BRAMPTON

Corporate Support Services
Purchasing

October 23, 2024 **(39 pages)**

ADDENDUM NO. 4

BID CALL NO. T2024-276

ADDITION AND RENOVATION AT BRAMPTON MEMORIAL ARENA

This Addendum is part of the Bid Document.

1. **Bid Closing:**

   The Closing Date has been extended from NOT LATER THAN 2:00:00 pm LOCAL TIME on FRIDAY OCTOBER 25, 2024, TO:

   NOT LATER THAN 2:00:00 O'CLOCK P.M. LOCAL TIME ON TUESDAY OCTOBER 29, 2024.

2. **Pertaining to Specifications and Drawings:**

   Refer to attached Consultant Addendum No. 5 (Total 38 pages)

3. ***Questions and Responses***

   Q.1 What is the existing intrusion system in the Brampton Memorial Arena?

   A.1 The intrusion system installed at Memorial is as per City's security standards issued with Addendum 2. It's a DSC power series intrusion system, a zone expander will be required to add additional zones.

All other terms & conditions remain unchanged**.**

If you have any questions, please do not hesitate to contact the undersigned.

Bidders are required to acknowledge all Addenda.

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ADDENDUM NO.05

The tender and contract documents for the Brampton Memorial Arena Expansion at 69 Elliot Street, Brampton, ON for the City of Brampton, are hereby amended as follows:

1.0 Bid Documents:

1.1 Architectural Drawings
Delete the previously issued architecture drawing A8.1 to ***Add*** the attached architecture drawing. (Issued for Tender Addendum 5, 2024.10.23)

1.2 ***Delete*** specification 08 36 00 Sectional Steel Overhead Doors originally issued with the bid documents in its entirely.

1.3 ***ADD*** attached specification 08 33 00 Insulated Rolling Service Door - Addendum 5.

1.4 ***Delete*** specification 07 51 30 Built Up Asphalt Roofing originally issued with the bid documents in its entirely.

1.5 ***ADD*** attached specification 07 51 13 Built up Bituminous Roofing - Addendum 5.

1.6 ***ADD*** attached specification 07 52 16 Modified Bituminous Membrane Roofing - Addendum 5.

2.0 Bid Questions:

2.1 **Question:**
- Could you please confirm if door 102.2 should be type XP02.1, and if the material is aluminum?
- Can you confirm whether the vision glass at the exterior windows includes bird-friendly ceramic frit? According to section 08 51 00, item 2.1.6, it does not specify the inclusion of ceramic frit (please see the attached snapshot for reference).
- Please confirm the finish for the exterior aluminum cladding?

Answer:
- Door 102.2 is a new hollow metal door replacing the existing arena door with panel P01.1. Refer updated drawing A8.1 issued for tender addendum 5 and detail 07/A4.7, issued for tender.
- All exterior glazing will have Bird Safety Glass according to Section 2.1.6 of Specification 08 80 50 Glass and Glazing.
- The exterior aluminum modular plate system will have clear anodized finish. Refer specification 07 42 44 Aluminum Modular Plate System.

2.2 **Question:** Addendum #2 references Epoxy Floor Coatings, the room finish schedule does not note any Epoxy Floor Coatings. Is SC (Sealed Concrete) to actually be Epoxy Floor Coating? If so, do these areas require an epoxy wall base or Rubber base or nothing? If not, where are the Epoxy Floor Coatings being used, and what type of Sealer is to be used for the SC locations?

Answer:
Disregard the epoxy floor description provided as a response to Question 2.2 in Tender Addendum 2.
For type of sealer, refer answer 2.14, addendum 3.

ADDENDUM NO.05

2.3 **Question:** In reference to the overhead door, could you please clarify the following:
Is the door motorized? What is the headroom clearance above the door opening? What is the side room clearance to allow for the motor installation, if a motor is required? Please confirm side room clearance. Is the door sitting on a half wall?
Answer:
Refer specification 08 33 00 Insulated Rolling Service Door - addendum 5.

2.4 **Question:** RFI for Miscellaneous Metal Specification 05 05 00 - please clarify, where are those items on the drawings? Do we need to price them?
SCOPE OF WORK
.1 Supply and install stairs, guards, handrails, handrail standoffs and roof access ladders, and
elevator pit ladder
Supply and install steel bollards, security gates, decorative metal fencing.
Provide hoist beam for elevator
Provide stainless steel handrail components and stainless steel guards where indicated on
drawings. GUARDS BEHIND BUTT JOINT GLASS
1. 16mm x 51mm brushed stainless steel flat bar post and top rail as indicated on drawings – post
spacing to line up with glass butt joint location
thank you,
Answer:
There is a fixed ladder between the two roofs which would be applicable to this section. None of the other specified items are relevant to this project.

2.5 **Question:** Please advise if there is hoist beam for elevator in this project. I picked up on spec division 05 50 00.
Answer: This section is not relevant to this project.

2.6 **Question:** Regarding the roofing scope of this tender, are we to follow what is listed on the roofing schedule in the drawings on page A0.2 Issued for Tender Addendum 3 – 2024.10.16 or are we to follow what is listed in the specifications section 07 52 31 Built-Up Asphalt Roofing? There is a significant cost difference between the 4-ply/2-ply system (listed on Arch drawing A0.2) and the 3 ply system (listed in specification section 07 51 31).
Answer: Refer specification 07 51 13 Built up Bituminous Roofing - Addendum 5 and specification 07 52 16 Modified Bituminous Membrane Roofing - Addendum 5.

2.7 **Question:** Addendum # 2 mentioned that the overhead door is roll-up door by Cookson. Please provide specifications. We could only find Overhead door specifications in the package.
Answer: Refer answer 2.3, issued for Tender Addendum 5.

END OF ADDENDUM 5

1 GENERAL

1.1 GENERAL INSTRUCTIONS

1. Read and conform to:

    1. CCDC 2 - 2008, Stipulated Price Contract as amended in the Contract Documents.
    2. Division 1 requirements and documents referred to therein.

1.2 SUMMARY

1. Section Includes: Provide built up bituminous roofing system including but not limited to following:

    1. cleaning deck surface.
    2. roof sheathing.
    3. vapour retarder.
    4. roof insulation.
    5. roof insulation overlay.
    6. roof membrane and flashings.
    7. gravel surfacing and/or precast pavers.
    8. roof accessories.
    9. roof walkways.

2. Related Sections: Following description of work is included for reference only and shall not be presumed complete:

    1. Reglets, through wall flashings and air/vapour barrier installation: Section 04 20 00, Masonry Units.
    2. Metal deck roof substrate: Structural.
    3. Provision of wood blocking: Section 06 10 00, Rough Carpentry.
    4. Provision of tongue and groove wood decking: Section 06 15 00, Wood Decking.
    5. Supply of miscellaneous air/vapour barriers to complete continuity of air/vapour barrier integrity: Section 07 25 00, Miscellaneous Air/Vapour Barriers.
    6. Supply of prepainted flashings: Section 07 62 00, Sheet Metal Flashing and Trim.
    7. Sealants except for sealant required for roof flashings: Section 07 92 00, Joint Sealants.
    8. Supply and installation of roof drains: Division 22, Plumbing.
    9. Vent pipes and connection of vent pipes: Division 22, Plumbing.
    10. Prefabricated curbs for mechanical equipment on roof and counter flashings for ducts passing through roof: Division 23, Heating, Ventilating and Air Conditioning.

1.3 REFERENCES

1. Abbreviations and Acronyms:

    1. CRCA: Canadian Roofing Contractors' Association; www.roofingcanada.com.
    2. EVT: Equiviscous Temperature.
    3. FBT: Finish Blowing Temperature.
    4. FM: Factory Mutual Global; www.fmglobal.com.
    5. FP: Flash Point.
    6. LTTR: Long Term Thermal Resistance.
    7. OBC: Ontario Building Code.
    8. OIRCA: Ontario Industrial Roofing Contractors' Association; www.ontarioroofing.com.
    9. ULC: Underwriters' Laboratories of Canada; www.ulc.ca.

2. Definitions: Conform to ASTM D1079 for glossary of terms and definitions of roofing terminology.

    1. Reference Standards:
    2. ASTM C208-08a - Specification for Cellulose Fibre Insulating Board
    3. ASTM C920-11 - Standard Specification for Elastomeric Joint Sealants

4. ASTM C1177/C1177M-08 - Standard Specification for Glass Mat Gypsum Substrate for Use as Sheathing
5. ASTM D92-05a(10) - Standard Test Method for Flash and Fire Points by Cleveland Open Cup Tester
6. ASTM D312-00(06) - Standard Specification for Asphalt Used in Roofing
7. ASTM D1079-10 - Standard Terminology Relating to Roofing, Waterproofing, and Bituminous Materials
8. ASTM D1863-05 - Standard Specification for Mineral Aggregate Used on Built-Up Roofs
9. ASTM D2178-04 - Standard Specification for Asphalt Glass Felt Used in Roofing and Waterproofing
10. ASTM D3273-00(05) - Standard Test Method for Resistance to Growth of Mold on the Surface of Interior Coatings in an Environmental Chamber
11. ASTM D4263-83(05) - Standard Test Method for Indicating Moisture in Concrete by the Plastic Sheet Method
12. ASTM D4397-08 - Standard Specification for Polyethylene Sheeting for Construction, Industrial, and Agricultural Applications
13. ASTM E84-10b - Standard Test Method for Surface Burning Characteristics of Building Materials
14. ASTM E136-11 - Standard Test Method for Behavior of Materials in a Vertical Tube Furnace at 750°C
15. CGSB 37-GP-9Ma - Primer, Asphalt, Unfilled, for Asphalt Roofing, Dampproofing and Waterproofing
16. CGSB 37-GP-56M - Membrane, Modified, Bituminous, Prefabricated, and Reinforced for Roofing
17. CSA A123.4-04 - Asphalt for Use in Construction of Built-Up Roof Coverings and Waterproofing Systems
18. CSA A231.2-06 - Precast Concrete Pavers
19. CSA B111-74(03) - Wire Nails, Spikes and Staples
20. CAN/ULC-S102-07 - Standard Method of Test for Surface Burning Characteristics of Building Materials and Assemblies
21. CAN/ULC-S107-03 - Standard Methods of Fire Tests of Roof Coverings
22. CAN/ULC-S114-05 - Standard Method of Test for Determination of Non-Combustibility in Building Materials
23. CAN/ULC-S126-06 - Standard Method of Test for Fire Spread Under Roof Deck Assemblies
24. CAN/ULC-S702-97 - Standard for Mineral Fibre Thermal Insulation for Buildings
25. CAN/ULC-S704-03 - Standard for Thermal Insulation, Polyurethane and Polyisocyanurate, Boards, Faced
26. CAN/ULC-S770-03 - Standard Test Method for Determination of Long-Term Thermal Resistance of Closed Cell Thermal Insulating Foams

1.4 ADMINISTRATIVE REQUIREMENTS

1. Preinstallation Meetings:

    1. Arrange pre-installation meeting 1 week prior to commencing work with parties associated with trade as designated in Contract Documents or as requested by Consultant. Presided over by Contractor, include Consultant who may attend, Subcontractor performing work of this trade, testing company's representative and consultants of applicable discipline. Review Contract Documents for work included under this trade and determine complete understanding of requirements and responsibilities relative to work included, storage and handling of materials, materials to be used, installation of materials, sequence and quality control, Project staffing, restrictions on areas of work and other matters affecting construction, to permit compliance with intent of work of this Section.

    2. Review installation procedures and coordination required with related work including roofing requirements for interfacing with roof accessories and roof mounted equipment.

3. Review methods and procedures related to roofing installation, including manufacturer's written instructions.

4. Review and finalize construction schedule and verify availability of materials, Installer's personnel, equipment and facilities needed to make progress and avoid delays.

5. Examine deck substrate conditions and finishes for compliance with requirements, including flatness and fastening.

6. Review structural loading limitations of roof deck during roofing.

7. Review base flashings, special roofing details, roof drainage, roof penetrations, equipment curbs and condition of other construction that will affect roofing system.

8. Review governing regulations and requirements for insurance and certificates if applicable.

9. Review temporary protection requirements for roofing system during and after installation.

10. Review roof observation and repair procedures after roofing installation.

2. Scheduling:

    1. Co-operate fully with other Subcontractors on the Work and promptly proceed with this work as rapidly as job conditions permit.
    2. Supply items to be built in, in ample time to be incorporated into work of other Subcontractors as it is carried up. Proceed with insulation, roofing and flashing work as soon as walls and roof decks are ready to receive same.

1.5 SUBMITTALS

1. Product Data: Submit Product data on membrane, bitumen and flashing materials.

2. Shop Drawings:

    1. Submit Shop Drawings in accordance with Section 01 30 00 showing method of installation and layout of each layer, fastening and flashings at edges, flashing of protrusions and penetrations, details of insulation and vapour retarder and securement details of sheathing.
    2. Ensure Shop Drawings are approved and signed by manufacturer's representative.

3. Samples: Submit samples in accordance with Section 01 30 00. Submit following samples in sizes indicated:

    1. insulation: 300 mm x 300 mm (12" x 12") square.
    2. roof membrane: 300 mm x 300 mm (12" x 12") square.
    3. stone aggregate: 200 mm (8") square x 50 mm (2") deep box.

4. Test and Evaluation Reports:

    1. If requested, provide Product test reports based on evaluation of comprehensive test performed by manufacturer and witnessed by a qualified independent testing agency for components of roofing system.

    2. Indicate components of roofing system comply with requirements of these specifications including quantity, statistical and descriptive data for each Product and other data pertaining to date, time and temperature for each load of bulk asphalt.

