

1 General

1.1 RELATED WORK

- .1 The contractor shall confirm acceptability of the metal deck drainage profile before installation of the new sheathing.

1.2 ALTERNATES

- .1 Requests for alternates must be submitted in accordance with B6.

1.3 REFERENCE STANDARD(S)

- .1 Submit a report , issued by a certified materials testing laboratory, attesting that the roofing system offered, was tested in accordance with CSA A 123.21-04, Standard Test Method for Dynamic Wind Uplift Resistance of Mechanically Attached Membrane Roofing Systems. Test results shall demonstrate the roofing system sustained wind uplift pressures of 1.0 kPa for the field of the roof, 1.2 kPa for the edge of the roof, and 1.7 kPa for the corners of the roof.
- .2 Roofing and sheet metal Work will be performed in conformance with the roofing manufacturer's written recommendations as well as the requirements of the ULC laboratories Class A.
- .3 Submit a document issued by the CSA certifying that the roofing system offered meets the requirements of CAN/ULC-S107-03 "Standard Methods of Fire Tests of Roof Coverings Class C."
- .4 CSA A123.4-04, Asphalt for Constructing Built-Up Roof Coverings and Waterproofing Systems.
- .5 Prefabricated membrane, complies with CAN/CGSB 37.56-M -1985, Membrane Modified, Bituminous, Prefabricated, and Reinforced for Roofing.
- .6 CAN/ULC-S702-97 Thermal Insulation, Mineral Fibre, Boards for Buildings.
- .7 CAN/ULC-S704-2001 Thermal Insulation, Polyurethane and Polyisocyanurate, Boards, Fixed.

1.4 COMPATIBILITY

- .1 All waterproofing materials will be provided by the same manufacturer.

1.5 TECHNICAL DOCUMENTS

- .1 Submit two (2) copies of the most current technical data sheets. These documents must describe the materials' physical properties , and explanations about product installation, including installation techniques, restrictions, limitations and other manufacturer recommendations.

1.6 SHOP DRAWINGS

- .1 Submit shop drawings in conformance with Section 1300 requirements.
- .2 Provide details of flashing and sloped insulation. Insulation to provide 2" back slope over two foot projection at all terminations and penetrations.
- .3 Submit drawings locating and identifying sloped insulation blocks.

- .4 Mechanical anchorage of insulation to Global FM I-90 of insulation around perimeters and corners is required and is to also be shown on the shop drawings.

1.7 QUALITY ASSURANCE AND ENVIRONMENTAL MANAGEMENT

- .1 The manufacturer of elastomeric bitumen products will provide proof of ISO 9001 and ISO 14001 Certifications.

1.8 CONTRACTOR QUALIFICATION

- .1 Roofing contractors and sub-contractors must, when tendering or performing Work, possess a roofing contractor operating license.
- .2 Roofing contractors and sub-contractors must also be registered with SOPREMA's PAQ + S program and provide the architect with a SOPREMA certificate to this effect before beginning any roofing Work.
- .3 Only qualified, certified installers employed by a company with the appropriate equipment may execute the roofing Work.
- .4 Roofing contractors and sub-contractors must also be members of RCAM and NRCA and provide the Contract Administrator with a certificate to this effect before beginning any roofing Work.
- .5 Contractor may switch roofing foreman through project only upon written permission of Contract Administrator and only after suitable overlap to facilitate transfer of knowledge.

1.9 MANUFACTURER'S REPRESENTATIVE

- .1 The roofing product manufacturer can delegate a representative to visit the Work Site at the start of roofing installation.
- .2 The contractor must at all times enable and facilitate access to the Work Site by said representative.

1.10 INSPECTION

- .1 Roofing installation inspection will be done by the Contract Administrator and/or a testing agency designated by the Contract Administrator.
- .2 All roof inspection fees by the inspector will be paid by the Cash Allowance. These inspections will not be replacing the Site inspections performed by the Contract Administrator.
- .3 All inspections by others including but not limited to authority having jurisdiction shall be paid for by the Contractor.

