insulation, accessories, attachments, and sheet metal installation integral to a complete watertight roof system assembly. The roof system installer is responsible for correction of defective workmanship and replacement of damaged or affected materials. The roof system installer is responsible for all costs associated with the repair or replacement work.

2. PRODUCTS

2.1. NOT USED

3. EXECUTION

3.1. NOT USED

END OF SECTION

SUBMITTAL PROCEDURES SECTION 01 33 00

1. GENERAL

1.1. ADMINISTRATIVE

1.1.1. After notification and selection for the award, the Contractor shall furnish to the Owner through the Consultant all required submittals as required in the project documents.

1.1.2. Verify field measurements and that the affected adjacent work is coordinated.

1.1.3. All text and graphics must be clear. Submittals will not be accepted if document was repeatedly faxed or copied, or drawings reduced from their original intended print size.

1.1.4. Submittals shall identify Project name and number, Contractor, Subcontractor and Supplier names. Reference and identify all submissions to specification sections and applicable paragraph numbers.

1.1.5. Submittals shall bear the Contractor's and Subcontractor's stamp and indicate approval date and signature of the person responsible for the review.

1.1.5.1. Submittals not identified, stamped, signed, dated by the Contractor and all related Subcontractor confirming to their being reviewed will be returned without being examined and shall be considered rejected.

1.1.6. Contractor shall expressly advise the Consultant in writing of any deviations in a submittal from the requirements of the Contract Documents stating reasons for deviation. The Consultant shall indicate the acceptance or rejection of such deviation expressly in writing.

1.2. SHOP DRAWINGS

1.2.1. The term Shop Drawings shall include shop drawings, setting drawings, diagrams, illustrations, schedules, performance charts, brochures and other data used by manufacturers and fabricators to detail and clarify the Work.

1.2.2. The Contractor shall furnish to the Consultant all Shop Drawings which the Consultant may deem necessary in order that the manufacturers or fabricators may clarify the details of the Work.

1.2.3. Contractor to submit, for all proposed changes, drawings stamped and signed by a professional engineer registered or licensed in the Province of Manitoba as required by the project documents.

1.2.4. Indicate materials, methods of construction and attachment or anchorage, erection diagrams, connections, explanatory notes and other information necessary for completion of Work. Where articles or equipment attach or connect to other articles or equipment, indicate that such items have been coordinated, regardless of Section under which adjacent items will be supplied and installed. Indicate cross references to design drawings and specifications.

1.2.5. When submitting Shop Drawings, Contractor shall notify the Consultant, in writing, of change made therein from the Consultant's Drawings or Specifications. Failure to clearly identify changes shall not be considered an approval of the submittal and shall be the sole responsibility of the Contractor to correct.

1.3. MANUFACTURER'S CERTIFICATES

1.3.1. Once the roof system warranty application has been submitted, Contractor shall submit the roof system manufacturer's approval letter as required by the project documents.

1.4. PRODUCT SAMPLES

1.4.1. The Contractor shall furnish for the Consultant's approval such samples as the Consultant may reasonably require. The Work shall be in accordance with approved samples. Materials, methods and finishes utilized in the Work shall at all times be consistent with the approved samples.

1.4.2. Verify prior to submission all sample submissions are current and the product will be available during the construction period. Identify any product with a limited availability time frame.

1.4.3. Samples are the property of the Owner will not be returned to Contractor.

1.4.4. Identify each sample or set of samples with imprinted text or self-adhesive type label or attached tag listing all relevant information including:

1.4.4.1. Manufacturer's name, complete product name and code.

1.4.4.2. Suppliers name and contact information.

1.4.5. Submit document confirming materials within the sample submission are in full compliance with Contract Documents.

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

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

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

1.6. ENGINEER SEALED DOCUMENTATION

1.6.1. Provide Engineered shop drawings and product data as required by the relevant Specification Sections.

1.6.2. All final documentation requiring an Engineer's seal submitted without the seal and signature on the document will be returned without review except:

1.6.2.1. Documentation submitted with a sealed covering letter listing and confirming the Engineer has reviewed the documentation in lieu of actually sealing the documents may be accepted by the Consultant provided:

1.6.2.1.1. Listed documentation is to be otherwise stamped by the Contractor as being reviewed including that they are complete, project specific and otherwise comply with submission requirements.

1.6.2.1.2. If the Consultant accepts the submission, only one copy bearing the contractors review stamps and the Consultants review stamp will be returned to the Contractor.

1.6.2.1.3. The Contractor will have the returned documents copied in quantity as required, have the copies colour stamped and signed by the Engineer and then return one original signed set of documents plus one copy of that set to the Consultant not later than 7 days after return to the Contractor.

1.6.3. Submit a minimum of one original with colour stamp and signature with additional copies as required with each submission.

1.6.4. The Registered Professional Engineer shall perform sufficient field reviews in order to allow them to provide a letter of professional assurance after completion of the Work, giving assurance that the Work has been installed in general conformance with the sealed shop drawings.

1.7. BID SUBMITTALS

1.7.1. Refer to Section 00 41 00 Bid Form.

1.8. PRODUCT EQUIVALENTS

1.8.1. The Work equipment and materials supplied by the Contractor shall be of materials and equipment herein specified as being:

1.8.1.1. Of specified manufacture; or,

1.8.1.2. A specific equivalent, approved in advance by the Consultant; or,

1.8.1.3. As having been granted an equivalent rating listed as approved by the Consultant in addenda.

1.8.2. Where materials or equipment not specified or approved thus are used by the Contractor, the Contractor uses such at his own risk and may be required by the Consultant to supply materials or equipment as specified or of approved equivalent or replace installed non-approved materials and make good the Work, at no increase to the Contract Price.

1.8.3. Product equivalent requests must be submitted to the Consultant in writing and accompanied by all drawings and data necessary for making a proper evaluation. Product equivalents must be equivalent in quality and appearance, and able to achieve equivalent results. The request shall identify any and all changes required in the work to accommodate the requested substitution.

1.8.4. Product equivalent requests not approved by the Consultant shall not be used in preparing the bid.

1.8.5. Product equivalent approvals will be issued by the Consultant in an addendum. Approvals issued by any other means will not be binding. No substitutions will be considered after the Contract is awarded.

1.8.6. After a submittal has been approved by the Consultant, substitution of materials, equipment and/or procedures shall not be considered unless accompanied by an acceptable explanation for the substitution, and a corresponding written acceptance by the Consultant.

1.9. MATERIAL/PRODUCT SUBSTITUTIONS

1.9.1. Substitutions of other non-specified products shall be considered only when specified products become unavailable due to no fault of the Contractor and if the non-specified product meets or exceeds all criteria of the specified products.

1.9.2. Contractor shall document each request with complete data substantiating compliance of proposed substitution with Contract documents.

1.9.3. Any request for substitution constitutes a representation that Contractor:

1.9.3.1. Has investigated proposed product and determined that it meets or exceeds, in all respects, specified product(s).

1.9.3.2. Shall provide the same warranty for the substitution as for specified product(s).

1.9.3.3. Shall coordinate installation and make other changes which may be required for work to be complete in all respects.

1.9.3.4. Waives claims for additional costs which may subsequently become apparent.

1.9.4. Substitutions shall not be considered when they are indicated or implied on Shop Drawings or Product Data submittals without separate written request, or when acceptance will require substantial revision of Contract Documents.

1.9.5. Consultant shall determine acceptability of proposed substitution and will notify Contractor of acceptance or rejection in writing within a reasonable time.

1.10. PRECONSTRUCTION SUBMITTALS

1.10.1. Provide manufacturer's printed product literature, Technical Data Sheets (TDS), specifications and datasheet and include product characteristics, performance criteria, limitations and colours for all products to be used on this Project.

1.10.2. Provide copies of Workplace Hazardous Materials Information System (WHMIS) – Safety Data Sheets (SDS) as required for all products to be used on this Project.

1.10.3. Refer to the relevant individual specification sections for required submittals.

1.10.4. Material and Product substitutions cannot be completed as part of the preconstruction submittal process.

1.11. PAYMENT PROCEDURES

1.11.1. Refer to Section 00 70 00 Conditions of the Contract.

1.12. CLOSEOUT SUBMITTALS

1.12.1. Refer to Section 01 00 00 General Requirements.

2. PRODUCTS

2.1. Not Used

3. EXECUTION

3.1. Timing

3.1.1. Contractor shall provide preconstruction submittals to the Consultant to review in orderly sequence and within five (5) business days after receipt of signed Contract but prior to start of work.

3.1.2. Consultant shall review and return submittals within five (5) business days following receipt of submittals for review.

3.1.3. Delays caused by tardiness in receipt of submittals shall not be an acceptable basis for extension of the Contract completion date and no claim for extension by reason of such default will be allowed.

3.1.4. Work shall not commence until all required relevant submittals have been reviewed and approved.

3.2. Review

3.2.1. Contractor shall review and thoroughly check all submittals prior to submission to Consultant. This review represents that necessary requirements have been determined and verified, or will be, and that each submittal has been checked and co-ordinated with requirements of the Contract Documents.

3.2.2. The review of submittals by the Consultant is for the purpose of confirming general configuration only. The Contractor shall be solely responsible for actual measurements and dimensions. The Consultant's review of submittals or the revised submittals shall not relieve the Contractor from responsibility for errors and/or omissions which may exist

3.2.3. Consultant will review submittals for conformance with design intent and will return accordingly, in one of the following ways:

3.2.3.1. Reviewed

3.2.3.2. Reviewed as Modified

3.2.3.3. Revise and Resubmit

3.2.3.4. Resubmit Engineering Seal Required

3.2.3.5. Not Reviewed

3.2.4. If upon review by Consultant, no errors or omissions are discovered or if only minor corrections are made, submittals stamped "Reviewed" and Reviewed as Modified" will be returned and fabrication and installation of Work may proceed.

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

3.2.5.1. Contractor shall make all such changes in "Revise and Resubmit" or "Resubmit Engineering Seal Required" submittals and resubmit to Consultant and if necessary, repeat the process until all required changes are made and "Reviewed" is noted on the Shop Drawings.

3.2.5.2. When resubmitting, Contractor shall notify Consultant in writing of revisions other than those requested.

3.2.6. If submittals are rejected, noted copy will be returned and re-submission of corrected shop drawings must be performed before fabrication and installation of Work may proceed.

END OF SECTION

DEMOLITION SECTION 02 41 00

1. GENERAL

1.1. SUMMARY

1.1.1. Includes the demolition, deconstruction, salvage, removal and disposal of select materials.

1.2. RELATED SECTIONS

1.2.1. Section 06 10 00 Rough Carpentry

1.2.2. Section 07 52 00 SBS Modified Bitumen Membrane Roofing

1.2.3. Section 07 62 00 Sheet Metal Flashing and Trim

1.2.4. Section 07 92 00 Joint Sealants

1.3. REGULATORY REQUIREMENTS

1.3.1. Conform to applicable code for demolition work, dust control and electrical work.

1.3.2. Obtain required permits from authorities.

1.3.3. Do not close or obstruct egress width to any building or site exit.

1.3.4. Do not disable or disrupt building fire or life safety systems without prior written approval from the Contract Administrator.

1.3.5. Conform to applicable regulatory procedures when discovering and removing hazardous or contaminated materials.

2. PRODUCTS

2.1. Equipment

2.1.1. Use the tools and equipment necessary to remove the required materials without damaging the facility or materials to remain. Equipment is subject to approval by the Contract Administrator.

3. EXECUTION

3.1. EXAMINATION

3.1.1. Verification of Conditions

3.1.1.1. Inspect the area of work for any unusual or potential hazardous or dangerous materials or conditions. Notify the Contract Administrator in writing of any concerns.

3.1.1.2. Verify the location and quantity of all materials identified to be removed.

3.1.1.3. Check for indication of conduit in or on the metal roof panel, or in other areas of the building that could be affected by the work.

3.1.1.4. Check all metal roof panels from the underside for indications of rust or deterioration.

3.1.1.5. Identify all decommissioned equipment and penetrations. Confirm with the Contract Administrator.

3.1.1.6. Verify that all necessary materials and labour are available and on site to replace the removed materials on the same day.

3.2. PREPARATION

3.2.1. Utilities and Related Equipment

3.2.1.1. Do not interrupt existing utilities serving occupied or used facilities, except when authorized in writing by the Contract Administrator and then only after temporary utility services have been approved and provided.

3.2.2. Relocations

3.2.2.1. Perform the removal and reinstallation of relocated items or items to be reinstalled with workmen skilled in the trades involved. Repair or replace items to be relocated which are damaged by the Contractor with new undamaged items as approved by the Contract Administrator.

3.3. DEMOLITION / REMOVAL

3.3.1. General

3.3.1.1. Do not begin demolition or deconstruction until authorization is received. The Contract Administrator retains the first right of refusal of all demolished or deconstructed materials. The work of this section is to be performed in a manner that maximizes salvage and recycling of materials. Remove rubbish and debris from the project site; do not allow accumulations inside or outside the buildings. The work includes demolition, deconstruction, salvage of identified items and materials, and removal of resulting rubbish and debris. Remove rubbish and debris from site daily unless otherwise directed. Store and secure materials that cannot be removed daily in areas approved by the Contract Administrator.

3.3.1.2. Proceed with demolition only when weather conditions are favorable and no precipitation is imminent. Remove only as much as can be replaced in the same day.

3.3.2. Items to Remain in Place

3.3.2.1. Take necessary precautions to avoid damage to existing items to remain in place, to be reused, or to remain the property of the Contract Administrator. Repair or replace damaged items as approved by the Contract Administrator and to the satisfaction of the Contract Administrator. Coordinate the work of this section with all other work indicated. Construct and maintain shoring, bracing, and supports as required. Do not overload structural elements. Provide new supports and reinforcement for existing construction weakened by demolition, deconstruction, or removal work. Repairs, reinforcement, or structural replacement require approval by the Contract Administrator

prior to performing such work. Cease operations immediately if structure appears to be in danger and notify Contract Administrator. Do not resume operations until directed.

3.3.3. Existing Limits and Protection

3.3.3.1. Do not disturb existing conditions beyond the extent necessary for installation of new construction. Remove debris from work areas daily.

3.3.3.2. Protect the interior of the facility from damage during Work. Erect and maintain temporary partitions, such as sheet plastic, to prevent spread of dust, odours, and noise. Contractor shall be responsible to repair, replace or restore all materials, furnishings or equipment damage from the Work to the satisfaction of the Contract Administrator.

3.3.3.3. Installation of temporary protection must be coordinated with the Contract Administrator, and must not interfere with the normal operations of the facility, unless written permission otherwise is provided by the Contract Administrator.

3.3.3.4. Partial or temporary facility shutdowns must be coordinated with the Contract Administrator. All areas of the facility are to remain accessible and operational during the project, unless written permission otherwise is provided by the Contract Administrator.

3.3.4. Existing Conditions

3.3.4.1. Before beginning any demolition or deconstruction work, survey the site and examine the drawings and specifications to determine the extent of the work. Record existing conditions showing the condition of other facilities and other sections of the facility on which the work is to be performed adjacent to areas of alteration or removal. Photographs will be acceptable as a record of existing conditions. Include in the record the location and extent of existing cracks and other damage and description of surface conditions that exist prior to starting work.

3.3.5. On all Roof Sections:

3.3.5.1. Remove materials in an orderly fashion. Unless otherwise noted, remove all of the existing roof membrane, insulation and vapour barrier down to the metal roof panels and discard. Do not store demolished materials on the roof. Perform any demolition work in accordance with CSA Code of Practice for Safety to CAN3-S350-M80 and all relative Sections of the Manitoba Workplace Safety and Health Act.

3.3.5.1.1. If the existing vapour barrier is applied directly to the metal roof panels, remove those sections that are not adhered or damaged. Sections that are fully adhered and in good condition may remain in place at the Contract Administrator's discretion.

3.3.5.2. Remove and discard all abandoned curbs and penetrations.

3.3.5.3. Remove and discard all metal flashings.

3.3.5.4. Remove and discard all deteriorated or damaged sections of the metal roof panel.

3.3.5.5. Remove and discard all rough carpentry unless otherwise noted.

3.3.5.6. Remove and discard all base flashings.

3.3.5.7. Remove and discard all other existing components identified for removal in the specifications and on the project drawings.

3.3.5.8. Remove and discard all other materials that are not expressly identified but will interfere with the installation of the new materials.

3.3.6. Deteriorated Metal Roof Panel Repair

3.3.6.1. Refer to Detail 1 on Detail Drawing No. A 4.01 Open Deck Infill.

3.3.6.1.1. Where metal roof panel is rusted but remains structurally sound, wire brush metal roof panel units so that all rust is removed. Paint with a metal primer/rust inhibitor and allow to dry before proceeding with the installation of new materials.

