

The Township of



Rideau Lakes

ADDENDUM #1

**Roof Replacement - Elgin Municipal
Complex**

A-PW2020-31

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The Township is releasing an addendum to PW-2021-30 to clarify the following items noted below. A revised submission form adapted from the original RFT 2020-31 document has been developed to provide an option for submitting a 20-year warranty low sloped roof and is found in this Addendum as "Addendum 1 Appendix 1."

- The clocktower was not originally included in the request, but may be added as an additional "add on" provisional item.

Regarding the low slope roof warranty:

- The Township is looking for options on either a 20-year or 40-year warranty low slope roof replacement. For 20-year warranty options, please see "Addendum 1 Appendix 2" for a 20-year low slope roof specifications.

Regarding the insulation system on the flat roof and the drain sump sizes:

- The new roof is to contain 25mm Iso as a base layer, with a 1% completely tapered insulation system and drain sumps above this. Drain sump sizes to remain 8'x8'
- A complete tapered insulation package is required which will achieve a 1% slope minimum throughout. Sumps to be included at all drain locations 8' x 8' o.c. with 2% slope. No additional backslope required

Regarding the panel widths for the fastened metal roof system:

- Option 1 "through fastened metal roof system" 36" panel widths will be acceptable
- Option 2 "concealed fastener metal roof system" 16" panel widths will be acceptable

Regarding venting requirements:

- Ridge venting is the standard requirement

ADDENDUM 1 APPENDIX 1: REVISED TENDER SUBMISSION FORM

TENDER NUMBER: PW2020-31
PROJECT NAME: Roof Replacement at Elgin Municipal Complex

This appendix forms part of the tender process and shall be included with the proposal submission and must be signed and dated below. Failure to submit appendix "I" tender submission form may result in disqualification of the proposal at the sole discretion of the Township of Rideau Lakes.

NOTE:

Total cost to be entered on tender submission form (Part One). The Township of Rideau Lakes reserves the right to add or delete any work, based on the unit prices given, subject to availability of funds. The Township of Rideau Lakes will not be responsible for any costs or losses in the preparation of this tender. It is the Respondent's responsibility to visit each unit to ensure that all conditions and measurements that exist will be taken into consideration and shall be included into the total price.

Base Bids: Section 1.0; Section 2.0; Section 2.1; and Section 2.2 of Appendix VII Roof Plan (portion of roof)

DESCRIPTION	COST (HST excluded)
<i>Steep Slope Roof Options</i>	
<p>OPTION 1: Removal of existing shingles and installation of new heritage style through fastened metal roof system on all sloped roof areas. Includes new eaves trough, downspouts, snow guards and accessories as described. Include 3 year workmanship warranty as well as manufacturers 20 year finish warranty on the metal roof system.</p>	
<p>OPTION 2: Removal of existing shingles and installation of new heritage style concealed fastener metal roof system on all sloped roof areas. Includes new eaves trough, downspouts, snow guards and accessories as described. Include 3 year workmanship warranty as well as manufacturers 20 year finish warranty on the metal roof system.</p>	
<p>OPTION 3: Removal of existing shingles and installation of new heritage style architectural shingle roof system on all sloped roof areas. Includes new eaves trough, downspouts, snow guards and accessories as described. Include 3 year workmanship warranty as well as manufacturers 20 year warranty against defects.</p>	

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Low Slope Roof Options	
<p>OPTION 1: Removal of existing modified bitumen roof and installation of new zero VOC and low odour modified bitumen system over the low slope roof area as described. Include 3 year workmanship warranty as well as manufacturers 40 year leak free, no dollar limit warranty.</p>	
<p>OPTION 2: Removal of existing modified bitumen roof and installation of new Hot Asphalt applied modified bitumen system over the low slope roof area as described. Include 3 year workmanship warranty as well as manufacturers 20 year leak free, no dollar limit warranty.</p>	

Line Items Beyond the Base Bids

DESCRIPTION	COST (HST excluded)
Unit Cost to remove and replace 4'x8' Plywood (if required)	
Unit Cost to remove and replace Steel Decking Per Sq Ft (if required)	
Unit Cost to remove and replace wood blocking Per Sq Ft (if required)	
Unit Cost to coat surface corrosion of metal deck with rust inhibitive coating Per Sq Ft (if required)	

Provisional Bids – Section 1.0; Section 2.0; Section 2.1; Section 2.2; Section 3.0; Section 4.0; and Section 5.0 of Appendix VII Roof Plan (All roof sections)

DESCRIPTION	COST (HST excluded)
Steep Slope Roof Options	
<p>OPTION 1: Removal of existing shingles and installation of new heritage style through fastened metal roof system on all sloped roof areas. Includes new eaves trough, downspouts, snow guards and accessories as described. Include 3 year workmanship warranty as well as manufacturers 20 year finish warranty on the metal roof system.</p>	
<p>OPTION 2: Removal of existing shingles and installation of new heritage style concealed</p>	

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<p>fastener metal roof system on all sloped roof areas. Includes new eaves trough, downspouts, snow guards and accessories as described. Include 3 year workmanship warranty as well as manufacturers 20 year finish warranty on the metal roof system.</p>	
<p>OPTION 3: Removal of existing shingles and installation of new heritage style architectural shingle roof system on all sloped roof areas. Includes new eaves trough, downspouts, snow guards and accessories as described. Include 3 year workmanship warranty as well as manufacturers 20 year warranty against defects.</p>	
Low Slope Roof Options	
<p>OPTION 1: Removal of existing modified bitumen roof and installation of new zero VOC and low odour modified bitumen system over the low slope roof area as described. Include 3 year workmanship warranty as well as manufacturers 40 year leak free, no dollar limit warranty.</p>	
<p>OPTION 2: Removal of existing modified bitumen roof and installation of new Hot Asphalt applied modified bitumen system over the low slope roof area as described. Include 3 year workmanship warranty as well as manufacturers 20 year leak free, no dollar limit warranty.</p>	