1.11 PRE-INSTALLATION MEETING

- .1 Hold a pre-installation meeting prior to start of waterproofing Works, with the roofing contractor's representative, the Contract Administrator and the City of Winnipeg. The purpose of this meeting is to review installation conditions particular to each project. Establish a report for this meeting.

1.12 STORAGE AND DELIVERY

- .1 All materials will be delivered and stored in conformance with the requirements described in the SOPREMA Manual; they must remain in their original packaging, displaying the manufacturer's name, product name, weight, and reference standards, as well as all other indications or references considered standard.
- .2 At all times, materials will be adequately protected and stored in a dry and properly ventilated area, away from any welding flame or spark and sheltered from the elements or any harmful substance. Only materials destined for same-day use can be removed from this storage area. In cold weather, these materials should be stored in a heated area at a minimum temperature of +10⁰C and removed prior to application. If rolls cannot be stored in a heated environment, they may be pre-conditioned before installation. For precise description, please consult SOPREMA'S "Roofers' Guide" on membrane application procedures.
- .3 Store adhesives and emulsion-based waterproofing mastics at a minimum +5⁰C. Store adhesives and solvent-based mastics at sufficient temperatures to ensure ease of application.
- .4 Materials delivered in rolls will be carefully stored upright; flashing will be stored to avoid creasing, buckling, scratches or any other possible damage.
- .5 Avoid material overloads which may affect the structural integrity of specific roof areas.

1.13 FIRE PROTECTION

- .1 Prior to the start of Work, conduct a Site inspection to establish safe Working practices and make sure that all procedures and proposed changes are approved to minimize the risk of fires.
- .2 Respect safety measures described in the SOPREMA Specifications Manual as well as local association recommendations.
- .3 At the end of each Workday, use a heat detector gun to spot any smouldering or concealed fire. Job planning must be organized to ensure Workers are still on location at least one hour after torch application.
- .4 Never apply the torch directly to old and wood surfaces.
- .5 Throughout roofing installation, maintain a clean Site and have one approved ABC fire extinguisher within 6 metres of each roofing torch. Respect all safety measures described in technical data sheets. Torches must never be placed near combustible or flammable products. Torches should never be used where the flame is not visible or cannot be easily controlled.
- .6 A four hour fire watch is to be implemented following all periods of torching, commencing upon the point where torches are extinguished for the day.

1.14 WARRANTIES

- .1 The membrane manufacturer will issue a written document in the City of Winnipeg's name, valid for a 10 -year period, saying that it will repair any leaks in the roofing membrane to restore the roofing system to a dry and watertight condition, to the extent that membrane manufacturing or installation defects caused water infiltration. The warranty must cover for the entire cost of the repair(s) during the entire warranty period. The warranty must be transferable, at no extra cost, to subsequent building City of Winnipeg. The contractor will issue a written and signed document in the City of

Winnipeg's name, certifying that the Work executed will remain in place and free of any Workmanship defect for a period of 10 years, starting from the date of acceptance.

- .2 The product manufacturer will issue a written and signed document in the City of Winnipeg's name, certifying that the roofing membranes are free of manufacturing defects for a period of ten (10) years, starting from the date of acceptance. This warranty will cover the removal and replacement of defective roof membrane products, including labour. The warranty must remain a full warranty for the duration of the period specified. No letter amending the manufacturer's standard warranty will be accepted and the warranty certificate must reflect these requirements.

2 Products

2.1 VAPOUR RETARDER SUPPORT PANELS

- .1 Deck board sheathing: Fiber reinforced moisture resistant sheathing: Dens Deck anchored to the steel deck in accordance with Global FM I90 requirements.

2.2 AIR BARRIER/VAPOUR RETARDER

- .1 Torch Grade Membrane:
 - .1 Description: Torch-On glass mat reinforced SBS modified bitumen membrane, 2.2 mm thick.
 - .2 Specified product: Elastophene Flam 2.2.
 - .3 Manufacturer's recommended primer will be mandatory.