3.3.6.1.2. Where metal roof panel is damaged or rusted through in small areas, clean metal roof panel of rust with a wire brush. Paint with a metal primer/rust inhibitor. Install over the damaged area a 20 ga. galvanized steel plate secured to the existing metal roof panel with sheet metal screws around the perimeter of the plate at 6 inches (152 mm] on center. Extend the new steel plate a minimum of 6 inches (152 mm] onto the surface of the existing metal roof panel beyond the damaged area.

3.3.6.1.3. Where metal roof panel is severely damaged or has deteriorated over large areas, remove the entire existing metal roof panel unit and install new metal roof panel of the same type and gauge as the existing. Lap new metal roof panel units over the existing in the same manner as originally installed. Secure to structural framing with appropriate fasteners at 6 inches (152 mm] on center at each available framing member and not more than 36 inches (914 mm] on center at side laps. New metal roof panel unit must span a minimum of 3 structural supports.

3.3.6.1.4. At those locations where side lap screws have not been installed or in those areas where additional side lap screws are required or directed by the Contract Administrator, furnish and install new sheet metal screws at locations and spacing directed by the Contract Administrator.

3.3.6.1.5. At those locations where existing welds have broken from the top of the supporting members or at locations directed by the Contract Administrator, furnish and install new Tek 10 screws to penetrate the metal roof panel and top of the supporting member. Welding is not an acceptable means of attaching/re-attaching the metal roof panel to the supporting member.

3.3.7. Temporary Work

3.3.7.1. Remove all temporary Work, including but not limited to shoring, bracing and partitions that were installed during the execution of the Work, but not part of the permanent Work.

3.3.8. Disposition of Material

3.3.8.1. Title to Materials

3.3.8.1.1. Except for salvaged items specified in related Sections, and for materials or equipment scheduled for salvage, all materials and equipment removed and not reused or salvaged, shall become the property of the Contractor and shall be removed from the site. Title to materials resulting from demolition and deconstruction, and materials and equipment to be removed, is

vested in the Contractor. The Contract Administrator will not be responsible for the condition or loss of, or damage to, such property after contract award. Showing for sale or selling materials and equipment on site is prohibited.

3.3.8.2. Reuse of Materials and Equipment

3.3.8.2.1. Remove and store materials and equipment to be reused or relocated to prevent damage, and reinstall as the work progresses. Store materials to be reused or relocated in a secure area on site. Any damage to the stored materials shall be the responsibility of the Contractor.

3.3.8.3. Salvaged Materials and Equipment

3.3.8.3.1. Salvage items and material to the maximum extent possible. Remove salvaged items to remain the property of the Contract Administrator in a manner to prevent damage. Items to be re-installed shall be installed in the same location they were removed from, unless directed otherwise. Items damaged during removal or storage must be repaired or replaced to match existing items. Deliver the following items reserved as property of the Contract Administrator to the areas designated by the Contract Administrator.

3.3.8.4. Disposal of Removed Materials

3.3.8.4.1. Dispose of unsalvageable and non-recyclable, noncombustible material resulting from removal operations with all applicable federal, provincial and local regulations.

3.3.8.5. Reuse of Salvaged Items

3.3.8.5.1. Recondition salvaged materials and equipment designated for reuse before installation. Replace items damaged during removal and salvage operations or restore them as necessary to usable condition.

END OF SECTION

METAL LADDERS SECTION 05 51 33

1. GENERAL

1.1. SUMMARY

1.1.1. Includes furnishing and installing new metal ladders.

1.2. RELATED SECTIONS

1.2.1. Section 06 10 00 Rough Carpentry

1.2.2. Section 07 62 00 Sheet Metal Flashings and Trim

1.2.3. Section 07 92 00 Joint Sealants

1.3. REFERENCES

1.3.1. ASTM A 36-93a: Standard Specification for Structural Steel

1.4. SUBMITTALS

1.4.1. Shop Drawings

1.4.1.1. Submit to the Contract Administrator the Shop Drawings for the installation of the access ladders and adjacent materials and work.

1.5. DELIVERY, STORAGE, AND HANDLING

1.5.1. Protect from corrosion, deformation, and other types of damage. Store items in an enclosed area free from contact with soil and weather. Remove and replace damaged items with new items.

1.6. FIELD OR SITE CONDITIONS

1.6.1. Existing Conditions

1.6.1.1. Report any unacceptable existing conditions to the Contract Administrator immediately. Do not proceed until unsatisfactory conditions are corrected. Application of new materials shall constitute approval of the existing conditions by the Contractor.

2. PRODUCTS

2.1. MATERIALS

2.1.1. Structural Carbon Steel

2.1.1.1. ASTM A36

2.1.2. Structural Tubing

2.1.2.1. ASTM A500

2.1.3. Steel Pipe

2.1.3.1. ASTM A53, Type E or S, Grade B

2.1.4. Fittings for Steel Pipe

2.1.4.1. Standard malleable iron fittings ASTM A47

2.1.5. Ladders

2.1.5.1. Fabricate vertical ladders using 1-1/4-inch (32 mm) schedule 40 pipe for stringers and rungs. Rungs to be not less than 14 inches wide (356 mm), spaced one foot apart, welded into stringers. Install ladders so that the distance from the rungs to the finished wall surface will not be less than 7 inches (178 mm). Provide heavy clip angles riveted or bolted to the stringer and drilled for not less than two 1/2-inch (13 mm) diameter expansion bolts. Provide intermediate clip angles not over 10 ft. (3 m) on centers.

2.1.5.2. Ladders to be equipped with a lockable ladder cage that prevents access to the ladder by unauthorized individuals.

2.1.5.3. Fabricate ladder cages in accordance with OHS regulations and provided by the ladder manufacturer.

3. EXECUTION

3.1. INSTALLATION / APPLICATION

3.1.1. General Installation Requirements

3.1.1.1. Refer to Drawing No. S 4.01 for Access Ladder Details.

3.1.1.2. Install items at locations indicated, according to manufacturer's instructions. Verify all measurements and take all field measurements necessary before fabrication. Provide exposed fastenings of compatible materials, generally matching in colour and finish, and harmonize with the material to which fastenings are applied. Include materials and parts necessary to complete each item, even though such work is not definitely shown or specified. Thickness of metal and details of assembly and supports must provide strength and stiffness. Formed joints exposed to the weather to exclude water. Items listed below require additional procedures.

3.1.2. Workmanship

3.1.2.1. Metalwork must be well formed to shape and size, with sharp lines and angles and true curves. Drilling and punching must produce clean true lines and surfaces. Continuously weld along the entire area of contact. Do not tack weld exposed connections of work in place. Grind smooth exposed welds. Provide smooth finish on exposed surfaces of work in place, unless otherwise approved. Where tight fits are required, mill joints. Cope or miter corner joints, well formed, and in true alignment. Install in accordance with manufacturer's installation instructions and approved drawings, cuts, and details.

3.1.3. Anchorage, Fastenings and Connections

3.1.3.1. Provide anchorage where necessary for fastening metal items securely in place. Include for anchorage not otherwise specified or indicated slotted inserts, expansion anchors, and powder-actuated fasteners, when approved for concrete; toggle bolts and through bolts for masonry; machine bolts, carriage bolts and powder-actuated threaded studs for steel; through bolts, lag bolts, and screws for wood. Do not use wood plugs in any material. Provide non-ferrous attachments for non-ferrous metal. Make exposed fastenings of compatible materials, generally matching in colour and finish, to which fastenings are applied.

3.1.4. Welding

3.1.4.1. Perform welding, welding inspection, and corrective welding, in accordance with AWS D1.1. Use continuous welds on all exposed connections. Grind visible welds smooth in the finished installation.

3.1.5. Finishes

3.1.5.1. Dissimilar Materials

3.1.5.1.1. Where dissimilar metals are in contact, protect surfaces with a coat conforming to MPI 79 to prevent galvanic or corrosive action. Where aluminum is in contact with concrete, plaster, mortar, masonry, wood, or absorptive materials subject to wetting, protect with ASTM D1187, asphalt-base emulsion.

3.1.6. Field Preparation

3.1.6.1. Remove rust preventive coating just prior to field erection, using a remover approved by the rust preventive manufacturer. Surfaces, when assembled, must be free of rust, grease, dirt and other foreign matter. Apply 2 coats of corrosion inhibitor and primer, and 2 coats of paint to the metal ladders. Colour to be selected by the Contract Administrator.

3.1.7. Ladders

3.1.7.1. Secure to the adjacent construction with the clip angles attached to the stringer. Secure to masonry or concrete with not less than two 1/2-inch (13 mm) diameter expansion bolts. Install intermediate clip angles not over 48 inches (1219 mm) on center. Install brackets as required for securing of ladders welded or bolted to structural steel or built into the masonry or concrete.

END OF SECTION

ROUGH CARPENTRY SECTION 06 10 00

1. GENERAL

1.1. SUMMARY

1.1.1. Installation of new framing, blocking and nailers.

1.2. RELATED SECTIONS

1.2.1. Section 07 52 00 SBS Modified Bituminous Membrane Roofing

1.2.2. Section 07 62 00 Sheet Metal Flashings and Trim

1.2.3. Section 07 92 00 Joint Sealants

1.3. PRICE AND PAYMENT PROCEDURES

1.3.1. Work of this Section is included in the Contract Sum, unless otherwise noted.

1.3.2. Measurement and Payment

1.3.2.1. Work of this section will be measured and paid as a percentage of the total work performed unless otherwise noted.

1.4. REFERENCES

1.4.1. CSA-O80 Series-08 - Wood Preservation.

1.4.2. CSA-O121-08 - Douglas Fir Plywood

1.4.3. CAN/CSA-O141-05 (R2009) - Softwood Lumber.

1.4.4. CSA-O151-09 - Canadian Softwood Plywood.

1.4.5. CSA-O153-M1980 (R2008) - Poplar Plywood.

1.4.6. CSA-O437-93 (R2006) - OSB and Waferboard.

1.4.7. NPA A208.1-2009 - Particleboard.

1.4.8. APA (American Plywood Association) - Grades and Specifications.

1.4.9. CANPLY (Canadian Plywood Association) - Canadian Plywood Handbook.

1.4.10. National Lumber Grades Authority (NLGA) - Standard Grading Rules for Canadian Lumber, 2007 Edition.

1.4.11. CAN/ULC-S702 - Thermal Insulation, Mineral Fibre, for Buildings.

1.5. WARRANTY

1.5.1. Installer's Warranty

1.5.1.1. Include all work performed under this section in the warranty in D.22.

2. PRODUCTS

2.1. LUMBER

2.1.1. Dimensional Lumber

2.1.1.1. NLGA Standard Grading Rules for Canadian Lumber; CAN/CSA-O141. 14% maximum moisture content. SPF structural grade.

2.1.2. Plywood:

2.1.2.1. Douglas Fir. Minimum thickness of 1/2 inch (13 mm), unless otherwise noted.

2.2. ACCESSORIES

2.2.1. General

2.2.1.1. Unless otherwise indicated or specified, rough hardware, clips and fasteners shall be stainless steel or galvanized, and of the type and size necessary for the project requirements. Sizes, types, and spacing of fastenings of manufactured building materials shall be as recommended by the product manufacturer unless otherwise indicated or specified. Rough hardware, clips and fasteners in contact with or fastened into pressure treated wood must be stainless steel, or approved for installation in pressure treated wood. All galvanized metal shall be ACQ approved.

2.2.2. Cavity Insulation

2.2.2.1. CAN/ULC-S702; ASTM C665, or mineral wool fibre, in batt form; friction fit, with thermal resistance: R-25 (RSI-4.4), min.

2.2.2.1.1. Comfort Batt by Roxul

2.2.2.1.2. Or approved equivalent in accordance with B.7.

2.2.3. Nails

2.2.3.1. ASTM F 547, size and type best suited for purpose. For sheathing, length of nails shall be sufficient to extend 1 inch (25 mm) into supports. For fastening framing members to each other, length of nail shall be sufficient to extend 1-1/2 inches (38 mm) into the base member. Nailing shall be in accordance with the recommended nailing schedule contained in AF&PA T101. Where detailed nailing requirements are not specified, nail size and spacing shall be sufficient to develop an adequate strength for the connection. The connection's strength shall be verified against the nail capacity tables in AF&PA T101. Reasonable judgment backed by experience shall ensure that the designed connection will not cause the wood to split. If a load situation exceeds a reasonable limit for nails, a specialized connector shall be used.

2.2.4. Wood Screws

2.2.4.1. For sheathing, length of screw shall be sufficient to extend 1 inch (25 mm) into supports. For fastening framing members to each other, length of screw shall be sufficient to extend 1-1/2 inches

(38 mm) into the base member. Where detailed fastening requirements are not specified, size and spacing shall be sufficient to develop an adequate strength for the connection. Reasonable judgment backed by experience shall ensure that the designed connection will not cause the wood to split.

2.2.5. Other Fasteners

2.2.5.1. Provide other fasteners as required to secure the new framing to the deck, walls and other substrates. Fasteners shall be suitable for their use and approved for their use by the manufacturer. Install these fasteners in accordance with the manufacturer's instructions.

3. EXECUTION

3.1. EXAMINATION

3.1.1. Verification of Conditions

3.1.1.1. Inspect the substrate. Verify the substrate is ready to receive new framing.

3.1.2. Evaluation and Assessment

3.1.2.1. Ensure the compatibility of the proposed fasteners to the deck. Ensure that the proposed fasteners will secure the new rough carpentry to the deck without causing damage to the deck or the framing. Perform tests as required. In the event the proposed fasteners are incompatible with the deck, will not properly secure the rough carpentry or will cause non-incident damage to the deck, do not install additional fasteners and notify the Contract Administrator.

3.2. INSTALLATION / APPLICATION

3.2.1. General

3.2.1.1. Existing rough carpentry may be left in place without modification if in good condition, of adequate dimensions, without rot, properly secured to the deck, and can be incorporated into the finished roof system without compromising the overall integrity of the new roof system.

3.2.1.2. New rough carpentry assemblies shall be rigid, shall not deflect or deform when placed under the service loads and shall be properly secured to the deck, wall or other substrate and other framing members. When complete, rough carpentry assemblies shall function as a unit, receive other applicable building materials as designed and be incorporated into the overall roof system without compromising the overall roof system.

3.2.1.3. All new curbs, equipment supports, parapets and other vertical rough carpentry transitions or penetrations through the roof system shall be a minimum of 8 inches (203 mm) above the finished roof level unless otherwise noted.

3.2.1.4. Nailers/Blocking

3.2.1.4.1. Furnish and install new lumber where required by the project documents. Install nailers/blocking by stacking dimensional lumber and plywood to achieve the required height. Stack the lumber so that the shortest dimension (thickness) is vertical unless otherwise noted.

3.2.1.4.2. Secure the first layer to the deck with appropriate fasteners 6 inches (152 mm) on center maximum staggered unless otherwise noted through the vapour barrier support panel. Set the first layer in a bed of compatible cement or sealant.

3.2.1.4.3. Secure subsequent layers of lumber to the layer below with wood screws 12 inches (305 mm) on center staggered maximum unless otherwise noted, or with nails 6 inches (152 mm) on center staggered maximum unless otherwise noted. Fastener must penetrate the layer below 1 inch (25 mm) minimum.

3.2.1.4.4. Stagger the butt joints in the lumber from the preceding layer 12 inches (305 mm) min. Install a fastener through the lumber on both sides of the joint.

3.2.1.5. Walls

3.2.1.5.1. Furnish and install new walls where required by the project documents. Frame new walls with 6 inch (140 mm) wide nominal lumber unless otherwise noted. Select studs for straightness and set plumb, true, and in alignment. Secure the studs to the top and bottom plate with 2 framing nails each. Secure the bottom plate to the deck with appropriate fasteners 6 inches (152 mm) on center maximum unless otherwise noted through the vapour barrier support panel. Set the bottom plate in a continuous bed of compatible cement or sealant.

3.2.1.5.2. Install mineral wool batt insulation between the studs, completely filling the space. Install 1/2-inch (13 mm) plywood on both sides of the wall. Secure the plywood to the studs and plates with framing nails 12 inches (305 mm) on center maximum around the perimeter and 16 inches (406 mm) on center in each direction maximum in the field. Walls over 16 inches (406 mm) in height shall have a row of fasteners at mid-height 16 inches (406 mm) on center. Stagger the joints in the top plate, the bottom plate and the plywood 12 inches (305 mm) minimum. Joints must not align or form a hinge in the wall. Joints must occur at a stud. Slope the top of the walls to the interior of the roof. Walls must be true and level.