1.6 CLOSEOUT SUBMITTALS

1. Operational and Maintenance Data:

    1. Supply necessary maintenance data and repair instructions for binding into maintenance manuals described in Section 01 70 00.

    2. Bind into each maintenance manual, Project name, location, dated and executed copy of manufacturer's guaranty, described herein and name, address and phone number of nearest manufacturer's representative. Include recommendations for periodic inspections, care and maintenance. Identify common causes of damage with instructions for temporary patching until permanent repair can be made.

1.7 QUALITY ASSURANCE

1. Qualifications:

    1. Manufacturers: Company specializing in manufacturing Products specified in this Section with minimum 10 years successful experience.

    2. Installers: Provide work of this Section executed by competent installers fully conversant with standards, methods and techniques required, with minimum of 5 years experience in application of Products, systems and assemblies specified and with approval and training of Product manufacturers. Ensure roofer is qualified and approved by membrane manufacturer and is a member in good standing in CRCA.

2. Conform to CRCA's "CRCA Roofing Specifications Manual – 2011", except where indicated or specified otherwise.

3. Do roofing work employing roofing Products, roof sheathing, plates and fasteners recommended by FM data for wind uplift requirements.

4. More stringent requirements in Consultant's opinion governs.

1.8 DELIVERY, STORAGE AND HANDLING

1. Delivery and Acceptance Requirements: Deliver materials to site, properly protected, with manufacturer's seals and labels intact. Carefully unload and place in temporary storage in a manner to prevent damage thereto.

2. Storage and Handling Requirements:

    1. Store materials in dry location, in original containers with manufacturer's wrappers and seals intact. Carefully place in temporary storage in a manner to prevent damage thereto.
    2. Keep membrane materials dry, stored in rolls standing on end, selvage edge up, elevated from contact with moisture, at temperatures not less than 5 deg C (41 deg F) or more than 49 deg C (120 deg F) and pre-conditioned before installation. Handle rolls with care to avoid crushing, puncturing or other damage. Ensure selvage edge is not damaged during handling and banding strips are removed before application of membrane. Do not use wet or damp membrane.
    3. Do not expose insulation and roof sheathing to wet weather. Store and handle insulation to prevent broken edges and corners, punctures, indentations or other damage. Remove damaged insulation from site.
    4. Ensure bitumen delivered in form of cartons has manufacturer's material identification label on each carton; if in form of bulk tanker delivery, ensure each shipment is accompanied by written certificate from manufacturer confirming material identification including following information:
        1. Softening Point per ASTM D312 or CSA A123.4.
        2. Minimum FP per ASTM D92.
        3. EVT.
        4. FBT.

5. Do not intermix different types or grades of bitumen in bulk shipments.

6. Protect sheet metal materials from bending and scratching.

7. Store materials at site within temporary sheds or trailers; such facilities must be well sealed and kept at least 3 deg C (5 deg F) warmer than exterior ambient temperature to ensure materials remain dry in terms of roofing. Do not use wet, damp, frozen or damaged materials. Stack rolls of felt on end.

8. Do not store more than 1 Day's supply of materials on roof at any time. On roof, stack materials on pallets, and completely cover with incombustible waterproof tarpaulin whenever work is interrupted, or when there is precipitation of any kind. Securely tie covering to pallets in such way as to be weather tight. Plastic covers and shrinkwrap covers by manufacturers are not acceptable for site storage and be removed upon delivery to roof.

9. Distribute materials stored on roof to stay within designated live load limits of the roof construction. Provide ample bases under equipment and materials to distribute weight to conform to these live-load limits. Do not store materials on, or transport materials across, completed roof areas without providing protection covering specified herein. Do not overload roofing structure.

10. Store combustible materials away from heat and open flames. Protect and store materials in dry, ventilated area away from welding flame, spark and from elements or harmful substance.

11. Do not lift rigid insulation in slings which will damage edges. Remove damaged insulation and replace with new material at no cost to Owner.

1.9 SITE CONDITIONS

1. Ambient Conditions:

    1. Do not apply any part of the roofing system over damp materials, or during a period of damp weather.

    2. Apply roofing only when air and surface temperatures are acceptable to manufacturer for application of their Product.

1.10 WARRANTY

1. Manufacturer Warranty:

    1. Warrant work of this Section using manufacturer's standard form of warranty for a period of 10 years against defects and/or deficiencies (total membrane system warranty; labour, material and workmanship) in accordance with General Conditions of the Contract. Promptly correct any defects or deficiencies which become apparent within warranty period and render roofing membrane to a watertight condition to satisfaction of Consultant and at no expense to Owner.

    2. In addition to above, provide to Owner a written warranty covering defects of workmanship for a period of 2 years commencing from date of Substantial Performance of the Work and agree to Make Good promptly any defects which occur or become apparent within warranty period in conjunction with membrane manufacturer's warranty. Ensure warranty is on either CRCA's or OIRCA's "Standard Form of Warranty".

2 PRODUCTS

2.1 MANUFACTURERS

1. Manufacturer List: Products of following manufacturers are acceptable subject to conformance to requirements of Drawings, Schedules and Specifications:

    1. Georgia-Pacific Canada, Inc.; www.gpgypsum.com

2. IKO Industries Ltd.; www.iko.com
3. Lexcan Ltd; www.lexcan.com
4. Soprema; www.soprema.ca
5. Tremco; www.tremcoroofing.com

2.2 MATERIALS

1. Description:

    1. Regulatory Requirements:

        1. Fire Hazard Classification: ULC Class C. Ensure complete roof meets ULC requirements for Class C as applicable roof and other authorities having jurisdiction.

2. Performance/Design Criteria:

    1. Roof Type 1 (R1): Provide 4 ply hot asphalt applied membrane roofing work over metal deck including but not limited to following:

        1. metal deck (by others).
        2. roof sheathing.
        3. vapour retarder (2 plies of organic felt mopped in asphalt).
        4. base rigid insulation boards.
        5. tapered insulation.
        6. insulation overlay board.
        7. 4 plies felts mopped in asphalt.
        8. modified bituminous base ply in hot asphalt and cap sheet flashings torched on.
        9. mineral aggregate.
        10. roof walkways. 2.2.2.1.11.
        11. precast concrete pavers.

3. General: Ensure materials are compatible and satisfactory to roofing manufacturer. Ensure roofing materials are manufactured by 1 manufacturer and comply as a minimum with requirements of local jurisdictional authorities. Select appropriate type of insulation on basis of its total compatibility when incorporated into roofing system, including that of substrate, required thermal value as well as their ability to adhere components permanently and in a rigid manner in finished roofing system.

4. Roof Sheathing: Provide 1 of following:

    1. Supply gypsum glass mat reinforced silicone treated board conforming to ASTM C1177/C1177M, non-combustible according to ASTM E136/CAN/ULC-S114 thermal barrier as tested to UL 1256/CAN/ULC-S126, flame spread 0, smoke developed 0 to ASTM E84/CAN/ULC-S102 and ASTM D3273 with a rating of 10, no mould growth after 4 weeks exposure, 6 mm (1/4") or for fire rating requirement 16 mm (5/8") thick gypsum board 1200 mm (4') wide, maximum practical length, tapered edge as required, "DensDeck Prime Roof Board" by Georgia-Pacific Canada, Inc.

    2. Supply gypsum-fiber roof board conforming to ASTM C1278/C1278M, non-combustible according to ASTM E136/CAN/ULC-S114 thermal barrier as tested to UL 1256/CAN/ULC-S126, flame spread 5, smoke developed 0 to ASTM E84/CAN/ULC-S102 and ASTM D3273 with a rating of 10, no mould growth after 4 weeks exposure, 6 mm (1/4") or for fire rating requirement 16 mm (5/8") thick gypsum board 1200 mm (4') wide, maximum practical length, tapered edge as required, "Securock® Gypsum-Fiber Roof Board" by CGC Inc.

5. Fasteners:

    1. Factory-coated steel fasteners and metal or plastic plates designed for fastening roofing membrane components to substrate; tested by manufacturer for required pullout strength; and

acceptable to roofing system manufacturer. Ensure fasteners engage in steel deck a minimum of 19 mm (3/4").
2. "Premium No 12, UltraFast" hexagonal head fastener coated for corrosion resistance complete with locking plastic plates or galvalume metal plates, "Lexgrip Fasteners" or "Lexgrip Striker Anchors" complete with stress plate by Lexcan Ltd.
3. Screws: Zinc and dichromate plated.
4. Nails: Non-ferrous or galvanized steel, flat head, barbed roofing nails. CSA B111, Table 12, size and type to suit application.
5. Metal Plates: 75 mm x 75 mm (3" x 3") with stiffening ribs as recommended by manufacturer.
6. Metal Discs: Flat caps of 25 mm (1") minimum diameter, 0.759 mm (22 ga) minimum sheet metal, formed to prevent dishing. No discs are required with roofing nails having 25 mm (1") diameter solid cap heads.

6. Asphalt Primer: CGSB 37-GP-9Ma, "Lexsuco Asphalt Primer" by Lexcan Ltd.

7. Bitumen: Roofing asphalt to meet specified requirements of CSA A123.4, Type 1, 2 or 3.

8. Felt (Glass Fibre): Glass fibre based roofing felt to meet requirements of ASTM D2178, Type IV, "IKO Glass Type IV" by IKO Industries Ltd., or "Vanguard Type IV Glass Ply Sheet" by Lexcan Ltd.

9. Adhesive: Fire resistant adhesive as recommended by felt manufacturer.

10. Vapour Retarder Sheet: "AmourGuard Vapour Retardant" by IKO Industries Ltd. or "Permate Vapour Retarder" by Lexcan Ltd.

11. Roof Insulation:

    1. Rigid Polyisocyanurate Insulation Boards: Square edged, closed cell polyisocyanurate foam manufactured using Hydrocarbon (HC), Zero Ozone Depleting Potential (ZeroODP) HCFC free blowing agents and integrally laminated to heavy, non-asphaltic, fibre reinforced, felt facers, meeting requirements of CAN/ULC-S704, Type 2, Class 2, CAN/ULC-S126 and CAN/ULC- S107. Provide total thickness as shown on Drawings and following:
        1. Multiple Layers: Ensure maximum thickness for 1 layer of insulation is 66 mm (2.6") having compressive strength of 140 kPa (20 psi) and LTTR R-value of 15 when determined in accordance with CAN/ULC-S770 per square edged layer.
        2. Dimension Stability: 2% maximum linear change when conditioned at 70 deg C (158 deg F) and 97% relative humidity for 7 Days; curing time 24 hours minimum, plus an additional 24 hours minimum per inch (25 mm) of thickness, at a minimum of 16 deg C (60 deg F) before shipment from manufacturer.
        3. Ensure maximum board size for loose laid and mechanically attached insulation boards is 1200 mm x 2400 mm, (4' x 8'), maximum board size for insulation boards adhered to substrate is 1200 mm x 1200 mm (4' x 4').
        4. Ensure insulation is without limitations devoid of face-sheet delamination, edge cavitation, cupping, bowing, crushing or powdering. Provide thermal value and in multiple layers to thickness shown on Drawings. Provide "ACFoam-II" by Atlas Roofing Corporation, "Protect F/R/S" by ModuIR TS, "IKOtherm" by IKO Industries Ltd. or "Firestone ISO 95+GL" with perforated black glass reinforced mat laminated to face by Firestone Building Products Company.

    2. Tapered Insulation: ASTM C208, Type II, Grade 2, asphalt coated fibreboard, minimum compressive strength of 172 kPa (25 psi), regular density, taper cut to provide slopes indicated, on computer controlled machine and sequence packed and code with detailed installation instructions, but never less than 13 mm (1/2") thick by Posi-Slope Enterprises Inc. or Accu- Plane Enterprises Inc.

12. Insulation Overlay Board: Provide 1 of following:

    1. Gypsum glass mat reinforced silicone treated board conforming to ASTM C1177/C1177M, non-combustible according to ASTM E136/CAN/ULC-S114 thermal barrier as tested to UL

1256/CAN/ULC-S126, flame spread 0, smoke developed 0 to ASTM E84/CAN/ULC-S102 and ASTM D3273 with a rating of 10, no mould growth after 4 weeks exposure, 6 mm (1/4") thick gypsum board 1200 mm (4') wide, maximum practical length, tapered edge as required, "DensDeck Prime Roof Board" by Georgia-Pacific Canada, Inc.

2. Gypsum-fiber roof board conforming to ASTM C1278/C1278M, non-combustible according to ASTM E136/CAN/ULC-S114 thermal barrier as tested to UL 1256/CAN/ULC-S126, flame spread 5, smoke developed 0 to ASTM E84/CAN/ULC-S102 and ASTM D3273 with a rating of 10, no mould growth after 4 weeks exposure, 6 mm (1/4") thick gypsum board 1200 mm (4') wide, maximum practical length, tapered edge as required, "Securock® Gypsum-Fiber Roof Board" by CGC Inc.

13. Single layer insulating system combining base insulation and tapered insulation will not be accepted as substitute to multi layer insulating system.

14. Insulation Adhesive: As recommended by insulation manufacturer.

15. Joint Tape: Coated, glass fibre joint tape 100 mm to 150 mm (4" to 6").

16. Cant Strips: 38 mm x 89 mm (1-1/2" x 3-1/2") asphalt coated fiberboard or perlite or glass fibre insulation, surface with glass reinforced mat, coated and adhered with asphalt and poly film, 60 mm x 60 mm (2-3/8" x 2-3/8").