2.3 INSULATION

- .1 Expanded polystyrene insulation; SLOPE, only and located around the perimeter and all terminations. Maximum 2" thick tapering to 0" over two feet.
- .2 Polyisocyanurate insulation:
 - .1 Description: closed-cell polyisocyanurate foam core integrally laminated between two heavy coated-glass facers, tan in colour. These facers shall be saturated with a coating that provides a smooth, consistent surface, free of loose fibres.
 - .2 Insulation to be provided in two layers: bottom to consist of 3.3 inches; top layer 1.5 inches providing R28 to roof system.
 - .3 Specified product: **COLGRIP A** by SOPREMA
 - .4 Insulation on all steep slope areas are to be anchored using five anchors per board. Anchors to consist of Number 14 corrosion resistant, black coated screws penetrating metal deck flutes. Anchors to be 6" from edges and one located in the centre.
 - .5 Liquid membrane component to seal screw holes.

2.4 MEMBRANE SYSTEMS

- .1 COLVENT system (semi-independent self-adhesive base sheet)
 - .1 Description: Waterproofing system composed of glass mat reinforced and SBS modified bitumen membranes with a semi-independent, self-adhesive base sheet and a

heat-welded cap sheet. The top surface of the base sheet is covered with a thermofusible plastic film and must have three distinctive blue lines to facilitate roll alignment. The cap sheet underface is covered with a thermofusible plastic film and the top face is protected by coloured granules

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|----|--------------------------------------------------------------------|-------------|--------|
| .2 | System properties: | MD | XD |
| .1 | Strain energy (kN/m) | [9.4] | [9.2] |
| .2 | Breaking strength (N/5 cm) | [19.2] | [16.3] |
| .3 | Ultimate elongation (%) | [54] | [62] |
| .4 | Cold bending at -30°C | No cracking | |
| .5 | Softening point | ≥ 110°C | |
| .6 | Static puncture (N) | [380] | |
| .3 | Prefabricated membrane, complies with CAN/CGSB 37.56-M (9th draft) | | |
| .4 | Specified products | | |
| .1 | Base sheet membrane: COLVENT BASE 810 by SOPREMA | | |
| .2 | Cap sheet: COLVENT TRAFFIC CAP-860 by SOPREMA | | |
- .2 UPSTAND SYSTEM self-adhesive base sheet
- .1 Description: Membrane flashing shall be two plies of reinforced modified bitumen membrane and the base sheet shall be self-adhesive. The top surface of the base sheet is covered with a thermofusible plastic film and the bottom surface is protected by silicone release paper. The cap sheet underface is covered with a thermofusible plastic film and the top face is protected by coloured granules white slate specks.
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|----|-----------------------------------------------------------------------------------------------------------------------------|----------------------|-----|
| .2 | System properties:Regular | MD | XD |
| .1 | Strain energy (kN/m) | 8.4 | 8.3 |
| .2 | Breaking strength (N/5 cm) | 18 | 16 |
| .3 | Ultimate elongation (%) | 55 | 56 |
| .4 | Tear resistance (N) | 120 | |
| .5 | Static puncture (N) | 380 | |
| .6 | Dimensional stability (%) | 0.1 | 0.4 |
| .7 | Plastic flow (°C) | 105 | |
| .8 | Cold bending (at -30°C) | -initial No cracking | |
| .9 | -90 days at 70°C No cracking | | |
| .3 | Prefabricated membrane, complies with CAN/CGSB 37.56-M (9th draft) | | |
| .4 | Specified products | | |
| .1 | Base sheet flashing membrane SOPRAFLASH FLAM STICK from SOPREMA | | |
| .2 | Cap sheet flashing cap sheet membrane TRAFFIC CAP in the 400 to 800 series by SOPREMA, as specified/recommended by SOPREMA. | | |
| .5 | Colour of membrane: Grey. Provide samples to City of Winnipeg in advance of installation. | | |