Line Items Beyond the Provisional Bids

DESCRIPTION	COST (HST excluded)
<p>Unit Cost to remove and replace 4'x8' Plywood (if required)</p>	
<p>Unit Cost to remove and replace Steel Decking Per Sq Ft (if required)</p>	
<p>Unit Cost to remove and replace wood blocking Per Sq Ft (if required)</p>	
<p>Unit Cost to coat surface corrosion of metal deck with rust inhibitive coating Per Sq Ft (if required)</p>	

Addendum 1 Appendix 2 - MODIFIED BITUMINOUS MEMBRANE ROOFING

1 GENERAL

1.1 SUMMARY

1.1.1 Existing Roof Composition

A. Area 2.0

Modified Bitumen membrane
25mm fiberboard
25mm polyisocyanurate insulation
Vapour barrier
Metal deck

1.1.2 New Roof Composition

B. Area 2.0

Flood and gravel roof surface with rubberized fire rated flood coat
2 ply modified bitumen membrane
6mm Recovery board
Tapered polyisocyanurate insulation
25mm polyisocyanurate insulation
Modified bitumen vapour retarder
13mm gypsum board
Metal deck

1.2 REFERENCES

- 2 References, General: The most recent adopted version of the following references apply to the Work of this Section.
- 3 International building Code (current edition) or local authority building code.
- 4 American Society of Civil Engineers (ASCE): ASCE 7, Minimum Design Loads for Buildings and Other Structures.
- 5 Asphalt Roofing Manufacturers Association (ARMA).
- 6 Canadian Roofing Contractors Association (CRCA): Roofing and Waterproofing Manual.
- 7 Canadian General Standards Board (CGSB)
- 8 Canadian Roofing Contractors Association (CRCA)
- 9 Underwriters Laboratories of Canada (ULC)

9.1 SUBMITTALS

- 9.1.1 Product Data: Manufacturer's data sheets on each product to be used, including:

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- 9.1.1.1 Preparation instructions and recommendations.
 - 9.1.1.2 Storage and handling requirements and recommendations.
 - 9.1.1.3 Installation instructions.
 - 9.1.2 Shop Drawings: Submit shop drawings including installation details of roofing, flashing, fastening, insulation and vapor barrier, including notation of roof slopes and fastening patterns of insulation and base modified bitumen membrane, prior to job start.
 - 9.1.3 Design Pressure Calculations: Submit design pressure calculations for the roof area in accordance with CSA A123.21, ASCE/SEI 49-12 and local Building Code requirements. Include a roof system attachment analysis report, certifying the system's compliance with applicable wind load requirements before Work begins.
 - 9.1.4 Manufacturer's Certificates: Provide to certify products meet or exceed specified requirements.
 - 9.1.5 Test Reports: Submit test reports, prepared by an independent testing agency, for all modified bituminous sheet roofing, indicating compliance with ASTM D5147. Testing must be performed at 77 deg. F. Tests at 0 deg. F will not be considered.
 - 9.1.6 Manufacturer's Fire Compliance Certificate: Certify that the roof system furnished is in accordance with ASTM E108, Class A for external fire and meets local or nationally recognized building codes.
 - 9.1.7 Closeout Submittals: Provide manufacturer's maintenance instructions that include recommendations for periodic inspection and maintenance of all completed roofing work. Provide product warranty executed by the manufacturer. Assist Owner in preparation and submittal of roof installation acceptance certification as may be necessary in connection with fire and extended coverage insurance on roofing and associated work.
- 9.2 QUALITY ASSURANCE
- 9.2.1 Perform Work in accordance with CRCA Roofing and Waterproofing Manual.
 - 9.2.2 Manufacturer Qualifications: Company specializing in manufacturing products specified with documented ISO 9001 certification and minimum of twelve years of documented experience and must not have been in a Division 1 or CCAA filing during the last five years.
 - 9.2.3 Installer Qualifications: Company specializing in performing Work of this section with minimum five years documented experience and a certified by the manufacturer as a Pre-Approved Contractor.
 - 9.2.4 Installer's Field Supervision: Maintain a full-time Supervisor/Foreman on job site during all phases of roofing work while roofing work is in progress.
 - 9.2.5 Product Certification: Provide manufacturer's certification that materials conform to requirements specified herein, are chemically and physically compatible with each other, and are suitable for inclusion within the total roof system specified herein.
 - 9.2.6 Source Limitations: Obtain all components of roof system from a single manufacturer. Secondary products that are required shall be recommended and approved in writing by

the roofing system Manufacturer. Upon request of the Architect or Owner, submit Manufacturer's written approval of secondary components in list form, signed by an authorized agent of the Manufacturer.

9.3 PRE-INSTALLATION MEETINGS

- 9.3.1 Convene minimum two weeks prior to commencing Work of this section.
- 9.3.2 Review installation procedures and coordination required with related Work.
- 9.3.3 Inspect and make notes of job conditions prior to installation:
 - 9.3.3.1 Record minutes of the conference and provide copies to all parties present.
 - 9.3.3.2 Identify all outstanding issues in writing designating the responsible party for follow-up action and the timetable for completion.
 - 9.3.3.3 Installation of roofing system shall not begin until all outstanding issues are resolved to the satisfaction of the Owner.