17. Flashing Base Sheet Membrane and Gussets:
    1. CGSB 37-GP-56M, Type 2, Class P, Plain Surfaced, Grade 2 Heavy duty service.
    2. Flashing base sheet membrane having a non-woven polyester and glass grid reinforcement (130 -140 g/m^2) and SBS modified bitumen. Top face protected by a thermofusible plastic film and self adhesive underface covered by silicone release plastic film. Ensure membrane is minimum 3 mm (1/8") thick.
    3. Summer grade for application at temperature above 10 deg C (50 deg F) and winter grade for application between -10 deg C (14 deg F) and 10 deg C (50 deg F).

18. Primer: Primer to enhance adhesion of self adhesive membranes on porous surfaces compatible with self adhesive under face as recommended by flashing base sheet manufacturer.

19. Flashing Cap Sheet Membrane:
    1. CGSB 37-GP-56M, Type 2, for exposed roofing application; Class G, Granule surfaced; Grade 2 Heavy duty service.
    2. Ensure roofing and flashing cap sheet membrane have non-woven polyester reinforcement 250 g/m2 and thermofusible elastomeric asphalt. Ensure top face is self protected with coloured ceramic granules and under face is protected by thermofusible plastic film. Ensure membrane is minimum 3.5 mm (0.138") thick and be applied by torching only.
    3. Ensure colour of ceramic granules on cap sheets are selected by Consultant from manufacturer's standard range.

20. Sealant: Non-sag type, 1 component polyurethane sealant conforming to ASTM C920, Type S, Grade NS, Class 25, Use NT, G, M, A and O. Supply in standard colours as selected.

21. Plastic Roofing Cement: "Hydroshield 451 Mastic" by Lexcan Ltd.

22. Mineral Aggregate: ASTM D1863, round or crushed stone 25 mm (1") clear size stone, free of fines or stones smaller than 16 mm (5/8") or larger than 35 mm (1-3/8"). Ensure most stones are 20 mm (3/4") to 30 mm (1-3/16") in size

23. Concrete Pavers: Precast concrete conforming to CSA A231.2 having a minimum strength of 35 MPa, steam cured, 4% and 6% entrained air, with edges chamfered and non-slip finish, 610 mm x 610 mm x 64 mm (24" x 24" x 2-1/2") thick.

24. Concrete Pavers Pedestals: Black plastic mouldings, complete with spacers; "Pave-El Model 5X" by

Envirospec Inc.; www.envirospecinc.com

25. Concrete Paver Supporting Pads: Extruded polystyrene insulation, "Roofmate" by Dow Chemical, 150 mm x 150 mm x 25 mm (6" x 6" x 1") thick.

3 EXECUTION

3.1 EXAMINATION

1. Verification of Conditions:

    1. Report any defects or irregularities in roof deck detrimental to roof application. Do not proceed until corrected.
    2. Check deck is properly installed with required slopes to attain positive drainage and drains are connected.
    3. Ensure openings, walls and projections through deck are completed and affixed and reglets and nailing strips are in place prior to membrane installation. Cooperate with mechanical and/or electrical Divisions as necessary.
    4. Ensure deck substrate scheduled to receive roof system is smooth, dry, clean and free of sharp projections.

2. Evaluation and Assessment: Commencement of work implies acceptance of previously completed work.

3.2 PREPARATION

1. Protection of In-Place Conditions:

    1. Protect walls where hoisting is necessary. Locate kettles so smoke and fumes will not discolour building or adjacent buildings or become a nuisance to adjacent Owners or the public.

    2. Temporarily block drain pipes during application of roofing membrane. Remove blocking each night or when work is not in progress and after work of this Section is completed.

2. Surface Preparation:

    1. Immediately before any roofing materials are applied, clean decks of roughness, rubbish, dust, dirt, oil, grease, snow, and ice perfectly clean and dry. Remove ice and snow and dry decks. Do not use salt or calcium to remove snow or ice.

    2. Do no roofing during rain, fog, sleet or snow, or upon surfaces covered with dust, water, dew, ice, frost, snow and similar conditions.

    3. Ensure sleeves, anchors, and other items to be secured to or pass through roof surfaces are installed. Verify that units and curbs are properly secured in place.

3.3 INSTALLATION

1. Cold Weather Application:

    1. Remove moisture from substrate before application of membrane.
    2. Follow daily weather forecasts to determine commencement of work or to anticipate possible suspension.
    3. Store roofing felt rolls in heated storage until ready to use. Bring out to work area only enough rolls for immediate use.
    4. Mopping temperatures of asphalt are critical (minimum 204 deg C (400 deg F)) and unrolling of membrane must be done immediately. Limit mop strokes to 1200 mm (48") ahead of roll.
    5. Before starting mop stroke, pull roll tightly against cooled asphalt, so as to eliminate any air pockets

or voids that may have occurred during previous mop stroke.

2. Install roofing membrane and membrane flashings in accordance with manufacturer's printed directions.

3. Install corners, pipe seals and flashing protrusions in accordance with manufacturer's details.

4. Apply roofing as soon as possible after roof deck is finished and to meet Project construction schedule.

5. Adjustments to specified roofing procedures caused by weather and site conditions are subject to Consultant's acceptance.

6. Maintain equipment in good working order to ensure control of roofing operations and protection of work.

7. Ensure each part of roofing system is completely bonded to other unless otherwise specified.

8. Secure roofing around perimeter as required to meet requirements of jurisdictional authorities.

9. Lay roofing plies free from wrinkles, air pockets, fishmouths, tears, and prominent lap joints. Embed them in a uniformly spread layer of bitumen.

10. Extend roofing sheets to outer edges of roof and up vertical surfaces.

11. Ensure flame heated equipment are located as specified herein before.

12. Maintain constant supervision of kettles to ensure bitumen is not overheated. Check temperature of bitumen in kettle every 10 to 15 minutes with an accurate thermometer constantly available at, but not attached to each kettle. Do not use bitumen which is outside of specified temperature range. Dispose, away from Place of the Work, bitumen heated in excess of highest temperature recommended for its type by manufacturer and that is either on roof or at kettle.

13. Complete entire roofing system including aggregate up to line of termination of each Day's work. If aggregate cannot be applied during this period, ensure roofing membrane is protected by a continuous and uniform coating of bitumen.

14. Roof Sheathing on Metal Deck:

    1. Place roof sheathing with long axis of each sheet transverse to ribs, with end joints staggered and fully supported on ribs. Butt boards together to moderate contact. Adjust spacing so screws are centred on ribs.
    2. Hold roof sheathing in-place as required by site conditions until covered by complete roof system.
    3. Apply roof sheathing on steel roof deck with fire retardant adhesive. Apply ribbons of adhesive along top of flutes of steel deck. Embed roof sheathing in adhesive with closely butted joints. Ensure joints are staggered.
    4. Mechanically fasten roof sheathing within a 1200 mm (4') margin around perimeter of roof deck. Use approved mechanical fasteners and plates at rate and pattern recommended by manufacturers. Provide minimum 4 screws per board.
    5. Tape joints in roof sheathing.
    6. Temporarily cover roof sheathing not covered by membrane at the end of each Day's Work with polyethylene film.

15. Vapour Retarder Over Roof Sheathing:

    1. Install vapour retarder so it provides continuous barrier. Overlap and seal to adjacent air/vapour barrier at top of parapets and curbs to ensure air/vapour barrier continuity of building envelope. Repair punctures of vapour retarder caused by subsequent work.
    2. Mop roof sheathing with uniform and continuous coating of asphalt. Roll 2 plies of felt in hot asphalt, lapping each sheet 480 mm (19") over preceding sheet and mopping full 480 mm (19") under each

lap leaving no area un-mopped. Use 1.2 kg/m^2 (25 lbs/sq) per ply. Seal lap joints.

3. Reinforce vapour retarder on steel roof deck at perimeters of membrane with 300 mm (12") wide strip of felt sheet material, secured to vapour retarder either using adhesive or with hot asphalt mopping.

16. Cants: Install cants at intersections of roofing and vertical surfaces except where indicated otherwise on Drawings. Install in accordance with manufacturer's recommendations, in continuous bed of hot asphalt applied to insulation overlay. Lay true to line, level and with flush, butt joints and accurate corner mitres.

17. Insulation:

    1. Before laying insulation, inspect vapour retarder and repair damage, if any. Ensure surface is free of wrinkles, air pockets, fishmouths or tears.
    2. Over vapour retarder, apply full mopping of hot asphalt at minimum rate of 1.0 kg/m^2 (20 lb/sq) and embed first layer of insulation.
    3. Lay roof insulation except boards with ship lapped edges, in 2 layers, in hot asphalt, top side up in parallel courses and stagger end joints in adjacent courses and stagger joints in adjacent layers. Bring each board into moderate contact with adjacent boards and do not force into place.
    4. Cover entire area of base insulation with tapered insulation. Lay in accordance with manufacturer of tapered insulation's Shop Drawings, with joints staggered from insulation joints. Lay each layer in full mopping of hot asphalt. Tape joints in top layer of insulation.
    5. Cover entire area of tapered insulation with insulation overlay board. Lay in full mopping of asphalt, except where sloped insulation is susceptible to heat then follow manufacturer's instructions.
    6. Where insulation and insulation overlay board abuts an irregular surface, scribe to profile thereof, elsewhere cut insulation square and neatly to provide plain butt joints at perimeter of insulation, at curbs and other vertical objects and surfaces.
    7. Lay only as much roof insulation and insulation board overlay that can be covered on same Day with roofing membrane. At conclusion of Day's work, seal exposed edges. Upon resumption of work, cut and remove sealed edges, square, neat and straight.
    8. Reduce thickness of insulation at drains by 13 mm (1/2") for 1200 mm (48") square centred on each drain to ensure free flow to drain.
    9. Keep insulation, tapered insulation and insulation board overlay dry at all times.

18. Bitumen Application:

    1. Locate kettles near roofing operation.
    2. Maintain constant supervision of kettles to ensure bitumen is not overheated. Check temperature of bitumen in kettle every 10 to 15 minutes with an accurate thermometer constantly available at, but not attached to each kettle. Do not use bitumen which is outside of specified temperature range. Dispose, away from Place of the Work, bitumen heated in excess of highest temperature recommended for its type by manufacturer and that is either on roof or at kettle.
    3. Heat asphalt to ensure optimum viscosity for applicator but to no higher temperature than recommended by manufacturer. Do not heat asphalt to or above 260 deg C (500 deg F). Maintain EVT at pour.
    4. Do not apply at temperature lower than EVT. Restrain asphalt temperature at point of application to EVT +/-15 deg C (25 deg F).
    5. Do not heat and hold asphalt above FBT for more than 4 hours.
    6. Equip foreman with portable stem thermometer for checking temperature at point of application. Verify temperature of asphalt as specified herein before.
    7. Apply vapour retarder sheet at rate of 1.2 kg/m2 (25 lbs/sq) per mopping.
    8. Apply felts at rate of 1.2 kg/m2 (25 lbs/sq) per mopping.
    9. For glass felts apply asphalt at rate of 1.5 kg/m2 (28 lbs/sq) per mopping.
    10. Apply insulation at rate of 1.2 kg/m² (25 lbs/sq) per mopping.
    11. Apply aggregate at rate of 3 kg/m² per gravel coat, but at not less than 3 mm (1/8") thickness at any location on surface, before gravel is placed.
    12. For slopes up to 0.06:1 use Type 1 bitumen.
    13. For glass use Type 2 Bitumen or Type 3 only.

14. For slopes from 0.06:1 to 0.125:1 use Type 2 bitumen.
15. For slopes over 0.125:1, and at vertical surfaces, use Type 3 bitumen.

19. Control Joints:

    1. At locations indicated on Drawings, install membrane control joints.
    2. Construct control joints by cutting through finished roofing felts along entire length of joint. Lay a 100 mm x 100 mm (4" x 4") fibre cant over cut joint and apply bituminous flashings to each side but not carried over. Then, before aggregate is applied, adhere a 500 mm (20") wide continuous strip of butyl membrane over entire joint as recommended by membrane manufacturer.
    3. At joint between butyl membrane, prime surfaces, apply adhesive and form joint as recommended by membrane manufacturer.

20. Bituminous Membrane Application:

    1. Ensure membrane substrate is rigid, dry, smooth, compatible, free of fins and sharp edges, and clean of debris and foreign matter and that no moisture is present on substrate at time of application of membrane.
    2. Start roofing application at lowest point of roof (edge or drain) to ensure water flows over laps of membrane. Proceed up slope at right angles to direction of flow.
    3. Conform to CRCA recommended practice. Apply full mopping of hot asphalt to fibreboard. Apply 4 plies of felt, lapping each sheet 685 mm (27") over preceding sheet and mopping full width of each sheet with 1.2 kg/m^2 (25 lb/100 sq ft) of asphalt. Lap end joints minimum of 150 mm (6"). Carry plies to top of cants.
    4. Embed first ply of felt in full mopping of bitumen.
    5. Laminate succeeding plies with full moppings of bitumen over entire surface of each ply, including laps. Lap end joints a minimum of 150 mm (6").
    6. Spread bitumen uniformly and immediately lay felts. Cover surfaces completely to prevent bare felt touching bare felt.
    7. On slopes of 1:12 and over. Backnail each sheet 50 mm (2") from top edge at 600 mm (24") oc.
    8. In roof valleys, lay 1 extra ply of felt 2 roll widths wide, lapped 300 mm (12") in full mopping of bitumen, including laps. Lay another ply 1 roll width, to form valley saddles continuous along and centred on low points of roof surface.