3.2.1.5.3. Walls that are prefabricated and on site, or installed on the roof must be protected and covered. Walls that are wet or otherwise damaged shall be marked, removed and replaced.

3.2.1.5.4. Non-Load Bearing Walls

3.2.1.5.4.1. Frame walls with a single bottom plate and a single top plate. Butt joints in the single top plate shall occur at a double stud pack. Space studs 16 inches (406 mm) on center maximum unless otherwise noted.

3.2.1.5.5. Load Bearing Walls

3.2.1.5.5.1. Frame walls with a single bottom plate and a double top plate. Stagger butt joints in the top plate 12 inches (305 mm) minimum. Space studs 12 inches (305 mm) maximum unless otherwise noted. A wall shall be considered load bearing when the load exceeds 50 lbs. (23 kg) unless otherwise noted.

3.2.2. Plywood Support Panel

3.2.2.1. Install plywood directly on existing metal roof panels. The edge of the plywood must be fully supported by the structural metal panel ribs. Plywood to be Tongue and Groove. Minimum thickness of 3/4 inch (19 mm), unless otherwise noted.

3.2.2.2. Cut panels as required so edges rest on center of each truss. Cut straight lines with adequate tools.

3.2.2.3. Where slopes change, boards will be cleanly cut to acquire deck shape. Place boards perpendicular to structural metal panel ribs for continuous support at extremities.

3.2.2.4. Board joints will be staggered and perfectly butted.

3.2.2.4.1. Refer to Detail 1 on Drawing No. A 4.02 for plywood panel staggering requirements.

3.2.2.5. Mechanically Attached Installation

3.2.2.5.1. Refer to Detail 1 on Drawing No. A 4.02 for the Mechanically Attached Installation Details.

3.2.2.5.2. Secure the panel to the underlying material using plates and fasteners approved by the roof system manufacturer. Engage fasteners by driving them through the underlying material into the top flange of the metal roof panel. Drive fasteners so they penetrate 1 inch (25 mm) min through the top rib of the metal roof panel, but do not extend below the bottom flute of the metal roof panel.

3.2.3. Z-Bar Supports

3.2.3.1. Furnish and install new 18 gauge Z-bar supports to support the new plywood deck. Z-bar supports are to be installed from eave to ridge at 24 inches (610 mm) on centre. Fasten the Z-bars to the existing purlins using fasteners approved for the material they will penetrate.

3.2.3.2. Furnish and install mineral wool batt insulation around the perimeter for a minimum of 24 inches (610 mm) from the roof edge.

3.2.1. Vapour Barrier Support Panel

3.2.1.1. Below all new curbs, parapets, area dividers and other vertical framed structures, install a continuous strip of plywood directly on the deck equal in thickness to the vapour barrier support panel. Width of plywood should be sufficient to extend onto the roof deck on either side of the framing 4 inches (102 mm) min. On steel decks, the edge of the plywood must be fully supported by the top rib.

3.2.2. Area Dividers

3.2.2.1. Modify the existing walls to divide roof areas where required by the project documents.

3.2.3. Equipment Support Curbs

3.2.3.1. Furnish and install new 4-walled curbs where required by the project documents. Curb walls may be framed with 4 inch (89 mm) wide nominal lumber on curbs 2 foot by 2 foot (610 mm by 610 mm) or less, or where a 6 inch (140 mm) wide nominal curb would interfere with the ducting or other penetration through the roof. Interior of the curb must be fully insulated.

3.2.4. Flat Top Curbs

3.2.4.1. Curbs 2 foot by 2 foot (610 mm by 610 mm) and under:

3.2.4.1.1. Furnish and install new 4-walled curbs where required by the project documents. Frame with 4 inch (89 mm) wide nominal lumber. Fully insulate the interior and install new plywood over the top of the curb.

3.2.4.2. Curbs over 2 foot by 2 foot (610 mm by 610 mm):

3.2.4.2.1. Furnish and install new 4-walled curbs where required by the project documents. Frame with 6 inch (140 mm) wide nominal lumber. Fully insulate the interior and install new 2 inch by 6 inch nominal joists (38 mm by 140 mm) 24 inches (610 mm) on center and plywood over the top of the curb.

3.3. SITE QUALITY CONTROL

3.3.1. Non-Conforming Work

3.3.1.1. Non-conforming Work must be removed and new materials installed in accordance with these specifications.

3.4. PROTECTION

3.4.1. Protect new and existing rough carpentry from damage from reroofing operations.

3.4.2. Protect new and existing rough carpentry from fire.

3.5. SCHEDULE

| Feature | Roof Section 1 | Roof Section 2 |
|------------------------------|-------------------------|-------------------------|
| Plywood Support Panel | New | New |
| Z-Bar Supports | New | New |
| Vapour Barrier Support Panel | New | New |
| Perimeter nailer | Existing to remain | Existing to remain |
| Area Divider | Existing to be modified | Existing to be modified |
| Curbs | New | New |

END OF SECTION

SBS MODIFIED BITUMINOUS MEMBRANE ROOFING SECTION 07 52 00

1. GENERAL

1.1. SUMMARY

1.1.1. This section specifies the supply and installation of the components required for a two ply SBS Roofing System.

1.1.2. Minimum two ply SBS modified bitumen roof system consisting of vapour barrier support panels, vapour barrier, insulation, cover boards, and modified bitumen base sheet and cap sheet.

1.2. RELATED SECTIONS

1.2.1. Section 06 10 00 Rough Carpentry

1.2.2. Section 07 62 00 Sheet Metal Flashing and Trim

1.2.3. Section 07 92 00 Joint Sealants

1.3. REFERENCES

1.3.1. All References shall be the current edition.

1.3.2. ASTM C578 - Rigid, Cellular Polystyrene Thermal Insulation.

1.3.3. ASTM C1289 - Faced Rigid Cellular Polyisocyanurate Thermal Insulation Board.

1.3.4. ASTM D6162 - Styrene Butadiene Styrene (SBS) Modified Bituminous Sheet Materials Using a Combination of Polyester and Glass Fiber Reinforcements.

1.3.5. ASTM D6163 - Styrene Butadiene Styrene (SBS) Modified Bituminous Sheet Materials Using Glass Fiber Reinforcements

1.3.6. ASTM D6164 - Styrene Butadiene Styrene (SBS) Modified Bituminous Sheet Materials Using Polyester Reinforcements

1.3.7. CAN/CGSB-37.56-M - Membrane Modified, Bituminous, Prefabricated, and Reinforced for Roofing.

1.3.8. CAN/CSA-A123.4-04 - Asphalt for Constructing Built-Up Roof Coverings and Waterproofing Systems.

1.3.9. CAN/ULC-S701 - Thermal Insulation, Polystyrene, Boards and Pipe Covering.

1.3.10. CAN/ULC-S702 - Thermal Insulation, Mineral Fibre, for Buildings.

1.3.11. CAN/ULC-S704 - Thermal Insulation, Polyurethane and Polyisocyanurate Boards, Faced.

1.3.12. ULC (Underwriters Laboratories of Canada) - List of Equipment and Materials for:

1.3.12.1. Building Materials.

1.3.12.2. Fire Resistance.

1.4. SUBMITTALS

1.4.1. Manufacturer Reports

1.4.1.1. Submit the manufacturer's field reports, including the date and time of the visit, observations, statement of acceptance or non-acceptance of the work, and any supplemental instructions provided to the installers.

1.5. DELIVERY, STORAGE, AND HANDLING

1.5.1. Delivery and Acceptance Requirements

1.5.1.1. Deliver materials in sufficient quantity to allow continuity of the work. Deliver materials to site in manufacturer's unopened and undamaged standard commercial containers bearing the following legible information:

1.5.1.1.1. Name of manufacturer

1.5.1.1.2. Type

1.5.1.1.3. Brand designation

1.5.1.2. Mark and remove wet or damaged materials from the site. Deliver materials in sufficient quantity to allow work to proceed without interruption.

1.5.2. Storage and Handling Requirements

1.5.2.1. Protect materials against moisture absorption and contamination or other damage.

1.5.2.2. Completely cover materials stored outdoors, on and off roof, with waterproof canvas protective covering. Do not use polyethylene sheet as a covering. Tie covering securely to pallets to make completely weatherproof. Provide sufficient ventilation to prevent condensation. Distribute materials temporarily stored on roof to stay within live load limits of the roof construction. Maintain a minimum distance of 35 feet (11 meters) for all stored flammable materials, including materials covered with shrink wraps, craft paper and/or tarps from all torch/welding applications. Immediately remove wet, contaminated or otherwise damaged or unsuitable materials from the site. Damaged materials may be marked by the Contract Administrator.

1.5.2.3. Avoid crushing or crinkling of roll materials. Store roll materials on end on clean raised platforms or pallets one level high in dry locations with adequate ventilation, such as an enclosed building or closed trailer. Do not store roll materials in buildings under construction until concrete, mortar, and plaster work is finished and dry. Do not store materials outdoors unprotected. Prevent damage to edges and ends of roll materials. Do not install damaged materials in the work. Select and operate material handling equipment to prevent damage to materials or applied roofing.

1.5.2.4. Store adhesives and solvent-based mastics at a minimum of 10 °C (50°F), unless more stringent requirements are provided by the manufacturer.

1.6. FIELD OR SITE CONDITIONS

1.6.1. Ambient Conditions

1.6.1.1. Do not install roofing system during any form of precipitation, including fog, or when there is ice, frost, moisture, or any other visible dampness on the roof deck. Follow manufacturer's printed instructions for Cold Weather Installation. Materials installed during adverse weather conditions shall be subject to removal and replacement with new materials at no additional cost to Contract Administrator.

1.6.2. Existing Conditions

1.6.2.1. Report any unacceptable existing conditions to the Contract Administrator immediately. Do not proceed until unsatisfactory conditions are corrected. Application of new materials shall constitute approval of the existing conditions by the Contractor.

1.7. SAFETY

1.7.1. The Contractor is solely responsible all means and methods as they relate to the project safety shall comply with all applicable local, provincial and federal requirements that are safety related.

1.7.2. Prior to the start of work, conduct a site assessment to ensure its safety in order to minimize fire risks and hazards.

1.7.3. Property Protection

1.7.3.1. Take all precautions necessary to prevent ignition of combustible materials during application of roofing. Immediately call the fire department if a fire commences. Review all fire safety procedures as outlined at the pre-construction conference. Install materials using the techniques recommended by the manufacturer. Do not store flammable liquids on the roof.

1.7.3.2. Provide a minimum of one multipurpose ABC portable fire extinguisher within 20 feet (6 meters) of each torch in use, or on the roof being covered or repaired.

1.7.3.3. Check all fire extinguishers prior to commencement of work, and upon completion of the day's work, to ensure fullness and operability.

1.7.3.4. Seal off voids or openings in the substrate with non-combustible materials prior to installing torch-applied materials in the area. When working around intakes and openings, temporarily disconnect and block to prevent flame of torch from being drawn into the opening. Provide non-combustible shielding or flame guard protection where gaps or voids occur in the construction in area of torch work.

1.7.3.5. Do not torch in areas of poor and/or no visibility (curbs, corners, eaves, expansions joints, flashing, other voids and small penetrations) which could allow a torch flame to ignite combustible material(s) hidden from view or within the underside of the roof deck or building interior.

1.7.4. Fire Watch

1.7.4.1. All personnel on the roof during torch application must be properly trained to use a fire extinguisher. Provide a fire watch for a minimum of two hours after completion of all hot work at the end of each work shift. Maintain the fire watch for additional time required to ensure no potential ignition conditions exist.

1.7.4.2. Utilize heat sensing meters to scan for hot spots in the work. Fire watch to be conducted by personnel properly trained to survey the underside of the roof deck (where possible) and the topside of possible smoldering elements. Do not leave the rooftop unattended during breaks in work during a work shift. Walk and scan all areas of application checking for hot spots, fumes, or smoldering, especially at wall and curb areas, prior to departure at the end of each work shift. Ensure any and all suspect conditions are eliminated prior to leaving the site each work shift.

1.7.5. Open Flame Application (Torch) Equipment and Personnel Safety

1.7.5.1. Only trained and qualified roofing applicators are allowed to operate any torching equipment.

1.8. WARRANTY

1.8.1. Manufacturer Warranty

1.8.1.1. Provide the Manufacturer's 15 year no dollar limit full roof system, materials and installation, workmanship warranty, including flashing, insulation and accessories necessary for a watertight roof system construction. Provide warranty directly to the Contract Administrator and commence warranty effective date at time of Contract Administrator's acceptance of the roof work.

1.8.2. Installer Warranty

1.8.2.1. Warranty shall be for a period of two years that the roof system, as installed, is free from defects in installation workmanship, to include the roof membrane, flashing, insulation, accessories, attachments, and sheet metal installation integral to a complete watertight roof system assembly. The roof system installer is responsible for correction of defective workmanship and replacement of damaged or affected materials. The roof system installer is responsible for all costs associated with the repair or replacement work.

1.9. CONFORMANCE AND COMPATIBILITY

1.9.1. The entire roofing and flashing system must be in accordance with specified and indicated requirements, including fire and wind resistance requirements. Work not specifically addressed and any deviation from specified requirements must be in general accordance with recommendations of the CRCA guidelines, membrane manufacturer published recommendations and details, and compatible with surrounding components and construction. Submit any deviation from specified or indicated requirements to the Contract Administrator for approval prior to installation.

1.9.2. All waterproofing materials will be provided by the same manufacturer.

2. PRODUCTS

2.1. MANUFACTURERS

2.1.1. All specifications and details are based on a complete system including warranties as manufactured by manufacturers listed

2.1.1.1. Soprema

2.1.1.2. IKO

2.2. MATERIALS

2.2.1. Primer

2.2.1.1. For Heat Welded Membranes:

2.2.1.1.1. A blend of bitumen, volatile solvents and adhesive enhancing additives. Used as a primer to enhance the adhesion of torch-applied waterproofing membranes.

2.2.1.1.1.1. Elastocol 500 by Soprema

2.2.1.1.1.2. Mod-Bit Primer by IKO

2.2.1.1.1.3. Or approved equivalent.

2.2.2. Fire Protection Tape

2.2.2.1. Self-adhesive membrane composed of a reinforced glass mat and SBS modified bitumen designed to prevent flames from penetrating into empty spaces and openings while installing heat-welded membranes.

2.2.2.1.1. Fireguard Tape by Soprema

2.2.2.1.2. Modiflex Tape by IKO

2.2.2.1.3. Or approved equivalent

2.2.3. Insulation Fasteners

2.2.3.1.1. Fasteners shall conform to manufacturer's recommendations. Flush-driven through flat round or hexagonal steel plates. Steel plates shall be zinc-coated, flat round not less than 3-inch (76 mm) diameter or hexagonal not less than 28 gauge. Fastener head shall recess fully into the plate after it is driven. Plates shall be formed to prevent dishing. Do not use bell-or cup-shaped plates. Fasteners shall be spaced to withstand an uplift pressure as required by the National Building Code and CSA standards.

2.2.4. Membrane Fasteners and Plates

2.2.4.1. Provide coated, corrosion-resistant fasteners as recommended by the modified bitumen sheet manufacturer's printed instructions and meeting the requirements of CSA and the wind uplift resistance specified. For fastening of membrane or felts to wood materials, provide fasteners driven through 1 inch (25 mm) diameter metal discs, or one piece composite fasteners with heads not less than 1 inch (25 mm) in diameter or 1 inch (25 mm) square with rounded or 45 degree tapered corners.

2.2.4.2. Metal Plates

2.2.4.2.1. Provide flat corrosion-resistant round stress plates as recommended by the modified bitumen sheet manufacturer's printed instructions; not less than 2 inch (51 mm) in diameter. Form discs to prevent dishing or cupping.

2.2.5. Vapour Barrier Support Panel

2.2.5.1. Gypsum Roof Board

2.2.5.1.1. ASTM C 1177 or ASTM C1278, 5 Flame Spread and 0 Smoke developed when tested in accordance with ASTM E 84, 500 psi (3447 kPa), Class A, non-combustible, and coated with a non-asphaltic coating. Max 4 by 8 feet (1.2 m by 2.4 m) board size.

2.2.5.1.1.1. DensDeck Prime Roof Board by Georgia Pacific

2.2.5.1.1.2. Securock Gypsum Fiber Roof Board by US Gypsum

2.2.5.1.1.3. or approved equivalent

2.2.6. Vapour Barrier

2.2.6.1. Self-Adhering SBS membrane Vapour Barrier

2.2.6.1.1. CAN/CGSB-37.56-M; SBS modified bitumen membrane with a high strength glass mat reinforcement; Minimum thickness 90 mils (2.2 mm) with a release film on the adhesive side. Top surface must be sanded if adhesive is to be applied.