2.5 ACCESSORY MEMBRANES

- .1 Reinforcement membrane:

- .1 Description: Roofing membrane with compoSite heavy glass mat reinforced and SBS modified bitumen. Both sides are covered with a thermofusible plastic film. The top face must be marked with three (3) distinctive blue chalk lines to ensure proper roll alignment.
 - .2 Prefabricated membrane, complies with CAN/CGSB 37.56-M (9th draft)
 - .3 Specified product(s): SOPRAFLASH FLAM STICK by SOPREMA.
- 2 Cover Strip
- .1 Description: Membrane strip 330 mm made of SBS modified bitumen and compoSite elastomeric bitumen reinforcement. Both faces are covered with a plastic thermofusible film. The strip ensures water-tightness in the end laps.
 - .2 Specified product: SOPRALAP (for thermofusible surfaces) from SOPREMA.
- .3 Flexible membrane for expansion joints:
- .1 Description: Waterproofing membrane manufactured by combining a polyester fabric with SBS modified bitumen and a root-repelling agent. The underface is covered with a thermofusible plastic film. The top face has an aluminum foil adhered to the centre of the membrane and is covered by a protective silicone paper to be removed during application. Nominal thickness is 4.0 mm. and width of 450 mm.
 - .2 Components: Polyester fabric, thermofusible elastomeric bitumen, silicone paper, and aluminum sheathing (width = 0.20 m.).
 - .3 Properties:
 - .1 Strength at 10% elongation: 5 N/cm
 - .2 Strength at rupture: 250 N/cm
 - .3 Elongation at rupture: 120%
 - .4 Elongation at rupture at -20⁰C: 100%
 - .5 Low temperature flexibility: -30⁰C
 - .6 Elasticity limit: 40%
 - .7 Fatigue resistance: 1000 cycles.
 - .4 Specified product: SOPRAJOINT membrane by SOPREMA.

2.6 PRIMER

- .1 Primer for self-adhesive membranes
 - .1 Description: ELASTOCOL STICK: Composed of SBS synthetic rubber, volatile solvents, adhesive enhancing resins and volatile solvent used to prime porous substrates and non-porous substrates such as wood, concrete or metal to enhance the adhesion of self-adhesive membranes at temperatures above - 10°C.
 - .2 Specified product: ELASTOCOL STICK by SOPREMA.
 - .3 Description: Polymeric emulsion finish designed to improve adherence of self-adhesive waterproofing membranes when solvent-based primer is not recommended.
 - .4 Specified product: SOPREMA ELASTOCOL STICK H²O

2.7 ADHESIVES

- .1 Insulation adhesive:

- .1 Description: A highly elastomeric, two components, one step, all purpose, foamable adhesive that contains no solvents and sets in minutes.
- .2 Specified product : DUOTACK by SOPREMA

2.8 FLAME-STOP MEMBRANE

- .1 Description: Self-adhesive membrane composed of a reinforced glass mat and SBS modified bitumen designed to prevent flames from penetrating into empty spaces and openings while installing heat-welded membranes.
- .2 Specified products: SOPRAGUARD tape by SOPREMA

2.9 FASTENERS

- .1 Membrane and insulation fasteners
 - .1 Description: #14 Phillips pre-assembled hot-dipped galvanized mechanical fasteners made case-hardened carbon steel that comply with FMR approval standards. 50 mm. diameter, barbed stress plates that comply with the CSA B35.3 and FM 4470 approval standard.
 - .2 Specified products: SOPRAFX FASTENERS/PLATES by SOPREMA as approved by FM-I90 for the specified system.
- .2 Insulation fasteners
 - .1 Description: No. 14 hot-dipped galvanized screws c/w 50 mm metal washers.
 - .2 Screws installed into metal deck to be No.14 Teks screws suitable for metal deck anchorage. Screws must go through deck and into the deck flute and be coated black.
 - .3 All fasteners which penetrate the air barrier membrane are to be dipped in manufacturer compatible membrane prior to insertion.