9.4 DELIVERY, STORAGE, AND HANDLING

- 9.4.1 Deliver and store products in manufacturer's unopened packaging with labels intact until ready for installation.
- 9.4.2 Store all roofing materials in a dry place, on pallets or raised platforms, out of direct exposure to the elements until time of application. Store materials at least 4 inches above ground level and covered with "breathable" tarpaulins.
- 9.4.3 Stored in accordance with the instructions of the manufacturer prior to their application or installation. Store roll goods on end on a clean flat surface. No wet or damaged materials will be used in the application.
- 9.4.4 Store at room temperature wherever possible, until immediately prior to installing the roll. During winter, store materials in a heated location with a 50 degree F (10 degree C) minimum temperature, removed only as needed for immediate use. Keep materials away from open flame or welding sparks.
- 9.4.5 Avoid stockpiling of materials on roofs without first obtaining acceptance from an Engineer.
- 9.4.6 Adhesive storage shall be between the range of above 50 degree F (10 degree C) and below 80 degree F (27 degree C). Area of storage shall be constructed for flammable storage.

9.5 COORDINATION

- 9.5.1 Coordinate Work with installing associated metal flashings as work of this section proceeds.
- 9.5.2 Contractor responsible for all mechanical, electrical and plumbing disconnects and connections. Sub-trades to be the responsibility of the roofing contractor and coordinated by the contractor.

9.6 PROJECT CONDITIONS

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- 9.6.1 Maintain environmental conditions (temperature, humidity, and ventilation) within limits recommended by manufacturer for optimum results. Do not install products under environmental conditions outside manufacturer's absolute limits.

9.7 SEQUENCING AND SCHEDULING

- 9.7.1 Sequence installation of roofing with related units of work specified in other sections to ensure that roof assemblies including roof accessories, flashing, trim and joint sealers are protected against damage from effects of weather, corrosion and adjacent construction activity.
- 9.7.2 Fully complete all roofing field assembly work each day. Phased construction will not be accepted.

9.8 WARRANTY

- 9.8.1 Upon completion of the work, provide the Manufacturer's written and signed NDL System Warranty, warranting that, if a leak develops in the roof during the term of this warranty, due either to defective material or defective workmanship by the installer, the manufacturer shall provide the Owner, at the Manufacturer's expense, with the labor and material necessary to return the defective area to a watertight condition.

- 9.8.1.1 Warranty Period:

- 9.8.1.1.1 20 years from date of acceptance.

- 9.8.2 Installer is to guarantee all work against defects in materials and workmanship for a period indicated following final acceptance of the Work.

- 9.8.2.1 Warranty Period:

- 9.8.2.1.1 3 years from date of acceptance.

10 PRODUCTS

10.1 MANUFACTURERS

- 10.1.1 Must provide daily progress inspections accompanied by a photo report for each day following contractor mobilization. Photo reports submitted to owner weekly.
- 10.1.2 Must provide annual visual inspections of the roof throughout the entire life of the manufacturer's warranty.
- 10.1.3 The Products specified are intended and the Standard of Quality for the products required for this project. If other products are proposed the bidder must request before the question deadline and receive Owner approval prior to bid closing.
 - 10.1.3.1 Bidder will not be allowed to change materials after the bid opening date.
 - 10.1.3.2 If alternate products are proposed, the products must be equal to or exceed the products specified. Supporting technical data shall be submitted to the Owner for approval prior to acceptance.
 - 10.1.3.3 In making a request for substitution, the Bidder/Roofing Contractor represents that it has:
 - 10.1.3.3.1 Personally investigated the proposed product or method, and determined that it is equal or superior in all respects to that specified.

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- 10.1.3.3.2 Will provide the same guarantee for substitution as for the product and method specified.
- 10.1.3.3.3 Will coordinate installation of accepted substitution in work, making such changes as may be required for work to be completed in all respects.
- 10.1.3.3.4 Will waive all claims for additional cost related to substitution, which consequently become apparent.
- 10.1.3.3.5 Cost data is complete and includes all related cost under his/her contract or other contracts, which may be affected by the substitution.
- 10.1.3.3.6 Will reimburse the Owner for all redesign costs for accommodation of the substitution.
- 10.1.3.4 Owner reserves the right to be the final authority on the acceptance or rejection of any or all bids, proposed alternate roofing systems or materials that has met ALL specified requirement criteria.
- 10.1.3.5 Failure to submit substitution package, or any portion thereof requested, will result in immediate disqualification and consideration for that particular contractors request for manufacturer substitution.