21. Modified Bituminous Base Flashing Application:

    1. Apply base sheet flashing over dried and cured primer coat.
    2. Pre-cut flashing in strips 1 m (39") wide to correct length to extend minimum 100 mm (4") onto field of roof, up vertical surface and over any fascia minimum 50 mm (2"). Ensure side laps are 75 mm (3") and staggered minimum of 100 mm (4") with laps of base sheet. Dry fit pieces to proper size.
    3. Provide base flashing reinforcements at stress points of roof, at inside and outside corners, vents, drains and mechanical units. Install as detailed on Drawings or follow membrane manufacturer's recommendations.
    4. Provide base flashings at roof protrusions (vents pipes, roof drains and mechanical equipment curbs). Install as detailed on Drawings.
    5. Torch apply base sheet flashing directly on its support from bottom to top. Ensure torch welding softens under side of base sheet without overheating, resulting in uniform adhesion over entire surface. Take precaution not to stretch membrane. When allowed by support, nail top edge of base sheet flashing 300 mm (12") oc.

22. Modified Bituminous Cap Sheet Flashings Application:

    1. Pre-cut flashing in strips 1 m (39") wide to correct length to extend minimum 150 mm (6") onto field of roof, up vertical surface and over any fascia minimum 50 mm (2"). Ensure side laps are 75 mm (3") and staggered minimum of 100 mm (4") with laps of base sheet. Dry fit pieces to proper size.
    2. Lay cap sheet flashing in strips 1 m (39") wide to vertical surfaces, extending on to flat surface of roof minimum of 150 mm (6"). Ensure side laps are 75 mm (3") and staggered minimum of 100 mm (4")

with laps of cap sheet.

3. Using chalk line, lay out straight line on cap sheet surface, parallel to roof edge, 150 mm (6") inside roof from parapet wall.
4. Soften bitumen by heating mineral surface with torch. When granules start to sink into bitumen, stop torching with hot round nosed trowel, embed granules in bitumen from chalk line to edge of cap sheet.
5. Torch apply cap sheet completely covering base sheet, lapping all edges to selvage. Ensure torch welding softens under side of base sheet without overheating, resulting in uniform adhesion over entire surface. Press in firmly for proper adhesion. Continue by bonding upper portion to wall, taking precautions not to stretch membrane.
6. Anchor with tin capped nails or roofing nails and disks or membrane manufacturer's recommended fasteners placed at top of flashing and driven into wood backing.
7. Ensure flow out bead is present along lap edges. Avoid excessive asphalt seepage. Maximum seepage allowed is 6 mm (1/4").
8. Take great care to ensure asphalt does not spread out over exposed part of cap sheet flashing.
9. Ensure factory provided granules are applied to overflow bitumen at lap before bitumen cools to provide clean appearance.

3.4 SITE QUALITY CONTROL

1. Site Tests and Inspections:

    1. Consultant may appoint an independent roofing inspection company.

    2. If so required by inspection company, or by Consultant, make any cut tests required. This Subcontractor to pay costs of such tests and making good afterwards to roofing.

    3. Owner may engage independent inspection company to inspect work of this Section. Give at least 2 weeks notice of starting work and allow inspector free access. Inspection may include thermographic survey of completed roof.

    4. Inspection - Roof Levels:
        1. Before roofing commences, inspect and check roof surfaces for levels.
        2. Undertake a series of spot level checks to determine if there is any unevenness in roof decks which may result in pools of water being left on complete roofing in excess of 13 mm (1/2") depth.
        3. Ensure deck has been inspected and approved by Consultant prior to start of roofing work.

2. Manufacturer Services: Ensure to arrange for membrane manufacturer representative's site visit on Day roofing is commenced and periodically thereafter, to ensure work is properly performed. Upon completion of work of this Section, ensure manufacturer's representative inspects roof and verifies quality of work to yield weathertight waterproofing roofing system and issue manufacturer's warranty. Ensure Manufacturer's representative informs Consultant, Contractor and Subcontractor executing work of this Section promptly in writing when inspection is complete and provide detailed report.

3.5 CLEANING

1. Waste Management: Discard and legally dispose components that cannot be applied within its stated shelf life to requirements of authorities having jurisdiction.

3.6 PROTECTION

1. Protect work of this Section from damage. Replace damaged work which cannot be satisfactorily repaired, restored or cleaned at no cost to Owner.

2. Provide protection covering out of 13 mm (1/2") thick plywood underlaid with 25 mm (1") thick polystyrene insulation board adhered to it, over roofed areas when working from, or over, such roof surfaces. Provide such protection below hoist rigs, ladders, pallets of material, and in other circumstances where the roofing membrane is exposed to potential damage. Secure protection boards

mechanically against windstorm loss.

3. Protect finished wall and roof surfaces against damage of any kind. Protect finished sheet metal work and membrane flashing against punctures and damage of any kind. Be responsible for damage sustained by work of this trade. Do not use equipment over the roofing materials which would cause damage to the materials in any way.

4. Protect surrounding work, and adjacent building and other property from damage during roofing operations, taking particular care to prevent bitumen droppings and discolouration of surrounding buildings by smoke from kettles. Locate kettles to prevent smoke entering adjacent and Project buildings.

5. Use protection covering specified in work areas and along work routes as required to prevent damage to steel deck or sheathing and roofing.

6. Protect completed portions of roof from damage.
7. At conclusion of each Day's work, seal exposed edges of roof insulation. Remove when resuming work. Remove used bitumen mops to ground level.

8. Do not torch over or near flammable substrates such as fibreboard.

9. Fire Protection:

    1. Respect safety measures described in manufacturer's literature as well as local jurisdictional authorities.
    2. Have a 9 kg (20 lb) dry chemical fire extinguisher acceptable to authorities having jurisdiction, fully charged and in operable condition at all locations where open flames are used.
    3. During roofing maintain a clean site and keep 2 foam or dry type fire extinguishers on roof within easy access of torching application and in any open flame location while roofing is in progress.
    4. Verify no vent pipes venting flammable fumes (i.e. fuel storage tanks) are in area of work.
    5. Do not have gasoline or other flammable solvents on roof while torching.
    6. Be vigilant against self-starting fires at end of roofing operations cease for Day. Use a heat detector gun to spot any smouldering or concealed fire. Examine roof for hot spots 1 hour after completion of roofing operations, especially at flashings and around roof penetrations.

End of Section 07 51 13

1 GENERAL

1.1 GENERAL INSTRUCTIONS

1. Read and conform to:
    1. CCDC 2 - 2008, Stipulated Price Contract as amended in the Contract Documents.
    2. Division 1 requirements and documents referred to therein.

1.2 SUMMARY

1. Section Includes: Provide modified bituminous membrane roofing including but not limited to following:
    1. cleaning deck surface.
    2. roof sheathing.
    3. vapour retarder.
    4. roof insulation.
    5. roof membrane and flashings (mopped/torched).
    6. roof accessories.
    7. roof walkways.
2. Related Sections: Following description of work is included for reference only and shall not be presumed complete:
    1. Reglets, through wall flashings and air/vapour barrier installation: Section 04 20 00, Masonry Units.
    2. Provision of wood blocking: Section 06 10 00, Rough Carpentry.
    3. Provision of tongue and groove wood decking: Section 06 15 00, Wood Decking.
    4. Supply of miscellaneous air/vapour barriers to complete continuity of air/vapour barrier integrity: Section 07 25 00, Miscellaneous Air/Vapour Barriers.
    5. Supply of prepainted flashings: Section 07 62 00, Sheet Metal Flashing and Trim.
    6. Sealants except for sealant required for roof flashings: Section 07 92 00, Joint Sealants.
    7. Supply and installation of roof drains: Division 22, Plumbing.
    8. Vent pipes and connection of vent pipes: Division 22, Plumbing.
    9. Prefabricated curbs for mechanical equipment on roof and counter flashings for ducts passing through roof: Division 23, Heating, Ventilating and Air Conditioning.

1.3 REFERENCES

1. Abbreviations and Acronyms:
    1. CRCA: Canadian Roofing Contractors' Association; www.roofingcanada.com.
    2. EVT: Equiviscous Temperature.
    3. FBT: Finish Blowing Temperature.
    4. FM: Factory Mutual Global; www.fmglobal.com.
    5. FP: Flash Point.
    6. LTTR: Long Term Thermal Resistance.
    7. OBC: Ontario Building Code.
    8. OIRCA: Ontario Industrial Roofing Contractors' Association; www.ontarioroofing.com.
    9. SBS: Styrene-butadiene-styrene.
    10. ULC: Underwriters Laboratories of Canada; www.ulc.ca.
2. Definitions: Conform to ASTM D1079 for glossary of terms and definitions of roofing terminology.
3. Reference Standards:

1. ASTM C509-06(11) - Standard Specification for Elastomeric Cellular Preformed Gasket and Sealing Material
2. ASTM C920-14a - Standard Specification for Elastomeric Joint Sealants
3. ASTM C1177/C1177M-13 - Standard Specification for Glass Mat Gypsum Substrate for Use as Sheathing
4. ASTM C1278/C1278-07a(11) - Standard Specification for Fiber-Reinforced Gypsum Panel
5. ASTM C1325-14 - Standard Specification for Non-Asbestos Fiber-Mat Reinforced Cementitious Backer Units
6. ASTM D92-12b - Standard Test Method for Flash and Fire Points by Cleveland Open Cup Tester
7. ASTM D312-00(06) - Standard Specification for Asphalt Used in Roofing
8. ASTM D1079-13e1 - Standard Terminology Relating to Roofing and Waterproofing
9. ASTM D1622/D1622M-14 - Standard Test Method for Apparent Density of Rigid Cellular Plastics
10. ASTM D1623-09 - Standard Test Method for Tensile and Tensile Adhesion Properties of Rigid Cellular Plastics
11. ASTM D3273-12 - Standard Test Method for Resistance to Growth of Mold on the Surface of Interior Coatings in an Environmental Chamber
12. ASTM D4263-83(12) - Standard Test Method for Indicating Moisture in Concrete by the Plastic Sheet Method
13. ASTM E84-14 - Standard Test Method for Surface Burning Characteristics of Building Materials
14. ASTM E136-12 - Standard Test Method for Behavior of Materials in a Vertical Tube Furnace at 750°C
15. CGSB 37-GP-9Ma - Primer, Asphalt, Unfilled for Asphalt Roofing, Dampproofing and Waterproofing
16. CGSB 37-GP-56M - Membrane, Modified Bituminous, Prefabricated and Reinforced for Roofing
17. CSA A123.3-05(10) - Asphalt Saturated Organic Roofing Felt
18. CAN/CSA-A123.4-04(13) - Asphalt Use in Construction of Built-Up Roof Coverings and
19. Dampproofing Systems
20. CSA A231.2-14 - Precast Concrete Pavers
21. CSA B111-74(03) - Wire Nails, Spikes and Staples
22. CAN/ULC-S102-10 - Standard Method of Test for Surface Burning Characteristics of Building Materials and Assemblies
23. CAN/ULC-S107-10 - Methods of Fire Tests of Roof Coverings
24. CAN/ULC-S114-05 - Standard Method of Test for Determination of Non-Combustibility in Building Materials
25. CAN/ULC-S126-06 - Standard Method of Test for Fire Spread under Roof-Deck Assemblies
26. CAN/ULC-S701-11 - Standard for Thermal Insulation, Polystyrene, Boards and Pipe Covering
27. CAN/ULC-S702-09 - Standard for Mineral Fibre Thermal Insulation for Buildings
28. CAN/ULC-S704-11 - Standard for Thermal Insulation, Polyurethane and Polyisocyanurate, Boards, Faced
29. CAN/ULC-S770-09 - Standard Test Method for Determination of Long-Term Thermal Resistance of Closed-Cell Thermal Insulating Foams
30. UL 1256 - Standard for Fire Test of Roof Deck Construction

1.4 ADMINISTRATIVE REQUIREMENTS

1. Preinstallation Meetings:

    1. Arrange preinstallation meeting 1 week before commencing work with all parties associated with trade as designated in Contract Documents or as requested by Consultant. Presided over by Contractor, include Consultant who may attend, Subcontractor performing work of this trade, Owner's representative, testing company's representative and consultants of applicable discipline. Review Contract Documents for work included under this trade and determine complete

understanding of requirements and responsibilities relative to work included, storage and handling of materials, materials to be used, installation of materials, sequence and quality control, Project staffing, restrictions on areas of work and other matters affecting construction, to permit compliance with intent of work of this Section.

2. Review installation procedures and coordination required with related work including roofing requirements for interfacing with roof accessories and roof mounted equipment.

3. Review fire hazard assessment of work prior to commencement of torch application.

4. Review methods and procedures related to roofing installation, including manufacturer's written instructions.

5. Review and finalize construction schedule and verify availability of materials, installer's personnel, equipment and facilities needed to make progress and avoid delays.

6. Examine deck substrate conditions and finishes for compliance with requirements, including flatness and fastening.

7. Review structural loading limitations of roof deck during roofing.

8. Review base flashings, special roofing details, roof drainage, roof penetrations, equipment curbs and condition of other construction that will affect roofing system.

9. Review temporary protection requirements for roofing system during and after installation.

10. Review roof observation and repair procedures after roofing installation.

2. Scheduling:

1. Co-operate fully with other Subcontractors on the Work and promptly proceed with this work as rapidly as job conditions permit.

2. Supply items to be built in, in ample time to be incorporated into work of other Subcontractors as it is carried up. Proceed with insulation, roofing and flashing work as soon as walls and roof decks are ready to receive same.