2.10 COMPLEMENTARY WATERPROOFING PRODUCTS

- .1 Waterproofing mastic:
 - .1 Description: Mastic made of synthetic rubbers, plasticized with bitumen and solvents. Aluminum pigments are added to SOPRAMASTIC ALU to provide greater resistance to U.-V.
 - .2 Specified product: SOPRAMASTIC [ALU] by SOPREMA.
- .2 Pitch pocket filler:
 - .1 Description: Pre-engineered box/liquid membrane filler aluminum coloured solvent-based mastic containing superior grade bitumen modified with SBS synthetic rubber and fibres. Designed for pitch box filling.
 - .2 Specified product: INTERCLIP FILLER by SOPREMA.
- .3 Sealing product
 - .1 Description: Composed of a bitumen/polyurethane waterproofing mono-component and polyester reinforcements. Designed to finish upstands and details. (no-flame installation).
 - .2 Specified product: ALSAN FLASHING by SOPREMA

2.11 ROOF WALKWAYS

- .1 Description: Waterproofing membrane composed of SBS modified bitumen and unwoven polyester reinforcement. The top face is covered with black granules; the underface is protected by a thermofusible film.
- .2 Specified product: SOPRAWALK Membrane by SOPREMA

3 EXECUTION

3.1 SURFACE EXAMINATION AND PREPARATION

- .1 Surface examination and preparation must be completed in conformance with recommendations in the SOPREMA Specifications Manual, particularly for fire safety precautions.
- .2 Before roofing Work begins, the Contract Administrator and roofing foreman will inspect and approve deck conditions (including slopes and wood blocking) as well as upstands and parapets, construction joints, roof drains, plumbing vents, ventilation outlets and others. If necessary, a non-conformity notice will be issued to the contractor so that required corrections can be made. The start of roofing Work will mean roofing conditions are acceptable for Work completion.
- .3 Do not begin any Work before surfaces are smooth, dry, and free of ice and debris. Use of calcium or salt is forbidden for ice or snow removal.
- .4 Be sure plumbing, carpentry and all other Work has been duly completed.
- .5 No materials will be installed during rain or snowfall.
- .6 Concrete topping must be chain dragged for areas of debonding. Debonded areas will be removed and replaced at unit prices for concrete repair.

3.2 METHOD OF INSTALLATION

- .1 Prepare surfaces and complete waterproofing Work in conformance with SOPREMA'S requirements, and the "Roofers' Guide".
- .2 Complete removal of any debris/matter which may impact the installation of the membrane.
- .3 Install roofing elements on clean and dry surfaces, in conformance with manufacturer's instructions and recommendations.
- .4 Roofing Work must be completed in a continuous fashion as surfaces are readied and weather conditions permit.
- .5 It's preferable to seal all seams that are not covered by a cap sheet membrane in the same day. The cap sheet cannot be installed if any moisture is present at/in the base sheet seams.
- .6 Whenever membranes are torch-applied, a continuous and even bead of molten bitumen must be visible as the membrane is unrolled and torched.
- .7 Ensure waterproofing conditions for roofs at all times, including protection during installation Work by other trades and progressive protection as Work is completed (e.g. vents, drains, etc.).
- .8 Complete all Work (temporary supports for equipment and bases, disconnection and connection of equipment as needed, moving and lifting of bases, etc.) required for waterproofing beneath equipment and bases as shown on drawings; use qualified trade

persons as required. Temporary supports for waterproofing beneath air-conditioning units must be designed to hold supported loads and distribute these loads to avoid structural damage. Avoid interruption of functioning equipment during roofing. Unavoidable interruptions must be planned with the City of Winnipeg and may be scheduled outside normal Working hours.