10.2 2-PLY MODIFIED BITUMEN ASPHALT ROOFING –

- 10.2.1 The following schedule is to form the minimum characteristics of the new roof membrane system.
- 10.2.2 Base (Ply) Sheet: One ply bonded to the prepared substrate with Interply Adhesive:
 - 10.2.2.1 80 mil SBS (Styrene-Butadiene-Styrene) rubber modified roofing base sheet reinforced with a fiberglass scrim, performance requirements according to ASTM D 5147.
 - 10.2.2.1.1 Tensile Strength, ASTM D 5147
 - 10.2.2.1.1.1 2 in/min. @ 0 +/- 3.6 deg. F MD 100 lbf/in XD 100 lbf/in
 - 10.2.2.1.1.2 50mm/min. @ -17.78 +/- 2 deg. C MD 17.5 kN/m XD 17.5 kN/m
 - 10.2.2.1.2 Tear Strength, ASTM D 5147
 - 10.2.2.1.2.1 2 in/min. @ 73.4 +/- 3.6 deg. F MD 110 lbf XD 100 lbf
 - 10.2.2.1.2.2 50mm/min. @ 23 +/- 2 deg. C MD 489 N XD 444 N
 - 10.2.2.1.3 Elongation at Maximum Tensile, ASTM D 5147
 - 10.2.2.1.3.1 2 in/min. @ 0 +/- 3.6 deg. F MD 4 % XD 4 %
 - 10.2.2.1.3.2 50mm/min@ -17.78 +/- 2 deg. C MD 4 % XD 4 %
 - 10.2.2.1.4 Low Temperature Flexibility, ASTM D 5147, Passes -40 deg. F (-40 deg. C)
- 10.2.3 Modified Cap (Ply): One ply bonded to the prepared substrate with Interply Adhesive:
 - 10.2.3.1 80 mil SBS (Styrene-Butadiene-Styrene) rubber modified roofing base sheet reinforced with a dual fiberglass scrim, performance requirements according to ASTM D 5147.
 - 10.2.3.1.1 Tensile Strength, ASTM D 5147
 - 10.2.3.1.1.1 2 in/min. @ 73.4 +/- 3.6 deg. F MD 540 lbf/in XD 540 lbf/in
 - 10.2.3.1.1.2 50 mm/min. @ 23 +/- 2 deg. C MD 94.2 kN/m XD94.2 kN/m
 - 10.2.3.1.2 Tear Strength, ASTM D 5147
 - 10.2.3.1.2.1 2 in/min. @ 73.4 +/- 3.6 deg. F MD 990 lbf XD 990 lbf
 - 10.2.3.1.2.2 50 mm/min. @ 23 +/- 2 deg. C MD 4,148 N XD 4,148 N
 - 10.2.3.1.3 Elongation at Maximum Tensile, ASTM D 5147
 - 10.2.3.1.3.1 2 in/min. @ 73.4 +/- 3.6 deg. F MD 9% XD 9%

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- 10.2.3.1.3.2 50 mm/min. @ 23 +/- 2 deg. C MD 9% XD 9%
- 10.2.3.1.4 Low Temperature Flexibility, ASTM D 5147, Passes -40 deg. F (-40 deg. C)
- 10.2.4 Interply Adhesive: Field and Flashing base and cap plies. Generic Type III Asphalt: Hot Bitumen, ASTM D 312, Type III steep asphalt having the following characteristics:
 - 10.2.4.1.1 Softening Point 185 deg. F - 205 deg. F
 - 10.2.4.1.2 Flash Point 500 deg. F
 - 10.2.4.1.3 Penetration @ 77 deg. F 15-35 units
 - 10.2.4.1.4 Ductility @ 77 deg. F 2.5 cm
- 10.2.5 Flashing Base Ply: Apply 2 plies of perforated 15lb felts, followed by One ply bonded to the prepared substrate with Interply Adhesive:
 - 10.2.5.1 80 mil SBS (Styrene-Butadiene-Styrene) rubber modified roofing base sheet reinforced with a fiberglass scrim, performance requirements according to ASTM D 5147.
 - 10.2.5.1.1 Tensile Strength, ASTM D 5147
 - 10.2.5.1.1.1 2 in/min. @ 0 +/- 3.6 deg. F MD 100 lbf/in XD 100 lbf/in
 - 10.2.5.1.1.2 50mm/min. @ -17.78 +/- 2 deg. C MD 17.5 kN/m XD 17.5 kN/m
 - 10.2.5.1.2 Tear Strength, ASTM D 5147
 - 10.2.5.1.2.1 2 in/min. @ 73.4 +/- 3.6 deg. F MD 110 lbf XD 100 lbf
 - 10.2.5.1.2.2 50mm/min. @ 23 +/- 2 deg. C MD 489 N XD 444 N
 - 10.2.5.1.3 Elongation at Maximum Tensile, ASTM D 5147
 - 10.2.5.1.3.1 2 in/min. @ 0 +/- 3.6 deg. F MD 4 % XD 4 %
 - 10.2.5.1.3.2 50mm/min@ -17.78 +/- 2 deg. C MD 4 % XD 4 %
 - 10.2.5.1.4 Low Temperature Flexibility, ASTM D 5147, Passes -40 deg. F (-40 deg. C)
- 10.2.6 Flashing Cap (Ply) Sheet: One ply bonded to the prepared substrate with Interply Adhesive:
 - 10.2.6.1 80 mil SBS (Styrene-Butadiene-Styrene) rubber modified roofing base sheet reinforced with a dual fiberglass scrim, performance requirements according to ASTM D 5147.
 - 10.2.6.1.1 Tensile Strength, ASTM D 5147
 - 10.2.6.1.1.1 2 in/min. @ 73.4 +/- 3.6 deg. F MD 540 lbf/in XD 540 lbf/in
 - 10.2.6.1.1.2 50 mm/min. @ 23 +/- 2 deg. C MD 94.2 kN/m XD94.2 kN/m
 - 10.2.6.1.2 Tear Strength, ASTM D 5147
 - 10.2.6.1.2.1 2 in/min. @ 73.4 +/- 3.6 deg. F MD 990 lbf XD 990 lbf
 - 10.2.6.1.2.2 50 mm/min. @ 23 +/- 2 deg. C MD 4,148 N XD 4,148 N
 - 10.2.6.1.3 Elongation at Maximum Tensile, ASTM D 5147
 - 10.2.6.1.3.1 2 in/min. @ 73.4 +/- 3.6 deg. F MD 9% XD 9%
 - 10.2.6.1.3.2 50 mm/min. @ 23 +/- 2 deg. C MD 9% XD 9%
 - 10.2.6.1.4 Low Temperature Flexibility, ASTM D 5147, Passes -40 deg. F (-40 deg. C)
- 10.2.7 Surfacing: Aggregate/Flood Coat
 - 10.2.7.1.1 Pea Gravel
 - 10.2.7.1.2 Asphalt protective roof coating, heavy-bodied, fiber reinforced, cold process roof coating having the following characteristics:
 - 10.2.7.1.2.1 Weight/Gallon 9.1 lbs./gal. (1.1 g/cm³)
 - 10.2.7.1.2.2 Non-Volatile % (ASTM D 4479) Typical 75