2.2.6.1.1.1. Sopraseal Stick 130 by Soprema

2.2.6.1.1.2. Armourbond Flash Sand by IKO

2.2.6.1.1.3. Or approved equivalent in accordance with B.7.

2.2.6.1.2. Self-sealing modified bitumen membrane with a laminated woven polyethylene film facer. Min thickness 40 mils (1.0 mm) with a release film on the adhesive side.

2.2.6.1.2.1. Sopraseal Stick 1100 T by Soprema

2.2.6.1.2.2. Aquabarrier AVB by IKO

2.2.6.1.2.3. Or approved equivalent in accordance with B.7.

2.2.7. Insulation

2.2.7.1. Roof insulation shall be one or an assembly of the following materials and compatible with attachment methods for the specified insulation and roof membrane:

2.2.7.1.1. Fiberglass Faced Polyisocyanurate Board

2.2.7.1.1.1. CAN/ULC-S704 Type II; ASTM C 1289 Type II, Class 2, Grade 2 glass mat membrane both sides. Minimum compressive strength shall be 20 pounds per square inch (psi) (138 kPa); Min 1 inch (25 mm) thickness; Min R-5.60 (per inch (RSI-0.99 per 25 mm).

2.2.7.1.1.1.1. Sopra-Iso Plus by Soprema

2.2.7.1.1.1.2. IKOtherm III by IKO

2.2.7.1.1.1.3. H-Shield CG by Hunter

2.2.7.1.1.1.4. Or approved equivalent in accordance with B.7.

2.2.8. Roof Cover Board

2.2.8.1. Factory Laminated Cover Board/Membrane Composite Panels

2.2.8.1.1. Bituminous Core Board/Base Sheet Composite Panels

2.2.8.1.1.1. Polyester reinforced SBS modified base sheet membrane with selvedge technology factory-laminated on a semi-rigid asphaltic board. The top surface is covered with thermofusible plastic film.

2.2.8.1.1.2. CGSB 37-56-M; the SBS base sheet membrane must meet the same requirements of the base sheet membrane listed in this section.

2.2.8.1.1.3. Bituminous Core Board

2.2.8.1.1.3.1. CAN/ULC S702; Semi-rigid roofing support panel composed of a mineral-reinforced asphaltic core between two asphalt-saturated fiberglass liners; Min 3/16-inch (5 mm) thickness.

2.2.8.1.1.3.1.1. Soprasmart Board 180 by Soprema

2.2.8.1.1.3.1.2. Protectobase 180 by IKO

2.2.8.1.1.3.1.3. Or approved equivalent

2.2.9. Parapet and Curb Cover Board

2.2.9.1. Bituminous Core Board

2.2.9.1.1. CAN/ULC S702; Semi-rigid roofing support panel composed of a mineral-reinforced asphaltic core between two asphalt-saturated fiberglass liners. Minimum thickness of the core board to be 1/8 inch (3 mm).

2.2.9.1.1.1. SopraBoard by Soprema

2.2.9.1.1.2. ProtectoBoard by IKO

2.2.9.1.1.3. Or approved equivalent in accordance with B.7.

2.2.10. Roofing Membranes

2.2.10.1. Modified Bitumen Field Sheets

2.2.10.1.1. Furnish a combination of specified materials that comprise the modified bitumen manufacturer's standard system of the number and type of plies specified. Materials provided must be suitable for the service and climatic conditions of the installation. Modified bitumen sheets must be watertight and visually free of pinholes, particles of foreign matter, non-dispersed raw material, factory splices, or other conditions that might affect serviceability. Polymer modifier must be uniformly dispersed throughout the sheet. Edges of sheet must be straight and flat.

2.2.10.2. Torch Applied Membrane:

2.2.10.2.1. SBS Base Sheet: CAN/CGSB-37.56-M, 9th draft; ASTM D6164, Type I, Grade S, minimum 90 mils thick (2.2 mm). Membrane must have a burn off film on both sides.

2.2.10.2.1.1. Sopralene Flam 180 by Soprema

2.2.10.2.1.2. Torchflex TP-180-FF by IKO

2.2.10.2.1.3. Or approved equivalent in accordance with B.7.

2.2.10.2.2. SBS Cap Sheet: CAN/CGSB-37.56-M, 9th draft; ASTM D6164, Type II, Grade G, minimum 150 mils thick (3.8 mm). The underside of the membrane must have a burn off film.

2.2.10.2.2.1. Sopralene Flam 250 GR by Soprema

2.2.10.2.2.2. Torchflex TP-250- Cap by IKO

2.2.10.2.2.3. Or approved equivalent in accordance with B.7.

2.2.10.3. Flashing Membrane

2.2.10.3.1. Membrane manufacturer's standard, minimum two-ply modified bitumen membrane flashing system compatible with the roof membrane specified and as recommended in membrane manufacturer's published literature. Flashing membranes must meet or exceed the properties of the material standards specified for the modified bitumen base and cap sheet, except that flashing membrane thickness must be as recommended by the membrane manufacturer.

2.2.10.4. End Lap Cover Strip

2.2.10.4.1. Membrane strip made of SBS modified bitumen and composite reinforcement. Both faces are covered with a plastic thermofusible film. The strip to be torch applied over aligned end laps to ensure water-tightness.

2.2.10.4.1.1. Sopralap by Soprema

2.2.10.4.1.2. Torch Tape by IKO

2.2.10.4.1.3. Or approved equivalent in accordance with B.7.

2.2.11. Modified Bitumen Roof Cement

2.2.11.1. ASTM D4586, Type II for vertical surfaces, Type I for horizontal surfaces, compatible with the modified bitumen roof membrane.

2.2.11.1.1. Sopramastic and Sopramastic ALU by Soprema

2.2.11.1.2. AquaBarrier Mastic by IKO

2.2.11.1.3. Or approved equivalent in accordance with B.7.

2.2.12. Liquid Flashing

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

2.2.12.1.1. Alsan Flashing and Flashing Reinforcement by Soprema

2.2.12.1.2. IKO MS Detail and Reinforcement by IKO

2.2.12.1.3. Or approved equivalent in accordance with B.7.

2.2.13. Pitch Pocket Filler

2.2.13.1. Polyester pre-fabricated pitch pocket system, in various size, with compounds that bond together, with solvent less mastic and with one component elastomeric sealant.

2.2.13.1.1. Sopramastic Block System by Soprema.

2.2.13.1.2. Or approved equivalent in accordance with B.7.

2.2.14. Pre-manufactured Accessories

2.2.14.1. Pre-manufactured accessories must be manufacturer's standard for intended purpose, comply with applicable specification section, compatible with the membrane roof system and approved for use by the modified bitumen membrane manufacturer.

2.2.15. Prefabricated Pipe Flashings

2.2.15.1. A metal flashing sleeve with integrated flange, premolded urethane insulation liner, EPDM triple pressure grommet seal and EPDM base seal. Flange must extend onto the deck 4 inches min, and the top of the sleeve to be 7 inches (178 mm) min above the finished roof.

2.2.16. Prefabricated Plumbing Vent Flashings

2.2.16.1. A metal flashing sleeve with integrated flange, premolded urethane insulation liner, metal cap flashing and EPDM base seal. Flange must extend onto the deck 4 inches (102 mm) min, and the top of the sleeve to be min 18 inches (457 mm) above the finished roof.

2.2.16.1.1. SJ-27 Removable Cap Stack Jack Flashings by Thaler Metal Industries

2.2.16.1.2. Or approved equivalent in accordance with B.7.

2.2.17. Prefabricated Curbs

2.2.17.1. Provide 18 gauge G90 galvanized curbs with minimum 4-inch (102 mm) flange for attachment to roof nailers. Curbs must be minimum height of 10 inch (254 mm) above the finished roof membrane surface.

3. EXECUTION

3.1. EXAMINATION

3.1.1. The Contractor shall inspect and approve the deck condition (deteriorated deck, repairs as required etc.), as well as drains, curbs, control joints, expansion joints, perimeter walls, roof penetrating

components, and equipment supports are in place and all adjustments and modifications to these elements are performed as required. Commencement of work shall imply acceptance of the surfaces and conditions.

3.1.2. Ensure that the following conditions exist prior to application of the roofing materials:

3.1.2.1. Surfaces are rigid, clean, dry, smooth, and free from cracks, holes, and sharp changes in elevation. Joints in the substrate are sealed to prevent dripping of bitumen into building or down exterior walls.

3.1.2.2. Wood nailers are in place on non-nailable surfaces, to permit nailing of base flashing at minimum height of 8 inch (203 mm) above finished roofing surface.

3.1.2.3. Protect all combustible materials and surfaces which may contain concealed combustible or flammable materials.

3.1.2.4. Wood nailers are fastened in place at eaves, gable ends, openings, and intersections with vertical surfaces for securing of membrane, edging strips, attachment flanges of sheet metal, and roof fixtures. Embedded nailers are flush with deck surfaces. Surface-applied nailers are the same thickness as the roof insulation.

3.2. PREPARATION

3.2.1. Equipment

3.2.1.1. Maintain all equipment and tools in good working order.

3.2.1.2. Use torch types recommended by the membrane manufacturer.

3.2.2. Surface Preparation

3.2.2.1. Apply membrane to clean, dry surfaces only. Do not apply membrane to surfaces that have been wet by rain or frozen precipitation within the previous 12 hours. Provide cleaning and artificial drying with heated blowers or torches as necessary to ensure clean, dry surface prior to membrane application.

3.3. PROTECTION

3.3.1. Provide temporary watertight cutoffs at the end of each work day or whenever precipitation is imminent. Fill all profile voids in cut-offs to prevent entrapping of moisture into the area below the membrane. Seal off flutes in metal decking along the cutoff edge. Cutoffs shall be removed when work is resumed.

3.3.2. Provide temporary flashing at drains, curbs, walls and other penetrations and terminations of roofing sheets until permanent flashings can be applied. Remove temporary flashing before applying permanent flashing. Ensure that the roof will not hold water. Install temporary drainage measures as required.

3.3.3. Do not permit storing, walking, wheeling, and trucking directly on applied roofing materials. Provide temporary walkways, runways, and platforms of smooth clean boards, mats or planks as necessary to avoid damage to applied roofing materials, and to distribute weight to conform to live load limits of roof construction. Use rubber-tired equipment for roofing work.

3.4. INSTALLATION / APPLICATION

3.4.1. General

3.4.1.1. Apply roofing materials as specified herein and in accordance with manufacturer's recommendations. Keep roofing materials dry before and during application. Complete application of roofing in a continuous operation. Begin work at the drainage point on the roof, either the eaves or the drains. As much as is possible, apply the entire roll in a continuous manner. Do not permit foot or equipment traffic on newly installed membrane.

3.4.1.2. Furnish and install new prefabricated and sheet metal flashings as indicated or required to ensure a water tight system.

3.4.1.3. Ensure proper sheet alignment prior to installation. Apply membrane layers perpendicular to slope of roof in shingle fashion to shed water, including application on areas of tapered insulation that change slope direction. Bucking or backwater laps are prohibited. Fully adhere membrane sheets to underlying substrate materials. Provide minimum 3-inch (76 mm) side laps and minimum 6-inch (152 mm) end laps or as more stringently required by membrane manufacturer. Stagger end laps minimum 24 inch (610 mm). Offset side laps between membrane layers a minimum of 12 inch (305 mm). Offset end laps between membrane layers a minimum of 24 inch (610 mm).

3.4.1.4. Provide tight smooth laminations of each membrane layer. Ensure full membrane adhesion and full lap seals. Rework to seal any open laps prior to application of subsequent membrane layers. The completed membrane application must be free of surface abrasions, air pockets, blisters, ridges, wrinkles, buckles, kinks, fishmouths, voids, or open seams.

3.4.1.5. Ensure waterproofing conditions for roofs at all times, including protection during installation work by other trades and progressive protection as work is completed (e.g. vents, drains, etc.).

3.4.2. Mechanically Fastened Installation

3.4.2.1. Mechanical Fasteners on Steel Deck

3.4.2.1.1. Secure the panel to the underlying material using plates and fasteners approved by the roof system manufacturer. Engage fasteners by driving them through the underlying material into the top flange of the steel deck. Drive fasteners so they penetrate 1 inch (25 mm) min through the top rib of the steel deck, but do not extend below the bottom flute of the steel deck.

3.4.2.2. Mechanical Fasteners on Wood Deck

3.4.2.2.1. Secure the insulation board to the underlying material using plates and fasteners approved by the roof system manufacturer. Engage fasteners by driving them through the underlying material into the wood deck. Drive fasteners so they penetrate 3/4-inch (19 mm) min into the deck. Ensure fasteners do not penetrate through the roof deck into the interior of the facility.

3.4.3. Vapour Barrier Support Panel Installation

3.4.3.1. Cut panels as required so edges rest on center of upper ribs. Cut straight lines with adequate tools.

3.4.3.2. Where slopes change, boards will be cleanly cut to acquire deck shape. Place boards perpendicular to deck ribs for continuous support at extremities.

3.4.3.3. Board joints will be staggered and perfectly butted.

3.4.3.3.1. Refer to Detail 1 on Drawing No. A 4.03 for support panel staggering requirements.

3.4.3.4. Mechanically Attached Installation

3.4.3.4.1. Refer to Detail 2 on Drawing No. A 4.03 for the Mechanically Attached Installation Details.

3.4.3.4.2. Mechanically attach the vapour barrier support panels in accordance with the Mechanically Fastened Installation procedure in subsection 3.4.2. of Section 07 52 00, SBS Modified Bituminous Membrane Roofing.

3.4.3.5. Primer Installation

3.4.3.5.1. Prime all surfaces to be in contact with adhered membrane materials as required by the manufacturer. Apply primer at the rate of 0.75 gallon per 100 sq. ft. (2.8 litres per 9 sq. m.) or as recommended by roof membrane manufacturer's printed instructions to promote adhesion of membrane materials. Allow primer to flash prior to application of membrane materials to primed surface. Avoid flammable primer material conditions in torch applied membrane base flashing applications.

3.4.4. Vapour Barrier Installation

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

3.4.4.2. Unroll membrane onto the substrate for alignment parallel to roof edge.

3.4.4.3. Apply membrane straight and smooth and avoid wrinkles, fishmouths or trapped air bubbles in the finished installation.

3.4.4.4. Install vapour barrier membrane to all vertical surfaces to allow for a sealed connection with the base sheet membrane.

3.4.5. Fire Protection Tape Installation

3.4.5.1. Adhere the fire protection tape directly onto an approved substrate and firmly pressing the membrane onto the surface. Roll the membrane with a steel roller to ensure positive adhesion.

3.4.5.2. Cover all joints, cracks or open areas where flame can enter from subsequent torch welding of membranes.

3.4.6. Parapet and Curb Cover Board Installation

3.4.6.1. Install asphaltic core boards on the walls using plates and fasteners in accordance with the ARCA Technical Bulletin dated May 13, 2005. A copy of this bulletin has been included after this section.

3.4.7. Insulation Installation

3.4.7.1. General

3.4.7.1.1. Probe insulation for moisture content prior to installation. Insulation with elevated moisture content shall be marked and removed immediately from the site.

3.4.7.1.2. Apply insulation in two layers with staggered joints when total required thickness of insulation exceeds 3 inches (76 mm). Lay insulation so that continuous longitudinal joints are perpendicular to direction of roofing. Apply insulation with end joints staggered approximately 12 inches (305 mm) minimum. Tapered insulation is not required to be staggered between rows.

3.4.7.1.3. When using multiple layers of insulation, joints of each succeeding layer shall be parallel and offset in both directions with respect to layer below. Stagger insulation joints from the preceding layer 12 inches (305 mm) min. Fit insulation units snugly to each other and to all vertical surfaces. Remove and replace damaged units with new insulation or repair to provide a smooth surface and uniform insulation thickness. Joints between the individual pieces of insulation and vertical surfaces should be 1/4-inch (6 mm) max. Any joint greater than 1/4 inch (6 mm) must be filled with like material.

3.4.7.1.4. Insulation which can be readily lifted after installation is not considered to be adequately secured. Insulation shall be applied so that all roof insulation applied each day is waterproofed the same day.

3.4.7.1.5. Mechanically Attached Insulation

3.4.7.1.5.1. Refer to Detail 3 on Drawing No. A 4.03 for the Mechanically Attached Insulation Panel Details.

3.4.7.1.5.2. Mechanically attach the insulation panels in accordance with the Mechanically Fastened Installation procedure in subsection 3.4.2. of Section 07 52 00, SBS Modified Bituminous Membrane Roofing.