1.5 SUBMITTALS

1. Product Data: Submit Product data on membrane, bitumen and flashing materials.

2. Shop Drawings:

1. Submit Shop Drawings in accordance with Section 01 30 00 showing method of installation and layout of each layer, fastening and flashings at edges, flashing of protrusions and penetrations, connection to air barrier in wall, details of insulation, tapered insulation layouts and vapour retarder and securement details of sheathing.

2. Ensure Shop Drawings have been reviewed and accepted by membrane manufacturer. Provide written confirmation on membrane manufacturer's letterhead.

3. Samples: Submit samples in accordance with Section 01 30 00. Submit following samples in sizes indicated:

1. insulation: 300 mm x 300 mm (12" x 12") square.
2. base sheet roofing membrane: 300 mm x 300 mm (12" x 12") square.
3. cap sheet roofing membrane: 300 mm x 300 mm (12" x 12") square.
4. Test and Evaluation Reports:

5. If requested, provide Product test reports based on evaluation of comprehensive test performed by manufacturer and witnessed by a qualified independent testing agency for components of roofing system.
6. Indicate components of roofing system comply with requirements of these Specifications including quantity, statistical and descriptive data for each Product and other data pertaining to date, time and temperature for each load of bulk asphalt.

1.6 CLOSEOUT SUBMITTALS

1. Operation and Maintenance Data:

    1. Supply necessary maintenance data and repair instructions for binding into maintenance manuals described in Section 01 70 00.

    2. Bind into each maintenance manual, Project name, location, dated and executed copy of manufacturer's guaranty, described herein and name, address and phone number of nearest manufacturer's representative. Include recommendations for periodic inspections, care and maintenance. Identify common causes of damage with instructions for temporary patching until permanent repair can be made.

1.7 QUALITY ASSURANCE

1. Qualifications:

    1. Manufacturers: Company specializing in manufacturing Products specified in this Section with minimum 10 years successful experience.

    2. Installers: Provide work of this Section executed by competent installers fully conversant with standards, methods and techniques required, with minimum of 5 years experience in application of Products, systems and assemblies specified and with approval and training of Product manufacturers. Ensure roofer is qualified and approved by membrane manufacturer and is a member in good standing in CRCA.

2. Conform to CRCA's "CRCA Roofing Specifications Manual – 2011", except where indicated or specified otherwise.

3. Do roofing work employing roofing Products, roof sheathing, plates and fasteners recommended by FM data for wind uplift requirements.

4. More stringent requirements in Consultant's opinion governs.

1.8 DELIVERY, STORAGE AND HANDLING

1. Delivery and Acceptance Requirements: Deliver materials in dry location, in original containers with manufacturer's wrappers and seals intact. Carefully unload to prevent damage thereto.

2. Storage and Handling Requirements:

    1. Store materials in dry location, in original containers with manufacturer's wrappers and seals intact. Carefully place in temporary storage in a manner to prevent damage thereto.

    2. Keep membrane materials dry, stored in rolls standing on end, selvage edge up, elevated from contact with moisture, at temperatures not less than 5 deg C (41 deg F) or more than 49 deg C (120 deg F) and pre-conditioned before installation. Handle rolls with care to avoid crushing, puncturing or other damage. Ensure selvage edge is not damaged during handling and banding strips are removed before application of membrane. Do not use wet or damp membrane.

    3. Do not expose insulation and roof sheathing to wet weather. Store and handle insulation to prevent

broken edges and corners, punctures, indentations or other damage. Remove damaged insulation from site.

4. Ensure bitumen delivered in form of cartons has manufacturer's materials identification labels intact on each carton; if in form of bulk tanker delivery, ensure each shipment is accompanied by written certificate from manufacturer confirming material identification including following:

    1. Softening Point as per ASTM D312 or CAN/CSA-A123.4.
    2. Minimum FP per ASTM D92.
    3. EVT.
    4. FBT.

5. Do not intermix different types or grades of bitumen in bulk shipments.

6. Protect sheet metal materials from bending and scratching.

7. Store adhesive, emulsion based waterproofing mastics, sealants and primers between 15 deg C and 26 deg C (59 deg F and 79 deg F), or restore to temperature ranges before use.

8. Store materials at site within temporary sheds or trailers; such facilities must be well sealed and kept at least 3 deg C (5 deg F) warmer than exterior ambient temperature to ensure materials remain dry in terms of roofing. Do not use wet, damp, frozen or damaged materials. Stack rolls of felt on end.

9. Do not store more than 1 Day's supply of materials on roof at any time. On roof, stack materials on pallets, and completely cover with incombustible waterproof tarpaulin whenever work is interrupted, or when there is precipitation of any kind. Securely tie covering to pallets in such way as to be weather tight. Plastic covers and shrinkwrap covers by manufacturers are not acceptable for site storage and be removed upon delivery to roof.

10. Distribute materials stored on roof to stay within designated live load limits of roof construction. Provide ample bases under equipment and materials to distribute weight to conform to these live-load limits. Do not store materials on, or transport materials across, completed roof areas.

11. Store combustible materials away from heat and open flames. Protect and store materials in dry, ventilated area away from welding flame, spark and from elements or harmful substance.

12. Do not lift rigid insulation in slings which will damage edges. Remove damaged insulation and replace with new material at no cost to Owner.

1.9 SITE CONDITIONS

1. Ambient Conditions:

    1. Do not apply any part of roofing system over damp materials, or during a period of damp weather.

    2. Apply roofing only when air and surface temperatures are acceptable to manufacturer for application of their Product.

1.10 WARRANTY

1. Manufacturer Warranty:

    1. Warrant work of this Section using manufacturer's standard form of warranty for a period of 15 years against defects and/or deficiencies (total membrane system warranty; labour, material and workmanship) in accordance with General Conditions of the Contract. Promptly correct any defects or deficiencies resulting in water leakage within warranty period and render roofing membrane to a watertight condition to satisfaction of Consultant and at no expense to Owner.

2. In addition to above, provide to Owner a written warranty covering defects of workmanship for a period of 2 years commencing from date of Substantial Performance of the Work and agree to Make Good promptly any defects which occur or become apparent within warranty period in conjunction with membrane manufacturer's warranty. Ensure warranty is on either CRCA's or OIRCA's "Standard Form of Warranty".

2 PRODUCTS

2.1 MANUFACTURERS

1. Manufacturer List: Products of following manufacturers are acceptable subject to conformance to requirements of Drawings, Schedules and Specifications:
    1. Atlas Roofing Corporation; www.atlasroofing.com
    2. Bakor Inc.; www.bakor.com
    3. CGC Inc.; www.cgcinc.com
    4. Firestone Building Products Company; www.firestonebpco.ca
    5. GAF Materials Corporation; www.gaf.com
    6. Georgia-Pacific Canada, Inc.; www.gpgypsum.com
    7. Hunter; www.hunterpanels.com
    8. IKO Industries Ltd.; www.iko.com
    9. Soprema Inc.; www.soprema.ca
    10. Tremco; www.tremcoroofing.com
2. Substitution Limitations: This Specification is based on Soprema's, mopped/torched system with perimeter base sheet membrane and flashings being installed first. Comparable systems from manufacturers listed herein will be accepted provided they meet requirements of this Specification.

2.2 MATERIALS

1. Description:
    1. Regulatory Requirements:
        1. Fire Hazard Classification: ULC Class C. Ensure complete roof meets ULC requirements for Class C, as applicable roof and other authorities having jurisdiction.
        2. Roof Type 2 (R2): Provide fully bonded 2 ply SBS modified bituminous membrane roofing work at canopies, including but not limited to following:
            1. Steel deck (by others).
            2. Plywood roof sheathing (by others).
            3. perimeter base sheet membrane mopped-in asphalt.
            4. base sheet membrane mopped-in asphalt.
            5. cap sheet membrane torched-on.
            6. self adhesive base and torched-on cap sheet flashings.
2. General: Ensure materials are compatible and satisfactory to membrane manufacturer. Ensure sheet

membrane materials are manufactured by 1 manufacturer and comply as a minimum with requirements of local jurisdictional authorities. Select appropriate type of insulation on basis of its total compatibility when incorporated into roofing system, including that of substrate, required thermal value as well as their ability to adhere components permanently and in a rigid manner in finished roofing system.

3. Fasteners:

    1. Factory-coated steel fasteners and metal or plastic plates designed for fastening roofing membrane components to substrate; tested by manufacturer for required pullout strength; and acceptable to roofing system manufacturer. Ensure fasteners engage in steel deck a minimum of 19 mm (3/4").

    2. "Premium No 12, UltraFast" hexagonal head fastener coated for corrosion resistance complete with locking plastic plates or galvalume metal plates, "Lexgrip Fasteners" or "Lexgrip Striker Anchors" complete with stress plate by Lexcan Ltd.

    3. Screws: Zinc and dichromate plated.

    4. Nails: Non-ferrous or galvanized steel, flat head, barbed roofing nails, CSA B111, Table 12, size and type to suit application.

    5. Metal Plates: 75 mm x 75 mm (3" x 3") with stiffening ribs as recommended by manufacturer.

    6. Metal Discs: Flat caps of 25 mm (1") minimum diameter, 0.759 mm (22 ga) minimum sheet metal, formed to prevent dishing. No discs are required with roofing nails having 25 mm (1") diameter solid cap heads.

4. Joint Tape: Asphalt treated kraft paper, fibre reinforced, 100 mm to 150 mm (4" to 6") wide, self adhering.

5. Asphalt Primer: To CGSB 37-GP-9Ma as recommended by membrane manufacturer.

6. Asphalt: CAN/CSA-A123.4; Type I for slopes up to 1:16, Type II for slopes up to 1:8 or Type III for slopes more than 1:16.

7. Perimeter Roofing Base Sheet Membrane:

    1. CGSB 37-GP-56M, Type 2 for covered roofing application, sanded on both surfaces, Grade 2 Heavy duty service.
    2. Heavy duty SBS modified bitumen perimeter membrane composed of a composite reinforcement (non-woven polyester and glass grid reinforcement weighing minimum 160 g/m2), lightly sanded top and underface with both edges of perimeter base membrane having a 200 mm (8") selvedge protected by a silicone-coated release film. Ensure membrane is minimum
    3. 2.2 mm (0.078") thick.

8. Field Roofing Base Sheet Membrane:

    1. CGSB 37-GP-56M, Type 2 for covered roofing application, Class P, Plain Surfaced, Grade 2 Heavy duty service.
    2. Ensure roofing base sheet membrane have non-woven fibrous glass reinforcement and thermofusible elastomeric asphalt. Protect top face with a thermofusible plastic film and lightly sanded underface. Ensure membrane is minimum 2.2 mm (0.078") thick.

9. Flashing Base Sheet Membrane and Gussets:

    1. CGSB 37-GP-56M, Type 2, Class P, Plain Surfaced, Grade 2 Heavy duty service.
    2. Flashing base sheet membrane having a non-woven polyester and glass grid reinforcement (130 -

140 g/m2) and SBS modified bitumen. Top face protected by a thermofusible plastic film and self adhesive underface covered by silicone release plastic film. Ensure membrane is minimum 3 mm (1/8") thick.
3. Summer grade for application at temperature above 10 deg C (50 deg F) and winter grade for application between -10 deg C (14 deg F) and 10 deg C (50 deg F).

10. Flashing Base Sheet Membrane and Gussets (Composite Reinforced):

    1. CGSB 37-GP-56M, Type 2, Class P, Plain Surfaced, Grade 2 Heavy duty service.
    2. Heavy duty SBS modified bitumen membrane composed of a composite reinforcement (non-woven polyester and glass grid reinforcement weighting minimum 160 g/m2); top face covered with thermofusible plastic film, underface covered by silicone release plastic film. Ensure membrane is minimum 3.0 mm (0.125") thick.
    3. Summer grade for application at temperature above 10 deg C (50 deg F) and winter grade for application between -10 deg C (14 deg F) and 10 deg C (50 deg F).

11. Primer: Primer to enhance adhesion of self adhesive membranes on porous surfaces compatible with self adhesive under face as recommended by flashing base sheet manufacturer.

12. Roofing and Flashing Cap Sheet Membrane:

    1. CGSB 37-GP-56M, Type 1, for exposed roofing application; Class G, Granule surfaced; Grade 2 Heavy duty service.
    2. Ensure roofing and flashing cap sheet membrane have non-woven polyester reinforcement 250 g/m2 and thermofusible elastomeric asphalt. Ensure top face is self protected with coloured ceramic granules and under face is protected by thermofusible plastic film. Ensure membrane is minimum 3.5 mm (0.138") thick and be applied by torching only.
    3. Ensure colour of ceramic granules on cap sheet are selected by Consultant from manufacturer's standard range.

13. Primer: Primer to enhance adhesion of self adhesive membranes on porous surfaces compatible with self adhesive under face as recommended by flashing base sheet manufacturer.

14. Roofing and Flashing Cap Sheet Membrane:

    .1 CGSB 37-GP-56M, Type 1, for exposed roofing application; Class G, Granule surfaced; Grade 2 Heavy duty service.
    .2 Roofing and flashing cap sheet membrane having non-woven polyester and glass grid reinforcement (130 -140 g/m2) and SBS modified bitumen. Ensure top face is self protected with coloured ceramic granules and under face is protected by silicone release plastic film. Ensure membrane is minimum 3.8 mm (148 mils) thick.

15. Loose Granules: Matching granules of roofing cap sheet membrane for covering bitumen bleed out at same rate granular surface cap sheet 1 kg (2.2 lb) per 25 rolls.