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10.2.7.1.2.3 Viscosity Brookfield RVT;

10.2.7.1.2.4 Spindle #5; 10RPM @ 71 deg. F 20,000-25,000 cPs

10.3 ACCESSORIES:

10.3.1 Roof Insulation Package:

10.3.1.1 Tapered system to be utilized as designed in this tender package.

10.3.1.2 Over the steel deck, fasten DensDeck Prime as per wind uplift requirements.

10.3.1.3 Followed by a 30 mil self-adhesive membrane composed of SBS modified bitumen and a tri-laminated woven polyethylene facer. The underface is covered with a silicone release film. Ensure all surfaces receiving membrane are primed.

10.3.1.4 Followed by 25mm polyisocyanurate insulation in low rise foam adhesive.

10.3.1.5 Followed by 1% tapered polyisocyanurate insulation as per wind uplift requirements in low rise foam adhesive.

10.3.1.6 Followed by 6mm asphaltic core board as per wind uplift requirements in low rise foam adhesive.

10.3.1.7 Followed by the new roof membrane assembly.

10.3.1.7.1 Sumps to be 8'x8' and tapered at 2% slope o.c.

10.3.2 Pitch Pocket Sealer - 100% solids, self-leveling, polyurethane sealant for filling pitch pans as recommended and furnished by the membrane manufacturer.

10.3.2.1 Durometer, ASTM D 2240: 40-50 Shore

10.3.2.2 Elongation, ASTM D 412: 250%

10.3.2.3 Tensile Strength, ASTM D 412: 200 @ 100 mil

10.3.3 Flashing Boot - Rubbertite Flashing Boot: Neoprene pipe boot for sealing single or multiple pipe penetrations adhered in approved adhesives as recommended and furnished by the membrane manufacturer.

10.3.4 Vents and Breathers: Heavy gauge aluminum and fully insulated vent that allows moisture and air to escape but not enter the roof system as recommended and furnished by the membrane manufacturer.

10.3.5 Pitch pans with umbrella, Rain Collar 24 gauge stainless or 20oz (567gram) copper. All joints should be welded/soldered watertight. See details for design.

10.3.6 Drains to be retrofitted with U-flow drains or equivalent. Metal drain grate included.

10.3.7 Plumbing stacks should be 4lb (1.8kg) sheet lead formed and rolled.

11 EXECUTION

11.1 EXAMINATION

11.1.1 Do not begin installation until substrates have been properly prepared.

11.1.2 Inspect and approve the deck condition, slopes and fastener backing if applicable, parapet walls, expansion joints, roof drains, stack vents, vent outlets, nailers and surfaces and elements.

- 11.1.3 Verify that work penetrating the roof deck, or which may otherwise affect the roofing, has been properly completed.
- 11.1.4 Check the underside of the deck for any services and fasten without damaging the services on the underside.
- 11.1.5 If substrate preparation and other conditions are the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.

11.2 PREPARATION

- 11.2.1 Remove and dispose of existing heat tracer cable.
- 11.2.2 General: Clean surfaces thoroughly prior to installation.
 - 11.2.2.1 Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.
 - 11.2.2.2 Fill substrate surface voids that are greater than 1/4 inch wide with an acceptable fill material.
 - 11.2.2.3 Roof surface to receive roofing system shall be smooth, clean, free from loose gravel, dirt and debris, dry and structurally sound.
 - 11.2.2.4 Wherever necessary, all surfaces to receive roofing materials shall be power broom and vacuumed to remove debris and loose matter prior to starting work.
 - 11.2.2.5 Do not apply roofing during inclement weather. Do not apply roofing membrane to damp, frozen, dirty, or dusty surfaces.
 - 11.2.2.6 Fasteners and plates for fastening components mechanically to the substrate shall provide a minimum pull-out capacity of 300 lbs. (136 k) per fastener. Base or ply sheets attached with cap nails require a minimum pullout capacity of 40 lb. per nail.
 - 11.2.2.7 Prime decks where required, in accordance with requirements and recommendations of the primer and deck manufacturer.
- 11.2.3 Metal Deck: Metal deck shall be installed as specified in Section
 - 11.2.3.1 Fastening of the deck should comply with the anticipated live and dead loads pertaining to the building as well as applicable Code.
 - 11.2.3.2 Steel decks shall be minimum 22-gauge factory galvanized or zinc alloy coated for protection against corrosion.
 - 11.2.3.3 Suitable insulation shall be mechanically attached as recommended by the insulation manufacturer.
 - 11.2.3.4 When re-roofing over steel decks, surface corrosion shall be removed, and repairs to severely corroded areas made. Loose or inadequately secured decking shall be fastened, and irreparable or otherwise defective decking shall be replaced.
- 11.2.4 Re-Roofing Applications:
 - 11.2.4.1 Remove existing roof flashings from curbs and parapet walls down to the surface of the roof. Remove existing flashings at roof drains and roof penetrations.
 - 11.2.4.2 Remove all wet, deteriorated, blistered or delaminated roofing membrane or insulation and fill in any low spots occurring as a result of removal work to

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create a smooth, even surface for application of new roof membranes.