3.4.8. Factory Laminated Cover Board/Membrane Composite Panel Installation

3.4.8.1. Mechanically Attached Insulation

3.4.8.1.1. Refer to Drawing No. 2 on A 4.04 for the Mechanically Attached Laminated Cover Board/Membrane Composite Panel Details.

3.4.8.1.2. Mechanically attach the laminated cover board/membrane composite panel in accordance with the Mechanically Fastened Installation procedure in subsection 3.4.2. of Section 07 52 00, SBS Modified Bituminous Membrane Roofing.

3.4.8.1.3. All side laps to be sealed and end lap cover strip installed the same day as the composite panel.

3.4.9. SBS Membrane InstallationGeneral

3.4.9.1.1. Ensure substrate surfaces are warmed either naturally or by torch during the installation. Apply heat evenly to underside of roll membrane being installed and exposed side lap area of previously installed sheet in an L-pattern. Provide for slight, uniform flow of bitumen in front of roll

and full width of roll as the material is being rolled or set into place. Ensure the torch is facing downward, and is not blowing air under the membrane.

3.4.9.1.2. Apply uniform positive pressure to ensure membrane is fully adhered and all laps are sealed. Tool all end and side laps of the base sheet with a torch and heated trowel. Prior to forming lap over granulated surfaces, embed granules of the receiving sheet by heating and troweling-in the granules to form a uniform black compound surface.

3.4.9.1.3. Roll all lap areas with a weighted roller immediately after forming lap. Provide for visual bleed out of compound in lap area. Avoid overheating the membrane or burning through to membrane reinforcement. Membrane that is overheated shall be removed, or have an additional ply installed over top.

3.4.9.2. Base Sheet Installation

3.4.9.2.1. Underlying substrate must be inspected and free of abrasions and any other defects, and free of moisture, loose materials, debris, sediments, dust, and any other conditions required by the membrane manufacturer prior to base sheet installation. Beginning at the point of drainage (eaves or drains), apply one ply of smooth-surfaced modified bitumen membrane to the substrate. Align membrane and apply by the specified method with the proper side and end lap widths. Cut at a 45 degree angle across selvage edge of membrane to be overlapped in end lap areas prior to applying overlapping membrane.

3.4.9.2.2. Install reinforcing gussets at all inside and outside corners.

3.4.9.3. Phased Membrane Construction

3.4.9.3.1. Any delay in modified bitumen cap sheet installation will result in thorough cleaning of the applied membrane material surface and drying immediately prior to cap sheet installation. Priming of the applied membrane surface may be required at the discretion of the Contract Administrator prior to cap sheet installation.

3.4.9.4. Cap Sheet Installation

3.4.9.4.1. Underlying applied membrane must be inspected and repaired free of damage, holes, puncture, gouges, abrasions, and any other defects, and free of moisture, loose materials, debris, sediments, dust, and any other conditions required by the membrane manufacturer prior to cap sheet installation. Do not apply cap sheet if rain or frozen precipitation has occurred within the previous 24 hours. Beginning at the point of drainage (eaves or drains), apply one ply of granule-surfaced modified bitumen membrane to the smooth-surfaced modified bitumen membrane. Align cap membrane and apply by the specified method with the proper side and end lap widths. Cut at a 45 degree angle across selvage edge of cap membrane to be overlapped in end lap areas prior to applying overlapping cap membrane. Finished roof surfaces must have a uniform appearance throughout. Apply matching granules in any areas of bitumen bleed out while the asphalt is still hot.

3.4.9.5. Membrane Base Flashing

3.4.9.5.1. Base flashings shall be laced into the field plies. Install bituminous flashings at all curbs, walls and vertical surfaces where other types of flashings are not specified or shown on

drawings. Where possible or where indicated on the drawings, extend over the top of the vertical surface. Tie the base flashing into the waterproofing membrane and vapour barrier to form a complete envelope.

3.4.9.5.2. Apply two-ply modified bitumen strip flashing and sheet flashing in the angles formed where the roof deck abuts walls, curbs, ventilators, pipes, and other vertical surfaces, and where necessary to make the work watertight. Apply a strip of smooth-surfaced modified bitumen without voids, extending at least 4 inches (102 mm) on the roof and least 8 inches (203 mm) up the vertical surface. Lap sections a minimum of 3 inches (76 mm).

3.4.9.5.3. Apply a strip of granule-surfaced modified bitumen cap flashing without voids, extending at least 6 inches (152 mm) on the roof or 2 inches (51 mm) past the base sheet, and at least 8 inches (203 mm) up the vertical surface. Offset laps from the previous layer a minimum of 6 inches (152 mm). Lap the side ends at least 3 inches (76 mm).

3.4.9.5.4. Apply membrane flashing in accordance with the roof membrane manufacturers printed instructions and as specified. Cut at a 45 degree angle across terminating end lap area of cap membrane prior to applying adjacent overlapping cap membrane. Press flashing into place to ensure full adhesion and avoid bridging. Ensure full lap seal in all lap areas.

3.4.10. Prefabricated Pipe Flashings

3.4.10.1. Install prefabricated pipe flashings around all pipe penetrations in the roof. Set flange in a bed of compatible cement. Flash in flange with two overlapping layers of membrane as described in the paragraph *Membrane Strip Flashing* and seal the edge with compatible roof cement. Do not overheat EPDM Base Seal.

3.4.11. Membrane Strip Flashing

3.4.11.1. Set primed flanges of metal flashing in full bed of modified bituminous cement material and securely fasten through to attachment substrate over the base sheet. Strip flashings shall be laced into the field plies. Apply a strip of smooth-surfaced modified bitumen membrane without voids, 4 inches (102 mm) min beyond outer edge of flange. Lap sections a minimum of 3 inches (76 mm). Apply a strip of cap sheet without voids, extending at least 6 inches (152 mm) on the roof, 2 inches (51 mm) past the base sheet. Offset laps from the previous layer a minimum of 6 inches (152 mm). Lap the ends at least 3 inches (76 mm). Seal the edge with compatible roof cement.

3.4.12. Set-On Accessories

3.4.12.1. Where pipe or conduit blocking, supports and similar roof accessories are set on the membrane, adhere walk pad material to bottom of accessories prior to setting on roofing membrane. Specific method of installing set-on accessories must permit normal movement due to expansion, contraction, vibration, and similar occurrences without damaging roofing membrane. Do not mechanically secure set-on accessories through roofing membrane into roof deck substrate.

3.5. SITE QUALITY CONTROL

3.5.1. Construction Monitoring

3.5.1.1. During progress of the roof work, Contractor is responsible for making visual inspections to ensure compliance with specified parameters. Additionally, verify the following:

3.5.1.1.1. Equipment is in working order.

3.5.1.1.2. Materials are not installed in adverse weather conditions.

3.5.1.1.3. Substrates are in acceptable condition, in compliance with specification, prior to application of subsequent materials.

3.5.1.1.4. Materials comply with the specified requirements.

3.5.1.1.5. All materials are properly stored, handled and protected from moisture or other damages.

3.5.1.1.6. The proper number and types of plies are installed, with the specified overlaps.

3.5.1.1.7. Applied membrane surface is inspected, cleaned, dry, and repaired as necessary prior to cap sheet installation.

3.5.1.1.8. Membrane is without ridges, wrinkles, kinks, fishmouths, or other voids or delaminations.

3.5.1.1.9. Installer adheres to specified and detailed application parameters.

3.5.1.1.10. Associated flashings and sheet metal are installed in a timely manner in accordance with the specified requirements.

3.5.1.1.11. Temporary protection measures are in place at the end of each work shift.

3.5.2. Inspections

3.5.2.1. Manufacturer

3.5.2.1.1. The roofing product manufacturer can delegate a technical representative to visit the work site at the start of or during the roof installation. The contractor must at all times enable and facilitate access to the work by said representative. After each inspection, submit a report signed by the manufacturer's technical representative to the Contract Administrator within 3 working days.

3.5.3. Non-Conforming Work

3.5.3.1. Non-conforming Work must be removed and new materials installed in accordance with these specifications.

3.6. SCHEDULE

3.6.1. Roof Membrane Schedule

| | | | |
|----------------------------------|-----------------------------------|--|---|
| Roof Section | 1 & 2 | On Walls, Curbs and Combustible Substrates | Behind Cladding or Sheet Metal Or on Top of Through Wall Flashing |
| Vapour Barrier Support Panel | Densdeck Prime | N/A | N/A |
| Application Method | Mechanically | | |
| Vapour Barrier | Glass or polyester-reinforced SBS | Glass or polyester-reinforced SBS smooth | self-sealing SBS with a laminated woven polyethylene film facer |
| Application Method | Self-adhered | Self-adhered | Self-adhered |
| 1 st Insulation Layer | 3 inch (76 mm) PolyISO | N/A | N/A |
| Application Method | Mechanically | | |
| 2 nd Insulation Layer | 3 inch (76 mm) PolyISO | | |
| Application Method | Mechanically | | |
| Composite Panel | 3/16 (5 mm) Composite Panel | 1/8 inch (3 mm) Asphaltic Core Board | |
| Application Method | Mechanically | Mechanically Attached | |
| Base Sheet | N/A | SBS 180 Base Sheet | |
| Application Method | | Torch Applied | |
| Cap Sheet | SBS 250 Cap Sheet | SBS 250 Cap Sheet | |
| Application Method | Torch Applied | Torch Applied | |
| Cap Sheet Colour | Grey | Grey | |

END OF SECTION

ARCA Warranty Ltd.

2380 Pegasus Road N.E., Calgary, Alberta T2E 8G8 • Telephone (403) 250-7055 Calgary Exchange
1-800-382-8515 Toll Free (403) 250-1702 Fax

May 13, 2005

TECHNICAL BULLETIN

Asphalt Coreboard Application Procedure for Torch Adhered Modified Bitumen Membrane Flashing

For Certificate of Assurance issuance, the application of an asphalt coreboard underlay / covering, heat formed and fastened over combustible substrates permits the application of a torch adhered two ply modified bitumen membrane flashing.

The following procedure does not replace the use of self-adhering membrane flashing base sheets as outlined in the minimum requirement but provides the roofing contractor with an alternate method for modified bitumen membrane flashing application over combustible substrates as follows:

Cut minimum 3mm (1/8") thick asphalt coreboard sheets to length in maximum 1200mm (4 ft.) wide widths allowing for a minimum 75mm (3") wide side lap.

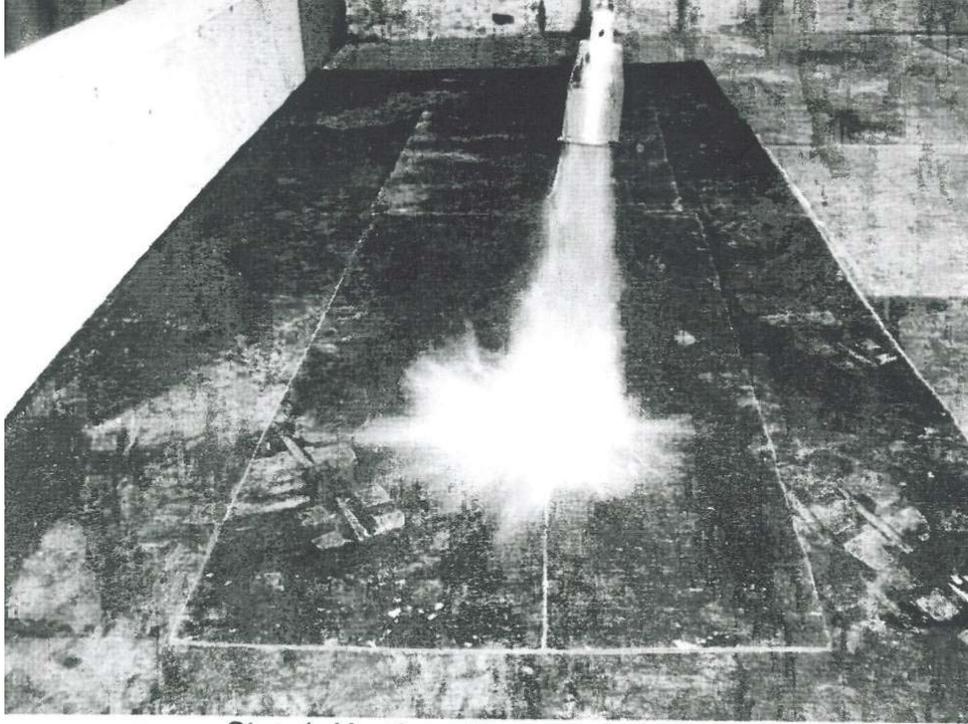
Away from any combustible surfaces, heat the back of the prepared coreboard panel in the area to be bent. Place the heated panel against the vertically up-stand and bend it horizontally until it conforms tightly to the parapet's profile. Heat form additional coreboard panels in a similar manner to completely cover all combustible surfaces.

Gaps, cracks and voids formed at inside / outside corners and at the primary membrane base sheet board junction must be covered with fire prevention tape prior to the attachment of the coreboard panels.

Place the heated formed coreboard panels over the combustible substrate with side laps overlapping a minimum distance of 75mm (3"). Fastened each coreboard panel with minimum 25mm (1") diameter round top nails placed at maximum 150mm (6") centres in the side laps and along the bottom of each panel. The round top nails securing the bottom of each coreboard panel shall be placed no lower than 50mm (2") above the surface of the primary membrane base sheet. The field of the asphalt core board shall be fastened to an ARCA accepted substrate with round top nails placed at a minimum spacing of one (1) fastener per one (1) square foot of surface area. Add additional round top nails where coreboard attachment is in doubt.

The two ply torch membrane flashing shall be adhered in accordance with the application standards outlined in the Modified Bitumen minimum requirements.

Please see attached drawing and photographs that illustrates the coreboard application procedure.



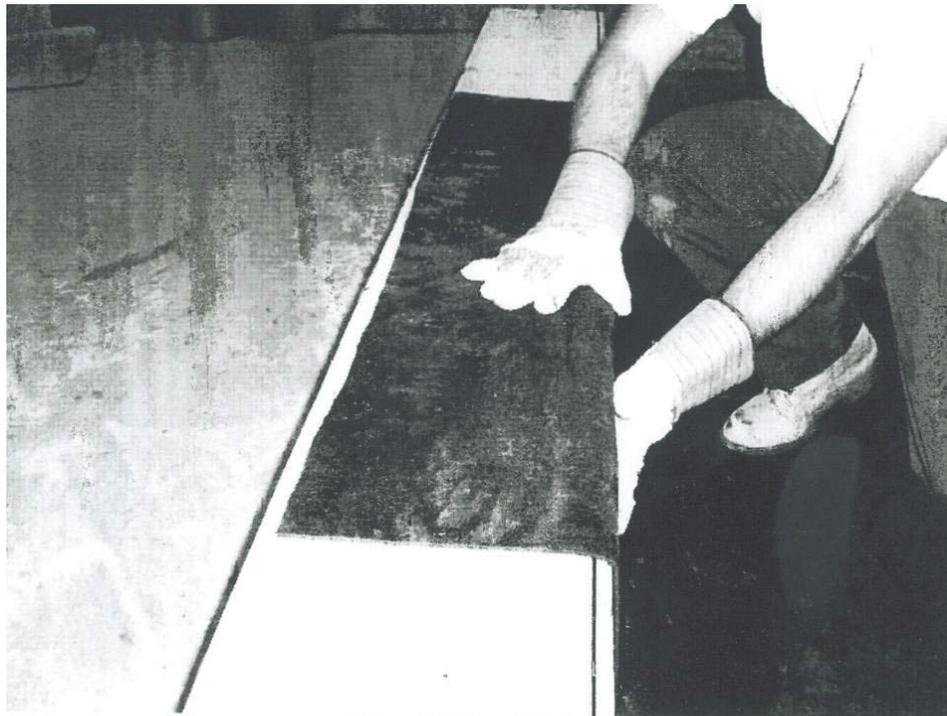
Step 1: Heating of the area to be bent.