3.3 SITE PROTECTION

- .1 Protect finished Work to avoid damage during roof installation and material transportation. Install protective boardwalks over installed roofing materials to enable passage of people and products. Assume full responsibility for any damage.
- .2 Ensure Site protection below deck is provided at all times. Any contamination from construction processes and/or precipitation must not be permitted to penetrate the areas below the roof deck. Complete environmental separation must be maintained at all times.

3.4 CLEANING

- .1 The Work Site must be routinely cleared of rubbish and other materials which may hinder roof installation, performance, or present a fire hazard.

3.5 EQUIPMENT FOR WORK EXECUTION

- .1 Maintain all roofing equipment and tools in good Working order.
- .2 Use torches recommended by SOPREMA

3.6 PREPARATION WORK - METAL DECKING

- .1 Install Dens Deck in accordance with manufacturer's specifications; incorporating requirements for screw size and spacing which conform to Global FM-I90 anchorage requirements.

3.7 PREPARATION WORK – CONCRETE DECK

- .1 Prepare the surfaces according to manufacturer's recommendation and additional requirements specified herein. Decks that are to be waterproofed with elastomeric membrane must possess a Concrete Surface Profile (CSP) of 3 to 5. (*CSP as per the International Concrete Repair Institute*). Sandblasting of the concrete will be mandatory.

3.8 VAPOUR BARRIER SUPPORT PANELS INSTALLATION ON STEEL DECK

- .1 These boards must be screwed carefully onto the steel deck's upper rib surfaces in conformance with Factory Mutual I-90 requirements, bulletin 1-28 for installation of boards to roof perimeters and corners, 1-90. Use a minimum of 9 hot-dipped galvanized screws and washers for each 1220 mm x 2440 mm board. Increase fasteners to 12 at corners and perimeter. Cut boards so edges rest on centre of upper ribs. Cut straight lines with adequate tools.
- .2 Where slopes change directions, cut boards cleanly. Avoid breaking boards to acquire deck form. Place boards perpendicular to deck ribs for continuous support at extremities.
- .3 Board joints will be staggered, in half-lengths, and perfectly butted. Joints will be sealed with heat-resistant tape in both directions to prevent any asphalt leakage in finished areas.

3.9 APPLICATION PRIMER

- .1 Roofing substrates of wood, metal, concrete, masonry or gypsum board surfaces will receive a coat of asphalt primer at a rate specified by manufacturer. All surfaces to be primed must be free of rust, dust or any residue that may hinder adherence. Cover primed surfaces with roofing membrane as soon as possible (same day coverage for self-adhesive membranes). Application temperature limit of +5°C for ELASTOCOL 350.

3.10 INSTALLATION OF AIR BARRIER AND VAPOUR RETARDER

- .1 The vapour retarder will be torch-applied onto the substrate in conformance with SOPREMA's written recommendations. Unroll vapour retarder membrane dry onto substrate for alignment purposes. Overlap side laps by 75 mm. and end laps by 150 mm. Laps shall be staggered a minimum of 300 mm.
- .2 Begin Work at bottom of slopes. Torch membrane so a visible bead of bitumen appears as the membrane is unrolled, ensuring the vapour retarder's complete adherence.
- .3 The primer must be dry when the vapour retarder is installed.
- .4 The roof vapour retarder must meet and overlap the air/vapour barrier on adjoining walls to ensure total continuity.
- .5 Dip all fasteners in liquid membrane prior to insertion to affect air seal at penetration.