- 11.2.4.3 Install new wood nailers as necessary to accommodate insulation/recovery board or new nailing patterns.
- 11.2.4.4 When mechanically attached, the fastening pattern for the insulation/recovery board shall be as recommended by the specific product manufacturer.
- 11.2.4.5 Existing roof surfaces shall be primed as necessary with asphalt primer meeting ASTM D 41 and allowed to dry prior to installing the roofing system.

11.3 INSTALLATION – GENERAL

11.4 Install the new roof membrane flashings at the transition to steep sloped roofs leading up the sloped area 20" minimum. When replacing the sloped roof area, install the new underlayment leading down onto the new roof flashings 10" minimum in shingle fashion. Ensure the roof flashings are back nailed as required and stripped in with 6" wide minimum membrane over each fastener.

11.4.1 Install modified bitumen membranes and flashings in accordance with manufacturer's instructions and with the recommendations provided by the National Roofing Contractors Association's Roofing & Waterproofing Manual, the Asphalt Roofing Manufacturers Association, and applicable codes.

11.4.2 General: Avoid installation of modified bitumen membranes at temperatures lower than 40-45 degrees F. When work at such temperatures unavoidable use the following precautions:

11.4.2.1 Take extra care during cold weather installation and when ambient temperatures are affected by wind or humidity, to ensure adequate bonding is achieved between the surfaces to be joined. Use extra care at material seam welds and where adhesion of the applied product to the appropriately prepared substrate as the substrate can be affected by such temperature constraints as well.

11.4.2.2 Unrolling of cold materials, under low ambient conditions must be avoided to prevent the likelihood of unnecessary stress cracking. Rolls must be at least 40 degrees F at the time of application. If the membrane roll becomes stiff or difficult to install, it must be replaced with roll from a heated storage area.

11.4.3 Commence installation of the roofing system at the lowest point of the roof (or roof area), working up the slope toward the highest point. Lap sheets shingle fashion so as to constantly shed water

11.4.4 All slopes greater than 2:12 require back-nailing to prevent slippage of the ply sheets. Use ring or spiral-shank 1 inch cap nails, or screws and plates at a rate of 1 fastener per ply (including the membrane) at each insulation stop. Place insulation stops at 16 ft o.c. for slopes less than 3:12 and 4 feet o.c. for slopes greater than 3:12. On non-insulated systems, nail each ply directly into the deck at the rate specified above. When slope exceeds 2:12, install all plies parallel to the slope (strapping) to facilitate backnailing. Install 4 additional fasteners at the upper edge of the membrane when strapping the plies.

11.5 INSTALLATION HOT APPLIED ROOF SYSTEM

11.5.1 Base Ply: Cut base ply sheets into 18 foot lengths and allow plies to relax before

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- installing. Install base sheet in Interply Adhesive: applied at the rate required by the manufacturer. Shingle base sheets uniformly to achieve one ply throughout over the prepared substrate. Shingle in proper direction to shed water on each large area of roofing.
- 11.5.1.1 Lap ply sheet ends 8 inches. Stagger end laps 12 inches minimum.
 - 11.5.1.2 Solidly bond to the substrate and adjacent ply with specified adhesive. Roll must push a puddle of adhesive in front of it with adhesive slightly visible at all side laps. Use care to eliminate air entrapment under the membrane.
 - 11.5.1.3 Install subsequent rolls of modified across the roof as above with a minimum of 4 inch side laps and 8 inch staggered end laps. Lay modified membrane in the same direction as the underlayers but the laps shall not coincide with the laps of the base layers.
 - 11.5.1.4 Extend plies 2 inches beyond top edges of cants at wall and projection bases.
 - 11.5.1.5 Install base flashing ply to all perimeter and projection details.
 - 11.5.1.6 Allow the one ply of base sheet to cure at least 30 minutes before installing the modified membrane. However, the modified membrane must be installed the same day as the base plies.
- 11.5.2 Modified Cap Ply(s): Cut cap ply sheets into 18 foot lengths and allow plies to relax before installing. Install in interplay adhesive applied at the rate required by the manufacturer. Shingle sheets uniformly over the prepared substrate to achieve the number of plies specified. Shingle in proper direction to shed water on each large area of roofing.
- 11.5.2.1 Lap ply sheet ends 8 inches. Stagger end laps 12 inches minimum.
 - 11.5.2.2 Solidly bond to the base layers with specified adhesive. Roll must push a puddle of adhesive in front of it with adhesive slightly visible at all side laps. Care should be taken to eliminate air entrapment under the membrane.
 - 11.5.2.3 Install subsequent rolls of modified across the roof as above with a minimum of 4 inch side laps and 8 inch staggered end laps. Lay modified membrane in the same direction as the underlayers but the laps shall not coincide with the laps of the base layers.
 - 11.5.2.4 Extend membrane 2 inches beyond top edge of all cants in full moppings of the adhesive as shown on the Drawings.
- 11.5.3 Fibrous Cant Strips: Provide non-combustible perlite or glass fiber cant strips at all wall/curb detail treatments where angle changes are greater than 45 degrees. Cant may be set in approved cold adhesives, hot asphalt or mechanically attached with approved plates and fasteners.
- 11.5.4 Wood Blocking, Nailers and Cant Strips: Provide wood blocking, nailers and cant strips as specified in Section 06114.
- 11.5.4.1 Provide nailers at all roof perimeters and penetrations for fastening membrane flashings and sheet metal components.
 - 11.5.4.2 Wood nailers should match the height of any insulation, providing a smooth and even transition between flashing and insulation areas.
 - 11.5.4.3 Nailer lengths should be spaced with a minimum 1/8 inch gap for expansion and contraction between each length or change of direction.
 - 11.5.4.4 Nailers and flashings should be fastened in accordance with Factory Mutual "Loss Prevention Data Sheet 1- 49, Perimeter Flashing" and be designed to be capable of resisting a minimum force of 200 lbs/lineal foot in any direction.