16. Roof Penetration Sealing System: Roof penetrations sealing system composed of precast modular polyester curbs, polyester adhesive and 1-part moisture-cure, self-levelling, pourable sealer; "ChemCurb System" by Chem Link Inc., www.chemlinkinc.com, "Inter Clip System" by Soprema Inc. or "FillGard M" by Firestone Building Products Company.

17. Joint backing: To be continuous, extruded, polyolefin foam, consisting of non-absorbing outer skin and highly resistant interior, non-gassing, cellular network of open and closed cells, sized 25% greater than joint width. Density: 2.0 lb/cu ft (ASTM D1622/D1622M) Tensile strength: 25 psi (ASTM D1623) - Water absorption: 0.5% by volume (ASTM C509) - Deflection at 50% compression: 3 psi Recovery at 50%: 95% - Out-gassing: None - Temperature range: -45 deg F to 225 deg F.

18. Sealant: Non-sag type, 1 component polyurethane sealant conforming to ASTM C920, Type S, Grade NS, Class 25, Use NT, G, M, A and O. Supply in standard colours as selected.

19. Bituminous Paint: Heavy bodied, emulsion type paint which protects against electrolytic action on metals; recommended by installer and accepted by Consultant.

20. Plastic Roofing Cement: As recommended by roofing membrane manufacturer.

3 EXECUTION

3.1 EXAMINATION

1. Verification of Conditions:

    1. Report any defects or irregularities in roof deck detrimental to roof application. Do not proceed until corrected.

    2. Check deck is properly installed with required slopes to attain positive drainage and drains are connected.

    3. Ensure openings, walls and projections through deck are completed and affixed and reglets and nailing strips are in place prior to membrane installation. Cooperate with mechanical and/or electrical Divisions as necessary.

    4. Ensure deck substrate scheduled to receive roof system is smooth, dry, clean and free of sharp projections.

2. Evaluation and Assessment: Commencement of work implies acceptance of previously completed work.

3.2 PREPARATION

1. Protection of In-Place Conditions:

    1. Protect walls where hoisting is necessary. Locate kettles so smoke and fumes will not discolour building or adjacent buildings or become a nuisance to adjacent Owners or the public.

    2. Temporarily block drain pipes during application of roofing membrane. Remove blocking each night or when Work is not in progress and after Work of this Section is completed.

2. Surface Preparation:

    1. Immediately before any roofing materials are applied, clean decks of roughness, rubbish, dust, dirt, oil, grease, snow and ice perfectly clean and dry. Remove ice and snow and dry decks. Do not use salt or calcium to remove snow or ice.

    2. Do no roofing work during rain, fog, sleet or snow, or upon surfaces covered with dust, water, dew, ice, frost, snow and similar detrimental conditions.

    3. Ensure sleeves, anchors and other items to be secured to or pass through roof surfaces are installed. Verify that units and curbs are properly secured in place.

3.3 INSTALLATION

1. Cold Weather Application:

    1. Remove moisture from substrate before application of membrane.
    2. Follow daily weather forecasts to determine commencement of work or to anticipate possible suspension.
    3. At temperatures below 10 deg C (50 deg F), store membrane material in warm and dry storage until

ready to use. Bring out to work area only enough rolls for immediate use. Reheat membrane underside by sweeping torch over entire width of roll for softening membrane.

2. Roof Sheathing on Wood Deck:

    1. Place roof sheathing with end joints staggered. Butt boards together to moderate contact.
    2. Hold roof sheathing in-place as required by site conditions until covered by complete roof system.
    3. Mechanically fasten roof sheathing within a 1200 mm (4') margin around perimeter of roof deck. Use approved mechanical fasteners and plates at rate and pattern recommended by manufacturers. Provide minimum 4 screws per board.
    4. Tape joints in roof sheathing.
    5. Temporarily cover roof sheathing not covered by membrane at the end of each Day's Work with polyethylene film.

3. Membrane:

    1. Unroll membrane and allow roll to relax in sunlight for 30 to 45 minutes before application. Reroll from both ends and apply in both directions.

    2. Mopping temperatures of asphalt are critical (minimum 220 deg C (428 deg F)) and unrolling of membrane must be done immediately. Limit mop strokes to 1200 mm (48") ahead of roll.

    3. Before starting mop stroke, pull roll tightly against cooled asphalt, so to eliminate any air pockets or voids that may have occurred during previous mop stroke.

    4. Use only roofing equipment approved by manufacturer of roofing membrane system. Install roofing membrane and membrane flashings in accordance with manufacturer's printed directions.

    5. Apply roofing as soon as possible after roof deck is finished and to meet Project construction schedule.

    6. Adjustments to specified roofing procedures caused by weather and site conditions are subject to Consultant's acceptance.

    7. Maintain equipment in good working order to ensure control of roofing operations and protection of work.

    8. Ensure each part of roofing system is completely bonded to other unless otherwise specified.

    9. Anchor roofing to meet requirements of Underwriter and jurisdictional authorities, minimum 1200 mm (4') around perimeter.

    10. Lay roofing plies free from wrinkles, air pockets, fishmouths, tears and prominent lap joints. Embed them in a uniformly spread layer of bitumen.

    11. Extend roofing sheets to outer edges of roof and up vertical surfaces.

4. Bitumen Application:

    1. Locate kettles near roofing operation.

    2. Maintain constant supervision of kettles to ensure bitumen is not overheated. Check temperature of bitumen in kettle every 10 to 15 minutes with an accurate thermometer constantly available at, but not attached to each kettle. Do not use bitumen which is outside of specified temperature range. Dispose, away from Place of the Work, bitumen heated in excess of highest temperature recommended for its type by manufacturer and that is either on roof or at kettle.

    3. Heat asphalt to ensure optimum viscosity for applicator but to no higher temperature than

recommended by manufacturer. Do not heat asphalt to or above 260 deg C (500 deg F). Maintain EVT at pour.

4. Do not apply at temperature lower than EVT. Restrain asphalt temperature at point of application to EVT +/-15 deg C (25 deg F).

5. Do not heat and hold asphalt above FBT for more than 4 hours.

6. Use heating kettles equipped with thermometers which continually show temperature of asphalt. Equip foreman with portable stem thermometer for checking temperature at point of application.

7. Apply vapour retarder sheet at rate of 1.2 kg/m2 (25 lbs/sq) per mopping.

8. Apply felts at rate of 1.2 kg/m2 (25 lbs/sq) per mopping.

9. For glass felts apply asphalt at rate of 1.5 kg/m2 (30.7 lbs/sq) per mopping.

10. Apply insulation at rate of 1.2 kg/m² (25 lbs/sq) per mopping.

11. For slopes up to 0.06:1 use Type I bitumen.

12. For glass use Type II bitumen or Type III only.

13. For slopes from 0.06:1 to 0.125:1 use Type II bitumen.

14. For slopes over 0.125:1 and at vertical surfaces, use Type III bitumen.

5. Perimeter Roofing Base Sheet Membrane:

    1. Where recommended by manufacturer install perimeter roofing base sheet specified herein or install base sheet membrane field application as specified herein, immediately followed by installation of adhesive and/or mechanically fastened sheet flashing system specified herein.

    2. Ensure membrane substrate is rigid, dry, smooth, compatible, free of fins and sharp edges and clean of debris and foreign matter and no moisture is present on substrate at time of application of membrane.

    3. Install perimeter roofing base sheet membrane before field base sheet membrane. Position this membrane parallel to upstands and mop in-place using specified procedures. Position and unroll perimeter base sheet membrane to achieve correct overlap and alignment with roof line.

    4. Mop hot asphalt at rate of 1 kg/m2 to 1.5 kg/m2 (0.2 lbs/sq ft to 0.3 lbs/sq ft), not more than 1000 mm (3') ahead of roll.

    5. Press perimeter base sheet membrane into hot mopped asphalt. Lay perimeter base sheet with 75 mm (3") side laps and 150 mm (6") end laps. Seal overlaps using heat gun and trowel adjacent to upstands and torch and trowel elsewhere before end of Working Day. Do not push roll, always unroll evenly. After installation of base sheet, bitumen must be cooled before walking on membrane.

    6. Ensure modified bitumen surface protected by silicone-coated release film is ready to receive flashing base membrane.

    7. Ensure flow out bead is present at all locations along lap edges. Avoid excessive asphalt seepage. Maximum seepage allowed is 6 mm (1/4").

6. Self Adhesive/Torched Sheet Flashing System:

1. Provide flame guard self adhesive tape at openings and junctions which may expose combustible substrates prior to torching.
2. Apply primer at a rate recommended by base sheet flashing membrane manufacturer over substrate free of rust, dust or any residue that may hinder adherence. Apply base sheet flashing membrane over dried and cured primer coat.
3. Starting at slope bottom, unroll each roll dry. Do not immediately remove protective film of paper. Let stand for a few minutes before re-rolling. Once aligned, re-roll 1 end towards centre.
4. Using sharp blade, cut through surface of protective film without cutting membrane. Remove small length of protective film and unroll exposed membrane for initial adherence. Continue removing protective film and advance roll. Ensure surface remains smooth. Avoid wrinkling or warping.
5. Align roll properly. If roll is not properly aligned, do not push to 1 side or another. Instead, cut roll and realign properly. Overlap adjacent rolls 50 mm (2") by removing protective film from top face of side laps.
6. Do not remove protective paper film before installation to avoid accumulation of any debris on exposed roll.
7. Overlap end joints 50 mm (2"). Stagger end laps at least 300 mm (12").
8. Provide gusset reinforcing at stress points of roof, inside and outside corners, vents and mechanical units. Apply self adhesive gusset at every inside and outside corners before installing base sheet flashing membrane. Install in accordance with manufacturer's recommendations so completed installation ensures any combustible substrates are protected from torching cap sheet.

7. Field Base Sheet Membrane:

    1. Ensure membrane substrate is rigid, dry, smooth, compatible, free of fins and sharp edges, and clean of debris and foreign matter and no moisture is present on substrate at time of application of membrane.

    2. Provide flame guard self adhesive tape at openings and at junction which may expose combustible substrates prior to torching. Remove release paper from back of membrane tape and install in continuous lengths. Overlap ends a minimum of 50 mm (2"). For angle changes fold in half and apply half of its width to horizontal surface and half of its width to vertical surface. Centre tap over cracks and voids.

    3. Start roofing application at lowest point of roof (edge or drain) to ensure water flows over laps of membrane. Proceed up slope at right angles to direction of flow.

    4. Position and unroll membrane to achieve correct overlap and alignment with roof line. Re-roll 1 end minimum 3 m (10') and adhere to substrate. Complete application of remainder of sheet.

    5. Unroll base sheet mopping hot asphalt at rate of 1 kg/m2 to 1.5 kg/m2 (0.2 lbs/sq ft to 0.3 lbs/sq ft), not more than 1000 mm (3') ahead of roll. Press base sheet into hot mopped asphalt. Lay base sheet with 75 mm (3") side laps and 150 mm (6") end laps.

    6. Ensure flow out bead is present at all locations along lap edges. Avoid excessive asphalt seepage. Maximum seepage allowed 6 mm (1/4").

    7. At walls and vertical surfaces, extend membrane minimum 50 mm (2") on vertical surface [and nailed at 300 mm (12") oc].

8. Cap Sheet Membrane:

    1. Do not apply cap sheet until base sheet and flashing have been applied and show no sign of defects.

    2. Ensure flame guard self adhesive tape are installed at openings and at junction which may expose combustible substrates prior to torching.

    3. Plan cap sheet application so side and end laps are offset from those of base sheet minimum 300

mm (12") for side and 450 mm (18") for end laps. Mark chalk line, centred on base sheets, where first course is to start. Unroll 2 m - 3 m (6' - 9') of membrane and line it up to chalk lines or to selvage edge. If roll goes out of line by more than 13 mm (1/2"), cut and re-align. Re-roll from both ends and apply in both directions.

4. Lay cap sheet with 75 mm (3") side laps to cover selvage edge and 150 mm (6") end laps.

5. Commence application of cap sheet with 1 m (39") square of cap sheet centred on each drain and torched down.

6. Apply 1 ply of cap sheet granule side up. Position and unroll cap sheet to achieve correct overlap and alignment. Re-roll 1 end minimum 3 m (10') and adhere to substrate. Complete application of remainder of sheet. Torch weld by sufficiently heating lower surface of membrane evenly across width of roll to melt lower surface and provide flow of bitumen. At same time unroll roofing membrane into melted bitumen. Keep checking adhesion to be certain asphalt is hot enough. Take care and inspect so heating is even across width to avoid skips or voids. Install cap sheet in same direction as base sheet.

7. Ensure flow out bead is present at all locations along lap edges. Avoid excessive asphalt seepage. Maximum seepage allowed 6 mm (1/4").

8. Once cap sheet is installed, carefully inspect joints and surfaces. Take great care to ensure asphalt does not spread out over exposed part of cap sheet.

9. If there are marks of asphalt or excessive asphalt seepage, reheat these areas with a torch and apply matching factory provided granules before bitumen cools to provide clean appearance. Press granules in place with a damp sponge.

10. Bevel "T" joints at end or head laps and repair fishmouths using torch heated trowel.

11. Cut out drain opening after drain clamps have been installed.

9. Cap Sheet Flashing:

    1. Provide flame guard self adhesive tape at openings and at junction which may expose combustible substrates prior to torching.

    2. Pre-cut flashing in strips 1 m (39") wide to correct length to extend minimum 150 mm (6") onto field of roof, up vertical surface and over any fascia minimum 50 mm (2"). Ensure side laps are 75 mm (3") and staggered minimum of 100 mm (4") with laps of base sheet. Dry fit pieces to proper size.