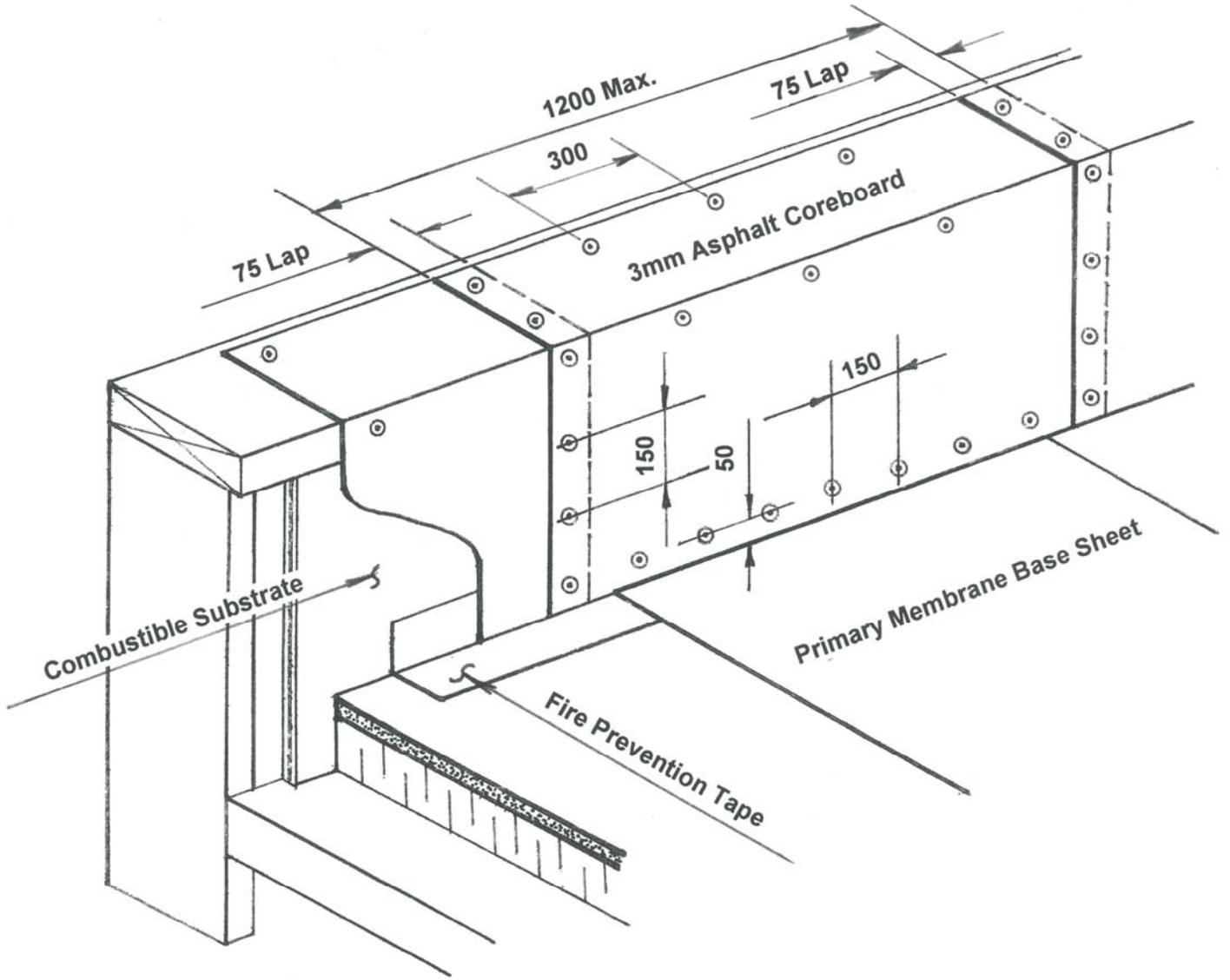
Step 2: Installation on the parapet.



Step 3: Bending the board.



Step 3: Final fitting.



SHEET METAL FLASHING AND TRIM SECTION 07 62 00

1. GENERAL

1.1. SUMMARY

1.1.1. Includes the fabrication and installation of sheet metal and related accessories. Finished sheet metalwork will form a weather-tight construction without waves, warps, buckles, fastening stresses or distortion, which allows for expansion and contraction. Responsible for cutting, fitting, drilling, and other operations in connection with sheet metal required to accommodate the work of other trades.

1.2. RELATED SECTIONS

1.2.1. Section 06 10 00 Rough Carpentry

1.2.2. Section 07 52 00 SBS Modified Bituminous Membrane Roofing

1.2.3. Section 07 92 00 Joint Sealants

1.3. REFERENCES

1.3.1. Reference Standards

1.3.1.1. NRCA Roofing and Waterproofing Manual

1.3.1.2. SMACNA Architectural Manual

1.4. DELIVERY, STORAGE, AND HANDLING

1.4.1. Storage and Handling Requirements

1.4.1.1. Package and protect materials during shipment. Uncrate and inspect materials for damage, dampness, and wet-storage stains upon delivery to the job site. Remove from the site and replace damaged materials that cannot be restored to like-new condition. Handle sheet metal items to avoid damage to surfaces, edges, and ends. Store materials in dry, weather-tight, ventilated areas until immediately before installation.

1.5. FIELD OR SITE CONDITIONS

1.5.1. Existing Conditions

1.5.1.1. Report any unacceptable existing conditions to the Contract Administrator immediately. Do not proceed until unsatisfactory conditions are corrected. Application of new materials shall constitute approval of the existing conditions by the Contractor.

1.6. WARRANTY

1.6.1. Installer's Warranty

1.6.1.1. Include all work performed under this section in the warranty in D.22.

2. PRODUCTS

2.1. DESCRIPTION

2.1.1. Materials

2.1.1.1. Conform to the requirements in these specifications and to the thicknesses and configurations established in SMACNA Arch. Manual for the materials. Different items need not be of the same metal, except as noted in this specification and that if copper is selected for any exposed item, all exposed items must be copper. Furnish sheet metal items in maximum 10 foot (3 m) lengths. Single pieces less than 10 feet (3 meters) long may be used to connect to factory-fabricated inside and outside corners, and at ends of runs. Fabricate corner pieces with minimum 12 inch (305 mm) legs unless otherwise noted. Provide accessories and other items essential to complete the sheet metal installation. Provide accessories made of the same or compatible materials as the items to which they are applied. Fabricate sheet metal items of the materials specified below and to the gage, thickness, or weight shown in Table I at the end of this section. Provide sheet metal items with a factory applied coating unless specified otherwise. Where more than one material is listed for a particular item in Table I, each is acceptable and may be used except as follows:

2.1.1.1.1. Exposed Sheet Metal Items

2.1.1.1.1.1. Must be of pre-coated galvanized steel, unless otherwise noted or if required to be soldered. Consider the following as exposed sheet metal: gutters, including hangers; downspouts; gravel stops and fasciae; cap, valley, stepped, base, and eave flashings and related accessories.

2.1.1.1.1.2. For sheet metal that is not prefinished, perform one of the following:

2.1.1.1.1.2.1. Apply paint primer over the exposed surfaces of the exposed sheet metal that is not prefinished and allow to thoroughly dry. Apply two coats of the approved paint to match the exposed sheet metal and flashing in accordance with the written instructions provided by the manufacturer.

2.1.1.1.1.2.2. Install cover plates on the exterior from the same prefinished metal used for the metal flashings on the project.

2.1.1.2. Pre-coated Galvanized Steel Sheet

2.1.1.2.1. ASTM A653 G90 zinc coating designation.

2.1.1.3. Stainless Steel

2.1.1.3.1. ASTM A167, Type 302 or 304, 2D Finish, fully annealed, dead-soft temper.

2.1.1.4. Aluminum Alloy, Extruded Bards, Rods, Shapes and Tubes

2.1.1.4.1. ASTM B221

2.2. ACCESSORIES

2.2.1. Solder

2.2.1.1. ASTM B 32, 95-5 tin-antimony.

2.2.2. Self-Adhering Underlayment

2.2.2.1. Polyethylene-sheet-backed, self-adhering, polymer-modified, bituminous sheet underlayment; complying with ASTM D 1970; minimum 40 mils (1 mm) thick. Provide primer when recommended by underlayment manufacturer.

2.2.3. Asphalt Primer

2.2.3.1. ASTM D 41

2.2.4. Fasteners

2.2.4.1. Use the same metal or a metal compatible with the item fastened. Use stainless steel fasteners to fasten dissimilar materials. Use appropriate fasteners to secure sheet metal to the substrate.

2.2.5. Splash Pads

2.2.5.1. Large precast concrete splash pad. Splash pad shall be 1 foot wide by 4 feet (305 mm by 1219 mm) long and sloped to promote drainage.

3. EXECUTION

3.1. EXAMINATION

3.1.1. Verification of Conditions

3.1.1.1. Inspect all surfaces to which metal is to be applied. Do not install metal unless surfaces are even, sound, clean, dry and free from defects which might affect the application.

3.2. INSTALLATION / APPLICATION

3.2.1. General

3.2.1.1. Follow recommendations of the current SMACNA Architectural Sheet Metal Manual for fabricating in-shop and on-site, and for installation, unless otherwise specified herein.

3.2.1.2. Follow published instructions of the product manufacturer for installation of extruded or proprietary metal products, unless otherwise specified herein.

3.2.1.3. Do not place dissimilar metals in direct contact or in positions where water sheds across both metals.

3.2.1.4. Any deviations to requirements in this Section shall be submitted to the Contract Administrator for approval along with documentation from a licensed engineer or testing firm that the revised detail meets the wind uplift requirements.

3.2.1.5. Workmanship

3.2.1.5.1. Make lines and angles sharp and true. Free exposed surfaces from visible wave, warp, buckle, and tool marks. Fold back exposed edges neatly to form a 3/4-inch (19 mm) hem on the

concealed side. Make sheet metal exposed to the weather watertight with provisions for expansion and contraction. Make surfaces to receive sheet metal plumb and true, clean, even, smooth, dry, and free of defects and projections. For installation of items not shown in detail or not covered by specifications conform to the applicable requirements of the current SMACNA Architectural Sheet Metal Manual.

3.2.1.5.2. Fabricate vertical faces with bottom edge formed outward 3/4 inch (19 mm) and hemmed to form drip.

3.2.1.6. Soldering

3.2.1.6.1. Solder metal joints for full metal surface contact. After soldering, wash metal clean with neutralizing solution and rinse with water.

3.2.1.7. Nailing

3.2.1.7.1. Confine nailing of flashing to one edge only. Space nails evenly not over 3 inch (76 mm) on center and approximately 1/2 inch (13 mm) from edge unless otherwise specified or indicated. Face nailing will not be permitted. Where sheet metal is applied to other than wood surfaces, include in shop drawings the locations for sleepers and nailing strips required to secure the work.

3.2.1.8. Cleats

3.2.1.8.1. Cleats shall be continuous unless otherwise specified or indicated. Unless otherwise specified, provide cleats of the same material and thickness as the sheet metal being installed.

3.2.1.9. Bolts, Rivets and Screws

3.2.1.9.1. Install bolts, rivets, and screws where indicated or required. Provide compatible washers where required to protect surface of sheet metal and to provide a watertight connection.

3.2.1.10. Seams

3.2.1.10.1. Make the seams straight and uniform in width and height with no solder showing on the face.

3.2.1.10.2. For seams and laps that are not soldered, apply a continuous bead of sealant between any lapped metal sections less than 3 inches (76 mm) and two continuous beads between any lapped metal sections greater than 3 inches (76 mm). The application of sealant after metal components have been lapped will not be accepted.

3.2.1.10.3. Flat Lock Seams

3.2.1.10.3.1. Not less than 1-1/2 inches (38 mm) wide, double locked without solder. Apply a continuous bead of sealant between the flanges in the seam.

3.2.1.10.4. Lap Seams

3.2.1.10.4.1. Finish soldered seams not less than one inch wide. Overlap seams not soldered not less than 3 inch (76 mm).

3.2.1.10.5. S-Lock Seams

3.2.1.10.5.1. Finish seams not less than 1 inch (25 mm) wide. Allow for 1/2 inch (13 mm) of movement for every 10 feet (3 meters). of flashing. Secure the female end of the seam to the substrate with appropriate fasteners 6 inches (152 mm) on center unless otherwise noted. Apply a bead of sealant in the lap.

3.2.1.10.6. Standing Seams

3.2.1.10.6.1. Not less than 1-1/2 inches (38 mm) high, double locked without solder. Apply a continuous bead of sealant between the flanges in the seam.

3.2.1.11. Primer

3.2.1.11.1. Prime all sheet metal flashings and trim that are to be set in or on asphalt or bituminous products with asphalt primer.

3.2.1.12. Aluminum

3.2.1.12.1. Do not allow aluminum surfaces in direct contact with other metals except stainless steel, zinc, or zinc coating. Where aluminum contacts another metal, paint the dissimilar metal with a primer followed by two coats of aluminum paint. Where drainage from a dissimilar metal passes over aluminum, paint the dissimilar metal with a non-lead pigmented paint.

3.2.1.13. Metal Surfaces

3.2.1.13.1. Paint surfaces in contact with mortar, concrete, or other masonry materials with alkali-resistant coatings such as heavy-bodied bituminous paint.

3.2.1.14. Wood and other Absorptive Materials

3.2.1.14.1. Paint surfaces that may become repeatedly wet and in contact with metal with two coats of aluminum paint or a coat of heavy-bodied bituminous paint.

3.2.1.15. Expansion and Contraction

3.2.1.15.1. Provide expansion and contraction joints at not more than 32 foot (10 meter) intervals for aluminum and at not more than 40 foot (12 meter) intervals for other metals. Provide an additional joint where the distance between the last expansion joint and the end of the continuous run is more than half the required interval. Space joints evenly.

3.2.2. Standard Metal Flashings and Trim

3.2.2.1. Cap Flashing

3.2.2.1.1. Refer to Detail 1 on Drawing No. A 5.08 for Cap Flashing Details.

3.2.2.1.2. Prefabricate in the shapes and sizes indicated and in lengths not less than 24 inches (610 mm). Provide prefabricated, mitered internal and external corners. Each leg shall be a min of 24 inches (610 mm).

3.2.2.1.3. Secure the outside vertical leg of the cap flashing to a continuous cleat nailed to the wood blocking. The drip edge shall be folded snugly over the cleat. Both vertical legs shall be 4 inches (102 mm) minimum, and counter flash the wall cladding 1 inch (25 mm) minimum.

3.2.2.1.4. Secure the inside leg of the cap flashing with appropriate watertight screws through slightly oversized holes at 24 inches (610 mm) OC max.

3.2.2.1.5. Join sections with an S lock seam. Secure the female end of the S-lock to the substrate with one fastener on each side and two on the top.

3.2.2.2. Curb Cover

3.2.2.2.1. Refer to Detail 6 on Drawing No. A 5.08 for Curb Cover Details.

3.2.2.2.2. Prefabricate from a single sheet of metal. Size the cover to fit the curb with less than 1/2-inch (13 mm) clearance on all sides once completed. Corners shall be lapped and soldered, or lapped, sealed and riveted. Vertical legs of the cover shall be 4 inches (102 mm) minimum and have a drip edge at the bottom.

3.2.2.2.3. Secure the vertical legs of the curb cover with appropriate watertight screws through slightly oversized holes at 24 inches (610 mm) OC max.

3.2.2.3. Fascia Extension

3.2.2.3.1. Refer to Detail 5 on Drawing No. A 5.08 for Fascia Extension Details.

3.2.2.3.2. Furnish and install fascia extension where the cap flashing outside vertical leg will exceed 6 inches (152 mm).

3.2.2.3.3. Secure the fascia extension to a continuous cleat nailed to the wood blocking. The drip edge shall be folded snugly over the cleat. Secure at the top edge with nails 24 inches (610 mm) on center.

3.2.2.3.4. Extend the fascia extension behind the cap flashing 2 inches (51 mm) minimum.

3.2.2.3.5. Notch and lap sections a minimum of 3 inches (76 mm).

3.2.2.4. Continuous Cleat

3.2.2.4.1. Refer to Detail 1 on Drawing No. A 5.08 for Continuous Cleat Details.

3.2.2.4.2. Form a continuous cleat with a 3-inch (76 mm) min vertical flange and a 3/4 inch (19 mm), 45° flange along the bottom.

3.2.2.4.3. Secure the cleat to the blocking with flat head screws penetrating a min of 1 inch (25 mm). Install the screws 6 inches (152 mm) OC max staggered 1-1/2 inches (38 mm) in the center of the vertical flange. Provide a minimum clearance of 1/2 inch (13 mm) between the screws and the top and bottom of the vertical flange.

3.2.2.4.4. Provide a 1/4-inch (6 mm) clearance between sections of the cleat.

3.2.2.5. Counter Flashing

3.2.2.5.1. Refer to Detail 6 on Drawing No. A 5.08 for Counter Flashing Details.

3.2.2.5.2. Install counter flashing over the horizontal and vertical termination of the base flashing and other materials.

3.2.2.5.3. Form counter flashing 4 inches (102 mm) min high, not including the section for termination or lapping behind wall cladding or other materials. Lap counter flashing over base flashing or other material 2 inches (51 mm) min.