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- 11.5.5 Metal Work: Provide metal flashings, counter flashings, parapet coping caps and thru-wall flashings as specified in Section 07620 or Section 07710. Install in accordance with the SMACNA "Architectural Sheet Metal Manual" or the CRCA Roofing Waterproofing manual.
- 11.5.6 Termination Bar: Provide a metal termination bar or approved top edge securement at the terminus of all flashing sheets at walls and curbs. Fasten the bar a minimum of 8 inches (203 mm) o/c to achieve constant compression. Provide suitable, sealant at the top edge if required.
- 11.5.7 Flashing Base Ply: Install flashing sheets by the same application method used for the base ply.
- 11.5.7.1 Seal curb, wall and parapet flashings with an application of mastic and mesh on a daily basis. Do not permit conditions to exist that will allow moisture to enter behind, around or under the roof or flashing membrane.
 - 11.5.7.2 Prepare all walls, penetrations, expansion joints and where shown on the Drawings to be flashed with required primer at the rate of 100 square feet per gallon. Allow primer to dry tack free.
 - 11.5.7.3 Adhere to the underlying base ply with specified flashing ply adhesive unless otherwise specified. Nail off at a minimum of 8 inches (203 mm) o.c. from the finished roof at all vertical surfaces.
 - 11.5.7.4 Solidly adhere the entire flashing ply to the substrate. Secure the tops of all flashings that are not run up and over curb through termination bar fastened at 6 inches (152 mm) O.C. and sealed at top.
 - 11.5.7.5 Seal all vertical laps of flashing ply with a three-course application of trowel-grade mastic and fiberglass mesh.
 - 11.5.7.6 Coordinate counter flashing, cap flashings, expansion joints and similar work with modified bitumen roofing work as specified.
 - 11.5.7.7 Coordinate roof accessories, miscellaneous sheet metal accessory items, including piping vents and other devices with the roofing system work.
 - 11.5.7.8 Secure the top edge of the flashing sheet using a termination bar only when the wall surface above is waterproofed, or nailed 4 inches on center and covered with an acceptable counter flashing.
- 11.5.8 Flashing Cap Ply:
- 11.5.8.1 Seal curb, wall and parapet flashings with an application of mastic and mesh on a daily basis. Do not permit conditions to exist that will allow moisture to enter behind, around or under the roof or flashing membrane.
 - 11.5.8.2 Prepare all walls, penetrations, expansion joints and where shown on the Drawings to be flashed with required primer at the rate of 100 square feet per gallon. Allow primer to dry tack free.
 - 11.5.8.3 Adhere to the underlying base flashing ply with specified flashing ply adhesive unless otherwise specified. Nail off at a minimum of 8 inches (203 mm) o.c. from the finished roof at all vertical surfaces.
 - 11.5.8.4 Coordinate counter flashing, cap flashings, expansion joints and similar work with modified bitumen roofing work as specified.
 - 11.5.8.5 Coordinate roof accessories, miscellaneous sheet metal accessory items with the roofing system work.
 - 11.5.8.6 All stripping shall be installed prior to flashing cap sheet installation.
 - 11.5.8.7 Heat and scrape granules when welding or adhering at cut areas and seams to