    3. Using chalk line, lay out straight line on cap sheet surface, parallel to roof edge, 150 mm (6") inside roof from parapet wall.

    4. Soften bitumen by heating mineral surface with torch. When granules start to sink into bitumen, stop torching and with hot round nosed trowel, embed granules in bitumen from chalk line to edge of cap sheet.

    5. Torch apply cap sheet completely covering base sheet, lapping edges to selvage. Ensure torch welding softens under side of base sheet without overheating, resulting in uniform adhesion over entire surface. Press in firmly for proper adhesion with wet sponge. Continue by bonding upper portion to wall, taking precautions not to stretch membrane.

    6. Anchor, with tin capped nails or roofing nails and disks or membrane manufacturer's recommended fasteners placed at top of flashing and driven into wood backing. Protect exposed top edge with continuous metal flashings or termination bar.

    7. Ensure flow out bead is present at all locations along lap edges. Avoid excessive asphalt seepage.

Maximum seepage allowed 6 mm (1/4").

8. Once cap sheet is installed, carefully inspect joints and surfaces. Take great care to ensure asphalt does not spread out over exposed part of cap sheet.

9. If there are marks of asphalt or excessive asphalt seepage, reheat these areas with a torch and apply matching factory provided granules before bitumen cools to provide clean appearance. Press granules in place with a damp sponge.

10. Mechanical Equipment and Supports: Install equipment supports in accordance with manufacturer's instructions.

3.4 SITE QUALITY CONTROL

1. Site Tests and Inspections:

    1. Consultant may appoint an independent roofing inspection company.

    2. If required by inspection company or by Consultant, make any cut tests. This Subcontractor will pay costs of such tests and making good afterwards to roofing.

    3. Owner may engage independent inspection company to inspect work of this Section. Give at least 2 weeks notice of starting work and allow inspector free access. Inspection may include thermographic survey of completed roof.

    4. Inspection - Roof Levels:

        1. Before roofing is commenced, inspect and check roof surfaces for levels.

        2. Undertake a series of spot level checks to determine if there is any unevenness in roof decks which may result in pools of water being left on completed roofing in excess of 13 mm (1/2") depth.

        3. Ensure deck has been inspected prior to start of roofing work.

2. Manufacturer Services: Ensure to arrange for membrane manufacturer representative's site visit on Day roofing is commenced and periodically thereafter, to ensure work is properly performed. Upon completion of work of this Section, ensure manufacturer's representative inspects roof and verifies quality of work to yield weathertight waterproofing roofing system and issue manufacturer's warranty. Ensure Manufacturer's representative informs Consultant, Contractor and Subcontractor executing work of this Section promptly in writing when inspection is complete and provide detailed report.

3.5 CLEANING

1. Waste Management: Discard and legally dispose components that cannot be applied within its stated shelf life to requirements of authorities having jurisdiction.

3.6 PROTECTION

1. Protect work of this Section from damage. Replace damaged work which cannot be satisfactorily repaired, restored or cleaned at no cost to Owner.

2. Provide protection covering out of 13 mm (1/2") thick plywood underlaid with 25 mm (1") thick polystyrene insulation board adhered to it, over roofed areas when working from, or over, such roof surfaces. Provide such protection below hoist rigs, ladders, pallets of material and in other circumstances where the roofing membrane is exposed to potential damage. Secure protection boards mechanically against wind storm loss.

3. Protect finished wall and roof surfaces against damage of any kind. Protect finished sheet metal work and membrane flashing against punctures and damage of any kind. Be responsible for damage sustained by work of this trade. Do not use equipment over the roofing materials which would cause damage to the materials in any way.

4. Protect surrounding work, and adjacent building and other property from damage during roofing operations, taking particular care to prevent bitumen droppings and discolouration of surrounding buildings by smoke from kettles. Locate kettles to prevent smoke entering adjacent and Project buildings.

5. Use protection covering specified in work areas and along work routes as required to prevent damage to steel deck, or sheathing and roofing. Ensure workers stay off newly heat welded membrane until cooled.

6. Protect completed portions of roof from damage.

7. At conclusion of each Day's work, seal exposed edges of roof insulation. Remove when resuming work.

8. Do not torch over or near flammable substrates such as fibreboard.

9. Fire Protection:

    1. Respect safety measures described in manufacturer's literature as well as local jurisdictional authorities.
    2. Have a 9 kg (20 lb) dry chemical fire extinguisher acceptable to authorities having jurisdiction, fully charged and in operable condition at every location where open flames are used.
    3. During roofing maintain a clean site and keep 2 foam or dry type fire extinguishers on roof within easy access of torching application and in any open flame location while roofing is in progress.
    4. Verify no vent pipes venting flammable fumes (i.e. fuel storage tanks) are located in area of work.
    5. Do not have gasoline or other flammable solvents on roof while torching.
    6. Be vigilant against self starting fires at end of roofing operations cease for Day. Use a heat detector gun to spot any smouldering or concealed fire. Examine roof for hot spots 1 hour after completion of roofing operations, especially at flashings and around roof penetrations.

End of Section 07 52 16

1 GENERAL

1.1 SUMMARY

1. Section Includes: Manual overhead insulated rolling doors.

2. Related Sections:

.1 05 50 00 Metal Fabrications. Door opening jamb and head members.
.2 06 10 00 Rough Carpentry. Door opening jamb and head members.
.3 08 70 00 Hardware. Padlocks. Master keyed cylinder.
.4 09 91 00 Painting. Field painting.

1.2 SYSTEM DESCRIPTION

1. Design Requirements:

.1 Air Infiltration to Comply With:
1. **ASHRAE®** (American Society of Heating, Refrigeration, and Air
2. Conditioning Engineers) Standard 90.1-2007, 2010 & 2013 requirements of less than .3 CFM/FT2
3. **IECC®** (International Energy Conservation Code) 2021 requirements of less than 0.9 CFM/FT2
4. **California Title 24** requirements of less than 0.9 CFM/FT2

.2 Wind Loading:
1. Supply doors to withstand up to 20 psf (1000 Pa) design wind load

.3 Cycle Life:
1. Design doors of standard construction for normal use of up to 20 cycles per day maximum, and an overall maximum of 50,000 operating cycles for the life of the door

.4 Seismic Performance:
1. Provide manufacturer's seismic calculations confirming ASCE7-10

.5 Insulated Door Slat Material Requirements:
1. Flame Spread Index of 35 and a Smoke Developed Index of 400 as tested per ASTM E84.
2. Sound Transmission Class (STC) rating up to 27 for the entire assembly. All configurations are evaluated per ASTM E90 and based on testing a complete, operable assembly.
3. U-factor listing of 0.532 for entire door assembly per DASMA-105.
4. Insulation to be CFC Free with an Ozone Depletion Potential (ODP) rating of zero

.6 Safety:
1. Chain operated doors shall be designed so that the door immediately stops upward or downward travel and is maintained in a stationary position when the hand chain is released by user.

1.3 SUBMITTALS

1. Reference Section 01 33 00 Submittal Procedures; submit the following items:
.1 Product Data

.2 Shop Drawings: Include special conditions not detailed in Product Data. Show interface with adjacent work.

.3 Quality Assurance/Control Submittals:

1. Provide manufacturer ISO 9001:2015 registration
2. Provide manufacturer and installer qualifications - see below
3. Provide manufacturer's installation instruction
4. Manufacturer must provide independent testing lab results proving .3 CFM/FT2 or less air infiltration

.4 Closeout Submittals:

1. Operation and Maintenance Manual
2. Certificate stating that installed materials comply with this specification

1.4 QUALITY ASSURANCE

1. Qualifications:
   .1 Manufacturer Qualifications: ISO 9001:2015 registered and a minimum of five years' experience in producing doors of the type specified
   .2 Installer Qualifications: Manufacturer's approval

1.5 DELIVERY STORAGE AND HANDLING

1. Reference Section 01 66 00 Product Storage and Handling Requirements.
2. Follow manufacturer's instructions

1.6 WARRANTY

1. Standard Warranty: Two years from date of shipment against defects in material and workmanship.

2. Maintenance: Submit for owner's consideration and acceptance of a maintenance service agreement for installed products.

2 PRODUCT

2.1 MANUFACTURER

1. Manufacturer:
   .1 Cookson
   .2 Cornell
   .3 Clopay Building Products

2.2 PRODUCT INFORMATION

1. Model: ESD40

2.3 MATERIALS

1. **Curtain:** Thermally broken; Air infiltration rate of 0.29 CFM/FT2, as tested per ASTM E283 validated by an independent testing agency. Test report upon asking.

   .1 Fabrication:

1. Slat Material: No. 6B
    1) Galvanized Steel with Finish as Described Below: Manufacturer recommended gauge based on performance requirements. Minimum 24 gauge, Grade 40, ASTM A 653 galvanized steel zinc coating. Gray CPVC backer slat
2. Insulation: 7/8 inch (22 mm) thick fire retardant mineral wool, ASTM C665-95 or ASTM C612-93
3. Total Slat Thickness: 15/16 inch (24 mm)
4. Flame Spread Index of 35 and a Smoke Developed Index of 400 as tested per ASTM E84

.2 Finish (Front slat only):

.1 GalvaNex™ Coating System (Stock Colors):

1) GalvaNex™Ultra- Ultra Powder Coat to be applied as a protective top coat over GalvaNex finish. Top coat is a polyester based structured wear resistant clear powder coat of 2.5-3.5 mils cured film thickness. ASTM D-3363 pencil hardness: 2H or better. Tested per ASTM B117. Base coating of GalvaNex to be ASTM A 653 galvanized base coating treated with dual process rising agents in preparation for chemical bonding baked-on base coat and gray baked-on polyester enamel finish coat.

2. **Endlocks**: Fabricate interlocking sections with high strength galvanized cast iron endlocks on alternate slats each secured with two ¼" (6.35 mm) rivets. Provide windlocks as required to meet specified wind load.

3. **Bottom Bar**

.1 Configuration:

1. Extruded Aluminum (Standard on doors 21.5' DBG and smaller): Extruded aluminum alloy 6063-T5, min height 3 3/8" min base thickness 3/16", min width 4"

.2 Finish:

1. Aluminum: Clear **anodized**

2. Air Infiltration Certification Label: Must be affixed to bottom bar

4. **Guides**:

.1 Fabrication:

1. Minimum 3/16 inch (4.76 mm) stainless steel angles. Provide windlock bars of same material when windlocks are required to meet specified wind load. Top of inner and outer guide angles to be flared outwards to form bellmouth for smooth entry of curtain into guides. Provide removable guide stoppers to prevent over travel of curtain and bottom bar.

.2 Finish:

1. Powder Coat (Stock Colors): Zirconium treatment followed by a gray baked-on polyester powder coat; minimum 2.5 mils (0.065 mm) cured film thickness

5. **Counterbalance Shaft Assembly:**

.1 Barrel: Steel pipe capable of supporting curtain load with maximum deflection of 0.03 inches per foot (2.5 mm per meter) of width
.2 Spring Balance: Oil-tempered, heat-treated steel helical torsion spring assembly designed for proper balance of door to ensure that maximum effort to operate will not exceed 25 lbs (110 N). Provide wheel for applying and adjusting spring torque.

6. **Brackets**:

Fabricate from minimum 3/16 inch (5 mm) steel plate with permanently lubricated ball or roller bearings at rotating support points to support counterbalance shaft assembly and form end closures

.1 Finish:
1. Powder Coat (Stock Colors): Zirconium treatment followed by a gray baked-on polyester powder coat; minimum 2.5 mils (0.065 mm) cured film thickness

7. **Hood**:

Minimum 24 gauge galvanized steel with reinforced top and bottom edges. Provide minimum 1/4 inch (6.35 mm) steel intermediate support brackets as required to prevent excessive sag.

1. Finish:
1. GalvaNex™ Coating System (Stock Colors):
1) ASTM A 653 galvanized base coating treated with dual process rinsing agents in preparation for chemical bonding baked-on base coat and gray baked-on polyester finish coat

8. **Weatherstripping**:

.1 Bottom Bar: Replaceable, bulb-style, compressible EDPM gasket extending into guides
.2 Guides: Replaceable vinyl strip on guides sealing against [fascia side] [both sides] of curtain
.3 Lintel Seal: Double brush seal with EPDM sandwiched between the two brush seals at door header to impede air flow.
.4 Hood: Neoprene/rayon baffle to impede air flow above coil
.5 Guide Seal: For face of wall applications, a foam block will be supplied for the area between the inner guide angle and wall construction. For between jambs applications, silicone around each angle joint will be required.

2.4 OPERATION

1. **A. Manual ControlGard Chain Hoist:** Provide chain hoist operator with endless steel chain, chain pocket wheel and guard, geared reduction unit, and chain keeper

secured to guide. Chain hoist to include integral brake mechanism that will immediately stop upward or downward travel and maintain the door in a stationary position when the hand chain is released by the user

2.5 ACCESSORIES

1. Locking:
   .1 **Padlockable slide bolt** on coil side of bottom bar at each jamb extending into slots in guides.
   .2 **Padlockable chain keeper** on guide.
   .3 **Masterkeyable cylinder** operable from coil side of bottom bar, options for all types of operation.
      i. a. Standard Mortise Cylinder

2. **Operator and Bracket Mechanism:** Cover: Minimum 24-gauge galvanized steel sheet metal cover to enclose exposed moving operating components at coil area of unit. Finish to match door hood.

3. **Strip Door Bracket:** Assembly integral to coiling door to hang strip door on interior of building. Contact factory for sizes greater than 12'-0" x 12-0". Powder-coated finish to match coiling door.