3.2.2.5.4. Install counter flashing to provide a spring action against the base flashing.

3.2.2.5.5. Notch and lap sections a min of 3 inches (76 mm).

3.2.2.5.6. Notch and lap joints and inside corners. Notch and seam outside corners. Apply sealant or solder in the laps at corners.

3.2.2.5.7. Set vertical termination flange against the vertical surface in a solid bed of sealant. Furnish and install a termination bar and secure over the counter flashing using appropriate fasteners at 6 inches (152 mm) OC max.

3.2.2.5.8. Where the top edge of the counter flashing is lapped behind wall cladding, frame, existing sheet metal or other material, a cove is not required. Lap behind the other material a minimum of 2 inches (51 mm) or until refusal, but no less than 1 inch (25 mm).

3.2.2.6. Rain Collar Flashings

3.2.2.6.1. Refer to Detail 1 on Drawing No. A 5.06 for Rain Collar Flashing Detail.

3.2.2.6.2. Form new rain collar flashings over pipes and other penetrations that cannot be capped. Rain collar should extend past the pipe flashing 2 inches (51 mm) min and have a clearance above the pipe of 1/4-inch (6 mm) max. Secure the rain collar to the pipe with a metal draw band. Fill the cove with a non-shrink caulk. Lap the rain collar flashing a min of 1 inch (25 mm) and solder; or lap, seal and rivet.

3.2.2.7. Square to Round (Chimney) Flashing

3.2.2.7.1. Refer to Detail 1 on Drawing No. A 5.06 for Square to Round Flashing Detail.

3.2.2.7.2. Form new square to round flashing for pipe, chimney and other round penetrations through curbs.

3.2.2.7.3. Lap and solder all seams.

3.2.2.7.4. Flashing must extend down the sides of the curb 4 inches (102 mm) min. Secure the flashing to the curb with weather tight fasteners 24 inches (610 mm) OC.

3.2.2.7.5. Apply a bead of sealant between the flashing and the penetration. Secure the top of the flashing to the penetration with a band clamp.

3.2.2.7.6. Install a rain collar flashing over the top of the flashing.

3.2.3. Drainage Flashings and Trim

3.2.3.1. Gutters

3.2.3.1.1. Refer to Drawing No. A 5.09 for Gutter Detail.

3.2.3.1.2. Gutter size shall be a minimum of 4 inch by 6 inch (102 mm by 152 mm). The back of the gutter shall be 1 inch (25 mm) higher min than the front.

3.2.3.1.3. Slope gutters 1/8 inch (3 mm) per foot min.

3.2.3.1.4. Install prefabricated gutter spacers at 30 inches OC.

3.2.3.1.5. Lap gutter sections 2 inches (51 mm) min. Apply a continuous bed of sealant in the lap and install 2 rows of rivets 1 inch (25 mm) OC through the sealant.

3.2.3.1.6. Install end closures at gutter ends. Set the end closure inside the gutter and lap the end closure and the gutter 2 inches (51 mm) min. Apply a continuous bed of sealant in the lap and install 2 rows of rivets 1 inch (25 mm) OC through the sealant.

3.2.3.1.7. Provide butt type expansion joints in gutters at required spacing for the type material used to fabricate gutters.

3.2.3.1.8. Install a gutter screen in all gutters.

3.2.3.2. Downspouts

3.2.3.2.1. Refer to Drawing No. A 5.10 for Downspout Detail.

3.2.3.2.2. Install the downspouts at the locations shown on the approved shop drawings.

3.2.3.2.3. Downspouts shall be 4 inch by 5-inch min (102 mm by 127 mm).

3.2.3.2.4. Lap sections a minimum of 3 inches (76 mm) and secure sections with a minimum of 4 fasteners.

3.2.3.2.5. Form 45° elbow where water discharges onto the roof or ground.

3.2.3.2.6. Install new concrete splash blocks and support angles below all downspouts. Secure to the ground and support angle.

3.2.3.2.7. Provide transition pieces where new downspout sections tie into the new vandal proof HSS downspouts. Lap the section a min of 3 inches (76 mm).

3.2.3.2.8. Form downspout straps from the same material as downspouts using material not less than 2 gauges heavier than downspouts. Secure downspouts to wall with straps spaced not more than 4 feet (1219 mm) on center. Install a strap no more than 6 inches (152 mm) below the bottom of the gutter, and no more than 6 inches (152 mm) above the bottom of the downspout. Colour shall match the downspouts.

3.2.3.3. HSS Vandal Proof Downspouts

3.2.3.3.1. Furnish and install new HSS vandal proof downspouts at all new downspout locations and where existing downspouts are not vandal proof.

3.2.4. Sheet Metal Flashing and Trim for Low Slope Roofing

3.2.4.1. Perimeter Restraint Metal

3.2.4.1.1. Form new continuous perimeter restraint metal 4 inches high by 4 inches wide (102 mm high by 102 mm wide).

3.2.4.1.2. Furnish and install the perimeter restraint metal at all horizontal to vertical transitions.

3.2.4.1.3. Secure the metal to the vertical surface with fasteners and plates 24 inches (610 mm) on center max.

3.2.4.1.4. For insulation less than 6 inches (152 mm) thick, secure the metal to the deck through the insulation with plates and fasteners 24 inches (610 mm) OC.

3.2.4.1.5. For insulation more than 6 inches (152 mm) thick, install plates and fasteners through the horizontal flange 24 inches (610 mm) OC that extend into the insulation 5 inches (127 mm) min.

3.2.4.2. Pitch Pan Installation

3.2.4.2.1. Refer to Detail 1 on Drawing No. A 5.07 for Pitch Pan Details.

3.2.4.2.2. Size pitch pan to provide a minimum of 1-1/2-inch (38 mm) clearance between the flashed penetration and all sides of the pitch pan. In the event that multiple penetrations pass through the same pan, maintain 1-1/2-inch (38 mm) clearance between the individual penetrations.

3.2.4.2.3. The pitch pan shall be formed so that the top is in the horizontal plane to ensure that pourable sealer does not flow out.

3.2.4.2.4. Seam and solder all joints.

3.2.4.2.5. Height of pitch pan shall be a min of 4 inches (102 mm) above finished roof level. Extend horizontal flange onto the roof a min of 6 inches (152 mm).

3.2.4.2.6. Set the flange on top of the roof membrane in a solid application of compatible roofing cement. Mechanically attach the pitch box to the deck.

3.2.4.2.7. Seal the opening in the deck around the roof penetration to prevent leakage of material into the building interior.

3.2.4.2.8. Fill the bottom of the pitch pan to a depth of approximately 1 inch (25 mm) from the top of the pan with cement mortar mix.

3.2.4.2.9. Fill pan to the top with a pourable sealer. Insure that sealer fills all voids around penetrations.

3.2.4.2.10. Where possible, furnish and install a rain collar flashing over the pitch pan.

3.2.5. Sheet Metal Flashing and Trim for Steep Slope Roofing

3.2.5.1. Eave Flashing

3.2.5.1.1. Refer to Detail 1 on Drawing No. A 5.02 for Eave Flashing Details.

3.2.5.1.2. Form new eave flashing at gutters and rakes. The inner flange shall extend back from the edge of the deck 4 inches (102 mm) min. The vertical flange shall extend down the fascia 4 inches (102 mm) min.

3.2.5.1.3. Set the flange on top of the SBS base sheet in a solid application of compatible flashing cement.

3.2.5.1.4. Lap sections 3 inches (76 mm) min. At rakes, laps shall be installed so that water flows over the lapped joint and not against it. Apply a thick application of compatible flashing cement between lapped joints.

3.2.5.1.5. Nail through horizontal flange near center. Space nails 3 inches (76 mm) OC staggered 1 inch (25 mm) min.

3.2.5.1.6. At low eaves, strip in the flange with SBS base sheet. Extend the SBS base sheet past the edge of the flange onto the roof 6 inches (152 mm) min.

3.2.5.1.7. At gutters:

3.2.5.1.7.1. Install gutters before eave flashing.

3.2.5.1.7.2. The length of the fascia shall be a minimum of 3 inches (76 mm).

3.2.5.2. Fascia

3.2.5.2.1. Prefabricate in the shapes and sizes indicated and in lengths not less than 12 inches (305 mm). Flashing shall cover entire fascia board on the perimeter. Provide prefabricated, mitered internal and external corners.

3.2.5.2.2. Terminate the vertical flange of the fascia behind the eave flashing.

3.3. SITE QUALITY CONTROL

3.3.1. Non-Conforming Work

3.3.1.1. Non-conforming Work must be removed and new materials installed in accordance with these specifications.

3.4. CLEANING

3.4.1. Clean exposed sheet metal work at completion of installation. Remove grease and oil films, handling marks, contamination from steel wool, fittings and drilling debris, and scrub-clean. Free the exposed metal surfaces of dents, creases, waves, scratch marks, and solder or weld marks.

3.5. CLOSEOUT ACTIVITIES

3.5.1. Repairs to Finish

3.5.1.1. Scratches, abrasions, and minor surface defects of finish may be repaired in accordance with the manufacturer's printed instructions and as approved. Repair damaged surfaces caused by scratches, blemishes, and variations of colour and surface texture. Replace items which cannot be repaired.

3.6. PROTECTION

3.6.1. Protect installed sheet metal from damage.

3.7. SCHEDULE

| Table 1- Sheet Metal Gauges and Finish | | | |
|--|--|---------------------------|------------------------------------|
| Sheet Metal Item | Stainless Steel inch | Galvanized Steel Gauge | Finish |
| Cap Flashing | N/A | 24 | Factory applied coating |
| Curb Cover | N/A | 24 | Factory applied coating |
| Fascia | N/A | 24 | Factory applied coating |
| Cleat | N/A | 24 | Factory applied coating/galvanized |
| Counter Flashings | N/A | 24 | Factory applied coating |
| Rain Collar Flashing | 0.015 | 24 | Galvanized |
| Square to Round (Chimney) Flashing | N/A | 24 | Galvanized |
| Gutters | N/A | 24 | Factory applied coating |
| Downspouts and Leaders | N/A | 24 | Factory applied coating |
| Downspout Straps | N/A | 22 | Factory applied coating |
| Vandal Proof Downspouts | 4"x6" x3/16" HSS (102 mm x 152 mm x 5 mm) HSS | | Field applied coating |
| Perimeter Restraint | N/A | 22 | Factory applied coating |
| Pitch Pan | 0.015 | N/A | N/A |
| Eave Flashing | N/A | 24 | Factory applied coating |

END OF SECTION

JOINT SEALANTS SECTION 07 92 00

1. GENERAL

1.1. SUMMARY

1.1.1. Preparation of substrate surfaces and the installation of sealant and accessories.

1.2. RELATED SECTIONS

1.2.1. Section 07 62 00, Sheet Metal Flashing and Trim

1.3. REFERENCES

1.3.1. ASTM C920- Elastomeric Joint Sealants.

1.3.2. ASTM C1193 - Guide for Use of Joint Sealants.

1.3.3. ASTM C1311- Solvent Release Sealants.

1.3.4. ASTM C1330-02 - Cylindrical Sealant Backing for Use with Cold Liquid Applied Sealants.

1.3.5. ASTM C1401-09a - Guide for Structural Sealant Glazing.

1.3.6. CGSB-19-GP-14M - Sealing Compound, One Component, Butyl-Polyisobutylene Polymer Base, Solvent Curing.

1.3.7. CAN/CGSB-19.13-M - Sealing Compound, One-component, Elastomeric, Chemical Curing.

1.4. DELIVERY, STORAGE, AND HANDLING

1.4.1. Delivery and Acceptance Requirements

1.4.1.1. Accept materials on site in manufacturers unopened original packaging. Inspect for damage.

1.4.2. Storage and Handling Requirements

1.4.2.1. Store primers and sealants in cool dry location with ambient temperature range of 60-80°F (15-27°C), unless otherwise required by the manufacturer.

1.5. FIELD OR SITE CONDITIONS

1.5.1. Ambient Conditions

1.5.1.1. Do not install primers or sealants when atmospheric temperatures or joint surface temperatures are less than 40°F (4°C), unless otherwise required or permitted by the manufacturer.

1.5.2. Existing Conditions

1.5.2.1. Report any unacceptable existing conditions to the Contract Administrator immediately. Do not proceed until unsatisfactory conditions are corrected. Application of new materials shall constitute approval of the existing conditions by the Contractor.

1.6. WARRANTY

1.6.1. Installer's Warranty

1.6.1.1. Include the work of this section in the warranty in D.22

2. PRODUCTS

2.1. MANUFACTURERS

2.1.1. Manufacturer List

2.1.1.1. Tremco Sealant/Weatherproofing Division of RPM International, Inc.

2.1.1.2. BASF Building Systems

2.1.1.3. Pecora Corporation

2.2. DESCRIPTION

2.2.1. Materials, General

2.2.1.1. Compatibility: Provide joint sealants, backings, and other related materials that are compatible with one another and with joint substrates under conditions of service and application, as demonstrated by joint-sealant manufacturer, based on testing and field experience.

2.2.1.2. All Sealants shall be Type S, Grade NS, unless otherwise noted or approved in advance by the Contract Administrator. The Sealant Use shall be identified on the drawings, or field determined and approved.

2.2.2. Exterior Urethane Sealants

2.2.2.1. CAN/CGSB-19.37-M87, Classification MCG-2-25-A-N, No. 81026.

2.2.2.2. ASTM C 920, Type S, Grade NS, Class 25, Uses NT, M, A, O; single component, moisture curing, nonstaining, non-bleeding, colour as selected. BASF NP-1 or approved equivalent in accordance with B.7.

2.2.3. Exterior Silicone Joint Sealants

2.2.3.1. CAN2 -19.13-M82.; STM C 920, Type S, Grade NS, Class 50, Uses NT, G, A, O; single component, neutral curing, nonstaining, non-bleeding, colour as selected. Dow Corning 795 or approved equivalent in accordance with B.7.

2.2.3.2. ASTM C 920, Type S, Grade NS, Class 100/50, Use NT, G, M, A, and O; single component, neutral curing, non-staining, non-bleeding, colour as selected. Dow Corning 790 or approved equivalent in accordance with B.7.

2.2.4. Butyl Sealants

2.2.4.1. ASTM C-919; single component, non-curing, non-staining, non-bleeding, colour as selected. Pecora BA-98 or approved equivalent in accordance with B.7.

2.3. PERFORMANCE / DESIGN CRITERIA

2.3.1. Colours

2.3.1.1. Colours of exposed sealants to match the colour of the adjacent materials; sealant colours to be approved by Contract Administrator.

2.4. ACCESSORIES

2.4.1. Joint Sealant Backing

2.4.1.1. General: Provide sealant backings of material that are nonstaining; are compatible with joint substrates, sealants, primers, and other joint fillers; and are approved for applications indicated by sealant manufacturer based on field experience and laboratory testing.

2.4.1.2. Cylindrical Sealant Backings: ASTM C 1330, type C (closed-cell material with a surface skin) and of size and density to control sealant depth and otherwise contribute to producing optimum sealant performance. Diameter must be 25% greater than the width of the joint opening.

2.4.1.3. Bond-Breaker Tape: Polyethylene tape or other plastic tape recommended by sealant manufacturer for preventing sealant from adhering to rigid, inflexible joint-filler materials or joint surfaces at back of joint. Provide self-adhesive tape where applicable.

2.4.2. Miscellaneous Materials

2.4.2.1. Primer: Material recommended by joint-sealant manufacturer where required for adhesion of sealant to joint substrates.

2.4.2.2. Cleaners for Nonporous Surfaces: Chemical cleaners acceptable to manufacturers of sealants and sealant backing materials, free of oily residues or other substances capable of staining or harming joint substrates and adjacent nonporous surfaces in any way, and formulated to promote optimum adhesion of sealants to joint substrates.

2.4.2.3. Masking Tape: Nonstaining, nonabsorbent material compatible with joint sealants and surfaces adjacent to joints.

3. EXECUTION

3.1. EXAMINATION

3.1.1. Verification of Conditions

3.1.1.1. Inspect the substrate for any visible defects. Verify joint surfaces are clean and dry. Ensure concrete surfaces are fully cured.

3.1.2. Pre-installation Testing

3.1.2.1. Install test materials prior to installation. Allow the sealant to cure in accordance with the manufacturer's instructions. Install test materials to allow for one test for every substrate and joint type. Manufacturer's representative must perform the pre-installation testing.

3.1.2.2. Test Method

3.1.2.2.1. Manufacturer's standard field adhesion test to verify joint preparation and primer required to obtain optimum adhesion of sealants to joint substrate.

3.1.2.2.2. When test indicates sealant adhesion failure, modify joint preparation, primer, or both and retest until joint passes sealant adhesion test.