3.11 INSULATION INSTALLATION

- .1 Apply insulation to vapour retarder or to adjoining board with specified adhesive applied in 2 cm. wide bands every 33 cm. OR in 10 cm. diameter spots 9 spots per square metre at a rate of 2 to 3 kg. per square metre.
- .2 Ensure air/vapour barrier membrane surface is dry and in accordance with manufacturer's requirements prior to application of insulation.
- .3 Attach insulation mechanically in conformance with manufacturer's recommendations, and Factory Mutual standards 1-90 pertaining to number and placement of fasteners, namely Bulletin 1-28 for fastening to roof perimeters and corners. Also see Factory Mutual requirements for "preliminary" anchoring of insulation where applicable. Fasteners must be attached to steel deck's upper flutes.
- .4 Insulation boards to receive 5 anchors at all steep slope areas all perimeters and corners, 6" from each edge and one in the centre.
- .5 Dip fasteners in liquid membrane compatible with roofing system prior to insertion to affect an air seal at air-barrier interface.
- .6 Use largest insulation sheets as possible when cutting.
- .7 Increase adhesive concentration at corners and perimeters in areas of high suction to ensure conformation to FM 1-90 requirements to supplement mechanical anchorage.
- .8 All vertical joints between level boards and sloped modules for the two rows of insulation board will be staggered.
- .9 Use a weighted roller to ensure continuous contact between insulation and air/vapour barrier membrane.
- .10 At gaps in the insulation, cut and adhere segments of rigid insulation as required to ensure full continuity in thermal barrier.
- .11 Install only as much insulation as can be covered in the same day.

3.12 INSTALLATION OF FLAME-STOP MEMBRANES

- .1 Adhere the membrane directly onto an approved substrate by peeling back the silicone release film. SOPRAGUARD TAPE is designed to prevent flames from penetrating into empty spaces and openings while installing heat-welded membranes.
- .2 Unroll the flame-stop membrane onto the insulation without adhering, being careful to overlap adjacent strips to ensure that the flame will not come in contact with the insulation.

3.13 INSTALLATION OF SELF-ADHESIVE SEMI-ADHERED BASE SHEET (COLVENT SYSTEM)

- .1 Beginning at the drains and perpendicular to the slope, install the base sheet membrane without adhering in parallel strips.
- .2 Each strip should overlap the preceding strip by 75 mm. along the side joint (use the blue line to facilitate alignment) and by 25 mm. at the ends. Because of the nature of this system, base sheet membrane joints can be aligned (no staggering) to facilitate the installation of the reinforcing band.
- .3 Let the membrane relax at least 15 minutes before installing it, or burn the plastic film in a zig-zag fashion using a propane torch to relax it. In cold weather, use the second method.
- .4 Peel back the silicone release paper to adhere the membrane to the substrate. Use a broom or brush to apply even pressure with a weighted roller to ensure good adherence.
- .5 Remove the paper protecting the selvedge [then heat the side joints. Seal the joints using a trowel. A bead of molten bitumen should appear along the joint to ensure a perfect seal.
- .6 Seal the end joints by welding a 300 mm. wide protection band centred on the joint.
- .7 For flame-free installations, seal the side joints and install a protection band over the end joints using COLPLY ADHESIVE TROWEL GRADE.
- .8 Avoid creating wrinkles, blisters, and fishmouths.
- .9 The base sheet membrane should end over the cant strip or at the edge of the substrate.
- .10 In order to comply with Global FM I-90 requirements, install No. 14 screws c/w 3" plate washers every 12 inches o/c along the edge of the substrate, full perimeter, and low side of control joints, Grid Lines C, G, and 19.

3.14 INSTALLATION OF REINFORCED GUSSETS

- .1 Install gussets at every angle, on inside and outside corners.
- .2 Heat-weld the gussets in place **after** installing the thermofusible base sheet membrane.
- .3 Install the thermofusible gussets **after** installing the self-adhesive base sheet membrane.
- .4 Install the self-adhesive gussets **before** installing the self-adhesive base sheet membrane.

3.15 BASE SHEET FLASHING INSTALLATION (SELF ADHERED)

- .1 Apply base sheet flashing only after primer coat is dry.