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- granular surfaces at all flashings.
 - 11.5.8.8 Secure the top edge of the flashing sheet using a termination bar only when the wall surface above is waterproofed, or nailed 4 inches on center and covered with an acceptable counter flashing.
 - 11.5.9 Flood Coat/Aggregate:
 - 11.5.9.1 Install after cap sheets and modified flashing, tests, repairs and corrective actions have been completed and approved.
 - 11.5.9.2 Apply flood coat materials in the quantities recommended by the manufacturer.
 - 11.5.9.3 Uniformly embed aggregate in the flood coat of cold adhesive at a rate recommended by the manufacturer.
 - 11.5.9.4 Aggregate must be dry and placed in a manner required to form a compact, embedded overlay. To aid in embedment, lightly roll aggregate.
 - 11.5.10 Roof Walkways: Provide walkways in areas indicated on the Drawings.
- ### 11.6 INSTALLATION EDGE TREATMENT AND ROOF PENETRATION FLASHING
- 11.6.1 Fabricated Flashings: Fabricated flashings and trim are provided as specified in Section 07620.
 - 11.6.1.1 Fabricated flashings and trim shall conform to the detail requirements of SMACNA "Architectural Sheet Metal Manual" and/or the Copper Development Association "Copper in Architecture - Handbook" as applicable.
 - 11.6.2 Surface Mounted Counterflashing:
 - 11.6.2.1 Minimum flashing height is 8 inches (203 mm) above finished roof height. Maximum flashing height is 24 inches (609 mm). Prime vertical wall at a rate of 100 square feet per gallon and allow to dry.
 - 11.6.2.2 Set cant in bitumen. Run all field plies over cant a minimum of 2 inches (50 mm).
 - 11.6.2.3 Install base flashing ply covering wall set in bitumen with 6 inches (152 mm) on to field of the roof.
 - 11.6.2.4 Install a second ply of modified flashing ply in bitumen over the base flashing ply, 9 inches (228 mm) on to the field of the roof. Apply a three-course application of mastic and mesh at all vertical seams and allow to cure and aluminize.
 - 11.6.2.5 Apply butyl tape to wall behind flashing. Secure termination bar through flashing, butyl tape and into wall. Alternatively use caulk to replace the butyl tape.
 - 11.6.2.6 Secure counterflashing set on butyl tape above flashing at 8 inches (203 mm) o.c. and caulk top of counterflashing.
 - 11.6.3 Roof Drain: U-flow retrofit drains to be installed.
 - 11.6.3.1 Plug drain to prevent debris from entering plumbing.
 - 11.6.3.2 Taper insulation to drain minimum of (1200 mm) from center of drain.
 - 11.6.3.3 Run roof system plies over drain. Cut out plies inside drain bowl.
 - 11.6.3.4 Set lead/copper flashing (30 inch square minimum) in 1/4 inch bed of mastic. Run lead/copper into drain a minimum of 2 inches (50 mm). Prime lead/copper

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at a rate of 100 square feet per gallon and allow to dry.

- 11.6.3.5 Install base flashing ply (40 inch square minimum) in bitumen.
- 11.6.3.6 Install modified membrane (48 inch square minimum) in bitumen.
- 11.6.3.7 Install clamping ring and assure that all plies are under the clamping ring.
- 11.6.3.8 Remove drain plug and install strainer.

11.6.4 Plumbing Stack:

- 11.6.4.1 Minimum stack height is 12 inches (609 mm).
- 11.6.4.2 Run roof system over the entire surface of the roof. Seal the base of the stack with elastomeric sealant.
- 11.6.4.3 Prime flange of new sleeve. Install properly sized sleeves set in 1/4 inch (6 mm) bed of roof cement.
- 11.6.4.4 Install base flashing ply in bitumen.
- 11.6.4.5 Install membrane in bitumen.
- 11.6.4.6 Caulk the intersection of the membrane with elastomeric sealant.
- 11.6.4.7 Turn sleeve a minimum of 1 inch (25 mm) down inside of stack.

11.6.5 Pitch Pocket Umbrella:

- 11.6.5.1 Run all plies up to the penetration.
- 11.6.5.2 Place the pitch pocket over the penetration and prime all flanges.
- 11.6.5.3 Strip in flange of pitch pocket with one ply of base flashing ply. Extend 6 inches (152 mm) onto field of roof.
- 11.6.5.4 Install second layer of modified membrane extending 9 inches (228 mm) onto field of the roof.
- 11.6.5.5 Fill pitch pocket half full with non-shrink grout. Let this cure and top off with pourable sealant.
- 11.6.5.6 Caulk joint between roof system and pitch pocket with roof cement.
- 11.6.5.7 Place a watershedding type bonnet over the top of the pitch pocket and clamp the top with a drawband collar. Caulk the upper edge of the band with an elastomeric sealant.

11.7 CLEANING

- 11.7.1 Clean-up and remove daily from the site all wrappings, empty containers, paper, loose particles and other debris resulting from these operations.
- 11.7.2 Remove asphalt markings from finished surfaces.
- 11.7.3 Repair or replace defaced or disfigured finishes caused by Work of this section.

11.8 PROTECTION

- 11.8.1 Provide traffic ways, erect barriers, fences, guards, rails, enclosures, chutes and the like to protect personnel, roofs and structures, vehicles and utilities.
- 11.8.2 Protect exposed surfaces of finished walls with tarps to prevent damage.
- 11.8.3 Plywood for traffic ways required for material movement over existing roofs shall be not less than 5/8 inch (16 mm) thick.
- 11.8.4 In addition to the plywood listed above, an underlayment of minimum 1/2 inch (13 mm)

recover board is required on new roofing.

- 11.8.5 Special permission shall be obtained from the Manufacturer before any traffic shall be permitted over new roofing.

11.9 FIELD QUALITY CONTROL

- 11.9.1 Inspection: Provide manufacturer's field observations daily during progress until completion. Provide a final inspection upon completion of the Work.

- 11.9.1.1 Warranty shall be issued upon manufacturer's acceptance of the installation.

- 11.9.1.2 Field observations shall be performed by a Sales Representative employed full-time by the manufacturer and whose primary job description is to assist, inspect and approve membrane installations for the manufacturer.

- 11.9.1.3 Provide observation reports from the Sales Representative indicating procedures followed, weather conditions and any discrepancies found during inspection.

- 11.9.1.4 Provide a final report from the Sales Representative, certifying that the roofing system has been satisfactorily installed according to the project specifications, approved details and good general roofing practice.

END OF SECTION