3.2. PREPARATION

3.2.1. Protection of In-Place Conditions

3.2.1.1. Use masking tape where required to prevent contact of sealant or primer with adjoining surfaces that otherwise would be permanently stained or damaged by such contact or by cleaning methods required to remove sealant smears. Remove tape immediately after tooling without disturbing joint seal.

3.2.2. Surface Preparation

3.2.2.1. Clean out joints immediately before installing joint sealants to comply with joint-sealant manufacturer's written instructions and the following requirements:

3.2.2.1.1. Remove all foreign material from joint substrates that could interfere with adhesion of joint sealant, including dust, paints (except for permanent, protective coatings tested and approved for sealant adhesion and compatibility by sealant manufacturer), old joint sealants, oil, grease, waterproofing, water repellents, water, surface dirt, and frost.

3.2.2.1.2. Clean porous joint substrate surfaces by brushing, grinding, mechanical abrading, or a combination of these methods to produce a clean, sound substrate capable of developing optimum bond with joint sealants. Remove loose particles remaining after cleaning operations above by vacuuming or blowing out joints with oil-free compressed air.

3.2.2.1.3. Clean nonporous joint substrate surfaces with chemical cleaners or other means that do not stain, harm substrates, or leave residues capable of interfering with adhesion of joint sealants.

3.2.3. Joint Priming

3.2.3.1. Prime joint substrates where recommended by joint-sealant manufacturer. Apply primer to comply with joint-sealant manufacturer's written instructions. Confine primer to areas of joint-sealant bond; do not allow spillage or migration onto adjoining surfaces.

3.3. INSTALLATION / APPLICATION

3.3.1. Comply with joint-sealant manufacturer's written installation instructions for products and applications indicated, unless more stringent requirements apply.

3.3.2. Install sealant backings of kind indicated to support sealants during application and at position required to produce cross-sectional shapes and depths of installed sealants relative to joint widths that allow optimum sealant movement capability:

3.3.2.1. Do not leave gaps between ends of sealant backings.

3.3.2.2. Do not stretch, twist, puncture, or tear sealant backings.

3.3.2.3. Remove absorbent sealant backings that have become wet before sealant application and replace them with dry materials.

3.3.2.4. Install joint backing to maintain the following joint ratios:

3.3.2.4.1. Joints up to 1/2 inch (13 mm) Wide: 1:1 width to depth ratio.

3.3.2.4.2. Joints Greater than 1/2 inch (13 mm) Wide: 2:1 width to depth ratio; maximum 1/2-inch joint depth.

3.3.3. Install sealants using proven techniques that comply with the following and at the same time backings are installed:

3.3.3.1. Place sealants so they directly contact and fully wet joint substrates.

3.3.3.2. Completely fill recesses in each joint configuration.

3.3.3.3. Produce uniform, cross-sectional shapes and depths relative to joint widths that allow optimum sealant movement capability.

3.3.3.4. Tool joints to a concave shape unless otherwise noted.

3.4. SITE QUALITY CONTROL

3.4.1. Non-Conforming Work

3.4.1.1. Non-conforming Work must be removed and new materials installed in accordance with these specifications.

3.5. CLEANING

3.5.1. Clean off excess sealant or sealant smears adjacent to joints as the Work progresses by methods and with cleaning materials approved in writing by manufacturers of joint sealants and of products in which joints occur.

3.6. PROTECTION

3.6.1. Protect joint sealants during and after curing period from contact with contaminating substances and from damage resulting from construction operations or other causes so sealants are without deterioration or damage at time of Substantial Completion. If, despite such protection, damage or deterioration occurs, cut out and remove damaged or deteriorated joint sealants immediately so installations with repaired areas are indistinguishable from original work.

3.7. SCHEDULE

| Application | Sealant Type |
|-------------|--------------|
|-------------|--------------|

| | |
|--|---|
| Control and expansion joints in cast-in-place concrete | ASTM C 920, Type S, Grade NS, Class 50, Uses NT, G, A, O; single component, neutral curing, nonstaining, non-bleeding, colour as selected. Dow Corning 795 or approved equivalent in accordance with B.7. |
| Joints between precast concrete units | |
| Control and expansion joints in unit masonry | |
| Control and expansion joints in stone masonry | |
| Butt joints between metal panels | ASTM C 920, Type S, Grade NS, Class 50, Uses NT, G, A, O; single component, neutral curing, nonstaining, non-bleeding, colour as selected. Dow Corning 795 or approved equivalent in accordance with B.7. |
| Joints between different materials listed above | |
| Control and expansion joints in soffits and overhead surfaces | ASTM C 920, Type S, Grade NS, Class 50, Uses NT, G, A, O; single component, neutral curing, nonstaining, non-bleeding, colour as selected. Dow Corning 795 or approved equivalent in accordance with B.7. |
| Other exterior joints in vertical surfaces and non-traffic horizontal surfaces for which no other sealant is specified | |
| Bedding and lap joints between sheet metal flashing and other materials not listed below. | ASTM C 920, Type S, Grade NS, Class 25, Uses NT, M, A, O; single component, moisture curing, nonstaining, non-bleeding, colour as selected. BASF NP-1 or approved equivalent in accordance with B.7. |
| Bedding and lap joints in gutters, downspouts, drains and scuppers | ASTM C-919; single component, non-curing, non-staining, non-bleeding, colour as selected. Pecora BA-98 or approved equivalent in accordance with B.7. |

END OF SECTION

FACILITY FALL PROTECTION SECTION 11 24 29

1. GENERAL

1.1. SUMMARY

1.1.1. Includes the installation of new fall protection equipment and their accessories.

1.2. RELATED SECTIONS

1.2.1. Section 06 10 00 Rough Carpentry

1.2.2. Section 07 52 00 SBS Modified Bituminous Membrane Roofing

1.2.3. Section 07 92 00 Joint Sealants

1.3. REFERENCES

1.3.1. Reference Standards

1.3.1.1. CAN/CSA Z91-02 Health and Safety Code for Suspended Equipment Operations

1.3.1.2. CAN/CSA-G40.21M-300W Structural Quality Steels

1.3.1.3. CAN/CSA – S16.1 Limit States Design of Steel Structures

1.3.1.4. CSA W59 Welded Steel Construction (Metal Arc Welding)

1.3.1.5. CSA-W47.1 Certification of Companies for Fusion Welding of Steel Structures

1.3.1.6. ASTM A52 Standard Pipe Sections

1.3.1.7. ASTM A325 High Strength Bolts for Structural Steel

1.4. SUBMITTALS

1.4.1. Shop Drawings

1.4.1.1. Submit to the Contract Administrator the Shop Drawings for the installation of the new walkway.

1.5. DELIVERY, STORAGE, AND HANDLING

1.5.1. Delivery and Acceptance Requirements

1.5.1.1. All materials shall be delivered in manufacturer's original packaging. The contractor shall thoroughly inspect product upon receipt and report damaged material immediately to delivering carrier and note such damage on the carrier's freight bill of lading.

1.5.2. Storage and Handling Requirements

1.5.2.1. Store materials in a dry, protected, well-vented area.

1.6. FIELD OR SITE CONDITIONS

1.6.1. Existing Conditions

1.6.1.1. Report any unacceptable existing conditions to the Contract Administrator immediately. Do not proceed until unsatisfactory conditions are corrected. Application of new materials shall constitute approval of the existing conditions by the Contractor.

2. PRODUCTS

2.1. Walkways

2.1.1. Walkway must be prefabricated metal, corrosion resistant, lightweight, raised, anti-skid, free draining, level, and 36 inches (914 mm) wide minimum. Maximum load per lineal foot for the platform with all accessories and components (guardrails, etc.) must be less than 25 lbs.

2.2. Fixed Guardrail

2.2.1. Prefabricated metal, corrosion resistant, permanent pedestrian egress barrier system secured to the platform. Top rail must be 42 inches (1,067 mm) above the walking surface and the intermediate rail installed at the midpoint between the top rail and the walking surface. Guardrail must have a 5 inch (127 mm) high minimum toe board installed directly above the walking surface.

3. EXECUTION

3.1. EXAMINATION

3.1.1. Existing dimensions, elevations, access and clearances shall be site verified by the Contractor prior to commencement of construction and fabrication of any materials. Co-ordinate existing dimensions and elevations with new construction shown on the detail drawings. Notify the Contract Administrator immediately if existing site dimensions and elevations conflict with those indicated on the drawings.

3.1.2. Unless otherwise stated, all work shall meet or exceed minimum requirement of the current edition of the National Building Code of Canada, associated standards referenced in that code, and local standards and bylaws as applicable. Comply with the CAN/CSA Z91 Standard.

3.1.3. Do not scale drawings.

3.2. INSTALLATION / APPLICATION

3.2.1. General

3.2.1.1. All interior structure that will be visible must be painted to match the existing on-site conditions. Touch ups will be required to any surfaces that may become damaged in the installation of the structure or anchors.

3.2.1.2. Ceilings that have to be cut open to access the interior of the roof structure must be covered with a painted fire rated access panel to match the existing ceiling.

3.2.1.3. If it is necessary to disconnect the electrical service to any electrical or mechanical units within the roof/ceiling structure or in the interior of the facility, notice must be given to the Contract Administrator.

3.2.1.4. The Contractor is responsible for daily interior cleaning that is a direct result of the work being completed.

3.2.1.5. The contractor is to protect all flooring materials from damage in all work areas.

3.2.1.6. The Contractor shall be responsible for any interior or exterior damage that is a direct result of the Work.

3.2.1.7. Supply and install all structural reinforcements and materials as identified on the drawings. All visible materials must be painted to match onsite conditions.

3.2.1.8. Walkways

3.2.1.8.1. Install walkways as shown on the drawings. Walkway must extend from the point of access to the appliance or appliances.

3.2.1.8.2. Walkway must have a fixed guardrail installed on at least one side. Guardrail must be installed on the side that is closest to the nearest fall hazard, or on the downslope side, as indicated on the drawings. Walkway must have a guardrail installed on both sides when the walkway is within 6 feet 7 inches (2 m) of a fall hazard, and as shown on the drawings.

3.2.1.8.3. Walkway shall not penetrate the roof.

3.3. SITE QUALITY CONTROL

3.3.1. Inspections

3.3.1.1. Notify the Contract Administrator 48 hours' min before enclosing the anchors from view. All fall arrest equipment attachments to the structure must be inspected and approved by the Contract Administrator.

3.3.2. Non-Conforming Work

3.3.2.1. Non-conforming Work must be removed and new materials installed in accordance with these specifications.

END OF SECTION

PLUMBING
SECTION 22 00 00

1. GENERAL

1.1. SUMMARY

1.1.1. Includes furnishing and installing new vent pipe extensions.

1.2. RELATED SECTIONS

1.2.1. Section 06 10 00 Rough Carpentry

1.2.2. Section 07 52 00 SBS Modified Bitumen Membrane Roofing

1.2.3. Section 07 92 00 Joint Sealants

1.3. WARRANTY

1.3.1. Manufacturer Warranty

1.3.1.1. Materials shall be free of defects in material for a period of five years from the date of purchase. Should a part fail to function in normal use within this period, manufacturer shall furnish a new part at no charge.

1.3.2. Include the work of this section in the warranty in D.22.

2. PRODUCTS

2.1. Vent Pipe Extensions

2.1.1. Vent Pipe

2.1.1.1. Match existing material and diameter.

2.1.1.2. ASTM D 2661 Schedule 40 Solid Wall ABS Pipe, matching the existing pipe diameter.

2.1.2. Vent Pipe Metal Flashings

2.1.2.1. Metal Flashings are required for all vent pipe penetrations. Refer to Section 07 52 00, SBS Membrane Roofing.

2.2. Transition Couplings

2.2.1. General

2.2.1.1. Fitting for joining piping with small differences in outside diameters or of different materials.

2.2.1.2. Elastomeric or rubber sleeve-type, reducing or transitioning pattern. Include shear ring and stainless steel metal tension band and tightening mechanism (band clamp) on each end.

3. EXECUTION

3.1. PREPARATION

3.1.1. Inspect all existing roof drainage systems and plumbing vents to ensure they are open and working properly and all connections and supports are in good condition before commencing the work. Confirm the Rain Water Leader (RWL) dimensions on-site for both new and replacement drains to be installed in each facility. Notify the Contract Administrator prior to doing any work, of any drainage systems or plumbing vent found to be plugged, damaged or inoperative.

3.1.2. Remove and replace existing ceilings as required to perform the work. Demolition of walls is not required. Install an access panel in all ceilings that have to be cut open to access the roof drains and rain water leaders. Paint to match the existing ceiling. Include all labour and materials required for the installation of the plumbing and repair to the interior finishes.

3.2. INSTALLATION / APPLICATION

3.2.1. General

3.2.1.1. New plumbing shall be water tight.

3.2.2. Pipe Extensions

3.2.2.1. Prior to the installation of any new roofing materials, extend all existing soil pipe vents through the roof to a minimum height of 18 inches (457 mm) (or as required by local plumbing codes) above the finished roof surface. Modifications shall be performed as follows:

3.2.2.1.1. Cut off pipe at a point below the deck in a neat manner. Use a transition coupling to secure the new pipe to the existing.

3.3. SITE QUALITY CONTROL

3.3.1. Non-Conforming Work

3.3.1.1. Non-conforming Work must be removed and new materials installed in accordance with these specifications.

END OF SECTION

HEATING, VENTILATING AND AIR CONDITIONING DIVISION 23

1. GENERAL

1.1. SUMMARY

1.1.1. This Section includes labour, materials, equipment and related services to install new HVAC piping, ducting, conduit and supports.

1.2. RELATED SECTIONS

- 1.2.1. Section 06 10 00 Rough Carpentry
- 1.2.2. Section 07 52 00 SBS Modified Bitumen Membrane Roofing
- 1.2.3. Section 07 62 00 Sheet Metal Flashing and Trim
- 1.2.4. Section 07 92 00 Joint Sealants

1.3. REFERENCES

- 1.3.1. SMACNA 1966

1.4. DELIVERY, STORAGE, AND HANDLING

- 1.4.1. Store and handle materials in accordance with manufacturer's instructions.
- 1.4.2. Keep materials in manufacturer's original, unopened containers and packaging until installation.
- 1.4.3. Store materials in clean, dry area.
- 1.4.4. Protect materials during storage, handling, and installation to prevent damage.

1.5. FIELD OR SITE CONDITIONS

- 1.5.1. Existing Conditions

1.5.1.1. Report any unacceptable existing conditions to the Contract Administrator immediately. Do not proceed until unsatisfactory conditions are corrected. Application of new materials shall constitute approval of the existing conditions by the Contractor.

1.6. WARRANTY

- 1.6.1. Installer Warranty
 - 1.6.1.1. Include all work performed under this section in the warranty in D22.

2. PRODUCTS

2.1. MATERIALS

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2.1.1. Supports

2.1.1.1. Supports shall be pre-manufactured, non-penetrating and capable of supporting the anticipated loads. Supports shall be manufactured from materials that are UV stable, and shall have a service life to match that of the specified roof system. Supports shall allow for movement of the pipes with damaging the roof system. Wood blocking is not acceptable.

2.1.1.1.1. C-Port roof blocks

2.1.1.1.2. Or approved equivalent in accordance with B.7.

2.1.2. Bird Netting

2.1.2.1. New bird netting shall consist of polypropylene with a ¾ inch mesh size. Netting shall be weatherproof and UV stable. Mounting clips must be accompanied with watertight fasteners.

3. EXECUTION

3.1. INSTALLATION / APPLICATION

3.1.1. Roof Top gas line supports

3.1.1.1. Install rooftop pipe supports in accordance with manufacturer's instructions.

3.1.1.2. Apply proper adhesion method, if required to adhere rooftop pipe supports to membrane roofing.

3.1.2. Gas Lines

3.1.2.1. Repaint and reinstall the removed gas lines.

3.1.3. Existing Roof Top Units

3.1.3.1. Reinstall the existing roof top units. Test the units for operability and balance the system. Check for overheating motors, belt adjustments, alignment, et cetera. Provide a copy of Balance Report to the Contract Administrator. Balancing shall be done when system is fully installed and operational.

3.1.4. Bird Netting

3.1.4.1. Furnish and install new bird netting and accessories in accordance with manufacturer's instructions. Ensure netting is overlapped a minimum of 12 inches at joining locations. Mounting clips to be installed a minimum of 36 inches on center.

3.2. SITE QUALITY CONTROL

3.2.1. Non-Conforming Work

3.2.1.1. Non-conforming Work must be removed and new materials installed in accordance with these specifications.

END OF SECTION