3 EXECUTION

3.1 EXAMINATION

1. Examine substrates upon which work will be installed and verify conditions are in accordance with approved shop drawings

2. Coordinate with responsible entity to perform corrective work on unsatisfactory substrates

3. Commencement of work by installer is acceptance of substrate

3.2 INSTALLATION

1. General: Install door and operating equipment with necessary hardware, anchors, inserts, hangers and supports

2. Follow manufacturer's installation instructions

3.3 ADJUSTING

1. Following completion of installation, including related work by others, lubricate, test, and adjust doors for ease of operation, free from warp, twist, or distortion

3.4 CLEANING

1. Clean surfaces soiled by work as recommended by manufacturer.
2. Remove surplus materials and debris from the site

3.5 DEMONSTRATION

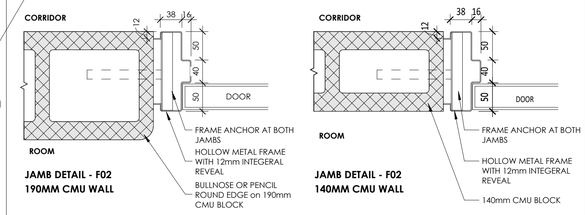
1. Demonstrate proper operation to Owner's Representative
2. Instruct Owner's Representative in maintenance procedures

End of Section 08 33 00

DOOR SCHEDULE

DOOR NUMBER	ROOM NAME	FIRE RATING	DOOR PANEL TYPE	WIDTH	HEIGHT	THICKNESS	MATERIAL	FINISH	DOOR FRAME TYPE	MATERIAL	FINISH	SIDELITE GLASS	HARDWARE	SECURITY	COMMENTS
101	ENTRANCE LOBBY		XP02.1	1980	2100	40	AL/GL	AN	F01	AL	AN	TP	BFO,HO,PDO,WS,TS,PB,DCL	DR,CR,ES,	
102.1	CORRIDOR		XP01	990	2100	40	HM	PT	F03	HM	PT		HO,WS,TS,PB,DCL	DR,CR,ES,	
102.2	CORRIDOR		P01.1	1800	2100	40	HM	PT	F02	HM	PT		BFO		NOTE A
102.3	CORRIDOR		XP01	990	2100	40	HM	PT	F03	HM	PT		HO,WS,TS,PB,DCL	DR,CR,ES,	
103	TRAINER/COACH ROOM	R11	P01	990	2100	40	HM	PT	F02	HM	PT				
104.1	CHANGE ROOM A		P01	990	2100	40	HM	PT	F02	HM	PT		BFO		
104.2	CHANGE ROOM A		P01	990	2100	40	HM	PT	F02	HM	PT		BFO		
106	BF WASHROOM A		P01	990	2100	40	HM	PT	F02	HM	PT		DCL,AA,IL,PLB,PDO		
107.1	CORRIDOR		P01	990	2100	40	HM	PT	F02	HM	PT				
107.2	TURF STORAGE		XP03	1830	2200	40	HM	PT	F02	HM	PT				
108	STORAGE A		P01	990	2100	40	HM	PT	F02	HM	PT				
109	TRAINER/COACH ROOM		P01	990	2100	40	HM	PT	F02	HM	PT				
110.1	CHANGE ROOM B		P01	990	2100	40	HM	PT	F02	HM	PT		BFO		
110.2	CHANGE ROOM B		P01	990	2100	40	HM	PT	F02	HM	PT		BFO		
112	WASHROOM B		P01	990	2100	40	HM	PT	F02	HM	PT		DCL,AA,IL,PLB,PDO		
113	STORAGE B		P01	990	2100	40	HM	PT	F02	HM	PT				
114	JAN.	0HR	P01	990	2100	40	HM	PT	F02	HM	PT				
115	ELECTRICAL ROOM		P01	990	2100	40	HM	PT	F02	HM	PT				

R9



JAMB DETAIL - F02
190MM CMU WALL

JAMB DETAIL - F02
140MM CMU WALL

DOORS: MATERIALS	
TAG	ITEM
HM	HOLLOW METAL
GL	GLASS
CW	CURTAIN WALL
WSC	SOLID WOOD CORE
ALUM	ALUMINIUM

DOORS: FINISH	
TAG	ITEM
PREFIN	PREFINISHED
PNT	PAINT
GAL	GALVANIZED
STN	STAIN
AN	ANODIZED

HARDWARE	
TAG	ITEM
HO	HOLD OPEN
PDO	POWER DOOR OPERATOR W// PUSH BUTTON
WS	WEATHER STRIPPING
TB	THERMALLY BROKEN FRAME
PB	PANIC BAR
AA	AUDIBLE ALARM
IL	IN-USE LIGHT
PLB	PUSH TO LOCK BUTTON
DCL	DOOR CLOSER

SECURITY	
TAG	ITEM
DC	DOOR CONTACT
CR	CARD READER
ES	ELECTRIC STRIKE

DOOR SCHEDULE NOTES:

NO.	NOTE
NOTE A	EXISTING DOOR TO BE REPLACED WITH NEW DOOR WITH NEW FRAME AND NEW HARDWARE THE DIMENSIONS OF THE EXISITNG DOOR NEED TO BE VERIFEID ON SITE

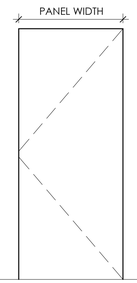
REFER HARDWARE SCHEDULE FOR THRESHOLD AND HARDWARE

DOOR PANELS - INTERIOR

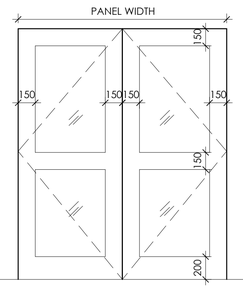
P01

P01.1
DOUBLE PANEL - P01

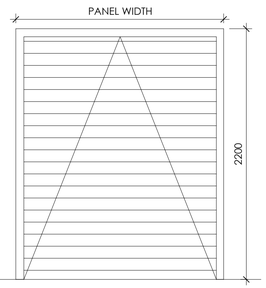
DOOR PANELS - EXTERIOR



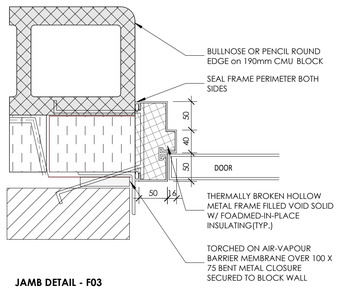
XP01



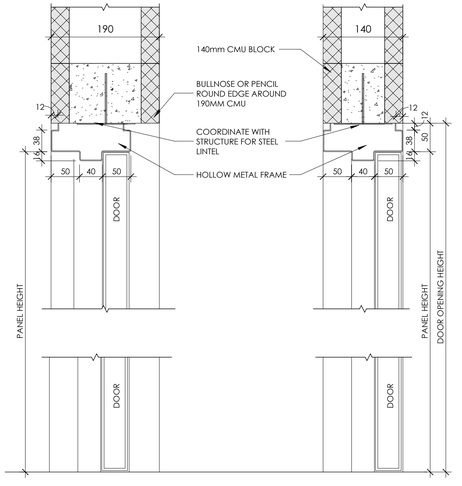
XP02.1
DOUBLE PANEL - P02



XP03
ROLLING SHUTTER



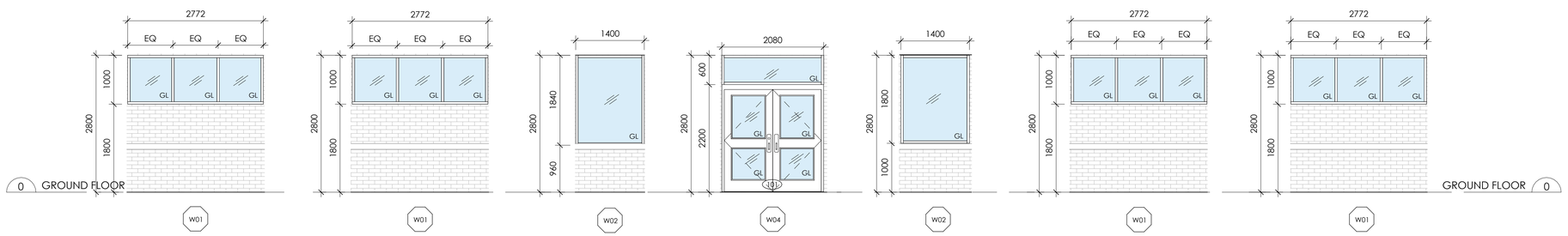
JAMB DETAIL - F03
EXTERIOR



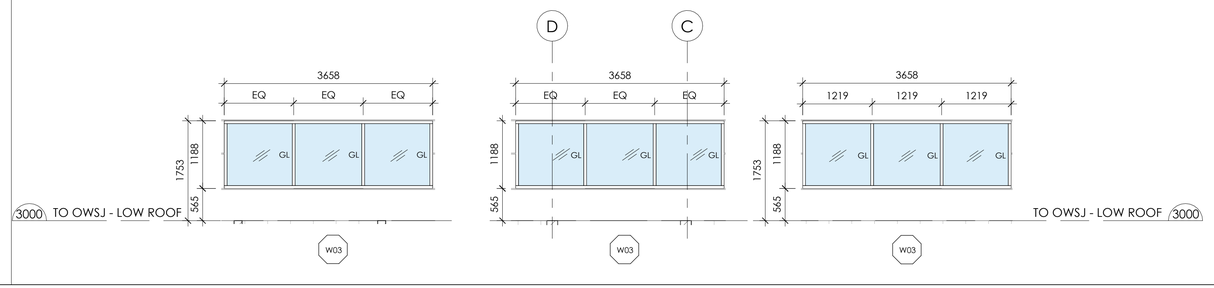
HEAD DETAIL - F02
190MM CMU WALL

HEAD DETAIL - F02
140MM CMU WALL

WEST ELEVATION



EAST ELEVATION

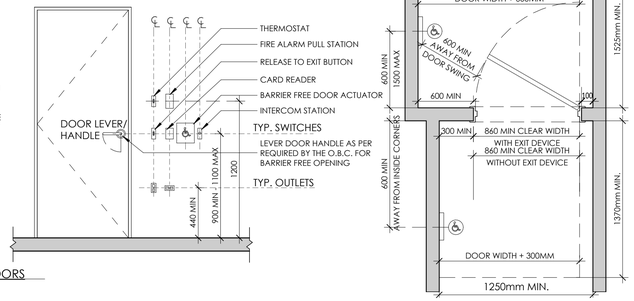


BARRIER FREE DESIGN FOR DOORS
& MOUNTING HEIGHTS FOR ELECTRICAL DEVICES & OUTLETS:

GENERAL NOTES

1. ALL DOORS IN BARRIER FREE PATH OF TRAVEL MUST MAINTAIN THE MINIMUM CLEARANCES NOTED IN THE DIAGRAM AS PER OBC SECTION 3.8.3.3. (UNLESS EQUIPPED WITH ADO'S)
2. COORDINATE ALL EXIT DEVICES AND DOOR THICKNESS TO MAINTAIN A MINIMUM BARRIER FREE PATH OF TRAVEL AS NOTED IN THE DIAGRAM AS PER O.B.C. SECTION 3.8.3.3.
3. ALL DOORS IN A BARRIER FREE PATH OF TRAVEL ARE TO RECEIVE LEVER TYPE DOOR HANDLES THAT MEET THE REQUIREMENTS OR O.B.C. 3.8.3.3.
4. THRESHOLDS IN A BARRIER FREE PATH OF TRAVEL SHALL CREATE A CHANGE IN LEVEL OF NO MORE 13MM.

THIS SCHEDULE TO BE READ IN CONJUNCTION WITH DOCUMENTS PROVIDED BY SECURITY CONSULTANT, ELECTRICAL ENGINEER, HARDWARE CONSULTANT AND SPECIFICATIONS.



BARRIER FREE DESIGN FOR DOORS
1 : 25

LEGEND

GL	VISION GLASS
SG	SPANDREL GLASS
TG	TEMPERED GLASS
FRG	FIRE RATED GLASS
LG	LAMINATED GLASS (TO MEET OBC REQUIREMENT FOR GUARD AS PER O.B.C. 3.1.20.1 AND 4.1.5.14)

REVISIONS:

NO.	DATE	PARTICULAR
3	2024.05.14	ISSUED FOR CLIENT REVIEW
4	2024.07.11	ISSUER FOR 75% CD AND HERITAGE PERMIT
5	2024.07.26	ISSUER FOR 90% CD
6	2024.08.26	ISSUED FOR PERMIT & TENDER
7	2024.09.20	RE-ISSUED FOR TENDER
9	2024.10.10	ISSUED FOR TENDER ADDENDUM 2
11	2024.10.21	ISSUED FOR TENDER ADDENDUM 5

NOTES:

All dimensions and measurements must be checked and verified by the General Contractor

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KEY PLAN:

CLIENT:
CITY OF BRAMPTON,
2 Wellington Street W
Brampton, ON. L6Y 4R2

PROJECT:
22344

Brampton Memorial Arena Expansion

69 Elliott St,
Brampton, ON L6Y 1W2

ORIGINAL PAGE SIZE: ARCH D - 24" x 36"
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A - DETAIL NO.
B - DETAIL NO. ORIGIN

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THE VENTIN GROUP LTD

ONTARIO ASSOCIATION OF ARCHITECTS
CHRISTOPHER JOHN HALL
LICENCE
5396

SCALE:As indicated

DOOR SCHEDULE & EXTERIOR GLAZING

A8.1

PLOT DATE: 2024.10.22 1:51:34 PM
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