- .2 Before applying membranes, always remove the plastic film on the section to be covered if there is an overlap (inside and outside corners and field surface). For sanded base sheet membranes, apply ELASTOCOL STICK to the area to be covered at the foot of the parapets.
- .3 Position the pre-cut membrane piece. Peel back 100 to 150 mm. (4 to 6 in.) of the silicone release paper to hold the membrane in place at the top of the parapet.
- .4 Then, gradually peel back the remaining silicone release paper, pressing down on the membrane with an aluminum applicator to ensure good adhesion. Use the aluminum applicator to ensure a perfect transition between the upstand and the field surface. Smooth the entire membrane surface with a roller for full adhesion.
- .5 Ensure thermogusible plastic film is removed from field membrane at up-stand self adhesive base flashing tie-ins.
- .6 Cut off corners at end laps to be covered by the next roll.
- .7 Install a reinforcing gusset in all inside and outside corners.
- .8 Always seal overlaps at the end of the Workday.

3.16 INSTALLATION OF REINFORCEMENTS

- .1 Install reinforcements specified for various roof surfaces according to the following instructions and illustrations found in SOPREMA's technical data.

3.17 ROOFING CAP SHEET INSTALLATION (TORCH-APPLIED MEMBRANE)

- .1 Once base sheet is applied and no defects are apparent, proceed with cap sheet installation.
- .2 Begin with double-selvage starter roll. If starter roll is not used, side laps covered in granules must be degranulated by embedding side laps in torch-heated bitumen over a 100 mm. width.
- .3 Unroll cap sheet at drain. Carefully align first side lap (parallel to roof edge).
- .4 Weld cap sheet onto base sheet with torch recommended by membrane manufacturer. During application, simultaneously melt both designated contact surfaces so a bead of bitumen is apparent as cap sheet unrolls.
- .5 Stagger cap sheet end laps in order to create a uniform pattern.
- .6 Avoid overheating.
- .7 Make sure joints between the two layers are staggered by at least 300 mm.
- .8 Overlap cap sheet side laps by 100 mm. and end laps by 150 mm. Cut off corners at end laps to be covered by next roll. All overlap surfaces must be degranulated.
- .9 Complete perfect welds between two membranes. Leave no zone unwelded. In cold weather, adjust welding time to obtain homogenous seam (it may be necessary to slow down in certain cases.)
- .10 Once cap sheet is installed, carefully check all overlapped joints.
- .11 During installation, take care to avoid excessive bitumen bleed-out at joints.

3.18 INSTALLATION OF CAP SHEETS ON UPSTANDS AND PARAPETS (HEAT-WELDED)

- .1 This cap sheet must be installed in one-metre-wide strips. The side joints must overlap by 100 mm. and must be staggered by at least 100 mm. with respect to the joints of the cap sheet on the field surface, to avoid areas of excessive membrane thickness. The overlaps on the field surface must be 50 mm. wider than those of the base sheet membrane on the upstands and parapets. At end laps, angle-cut the corners that will be covered by the following roll.
- .2 Use a chalk line to draw a straight line on the field surface 150 mm. from the upstands and parapets.
- .3 Use a propane torch and round-nose trowel to embed the surface granules in the layer of hot bitumen [starting from the chalk line on the field surface to the bottom edge of the upstand or parapet as well as] on the granulated vertical surfaces that are to be overlapped.
- .4 This cap sheet will be heat-welded directly to the base sheet membrane, proceeding from bottom to top. This technique softens both membranes in order to obtain even, continuous weld.
- .5 During installation, be careful not to overheat the membrane or to create excessive bitumen bleeding at the joints.

3.19 INSTALLATION OF CAP SHEETS ON UPSTANDS AND PARAPETS (SELF-ADHERED)

- .1 This cap sheet must be installed in one-metre-wide strips. The side laps must overlap by 100 mm. and must be staggered by at least 100 mm. with respect to the joints of the cap sheet on the field surface to avoid areas of excessive membrane thickness. At end laps, angle-cut the corners that will be covered by the following roll.
- .2 The cap sheet must overlap the existing surface by a minimum of 150 mm. (6 in.).
- .3 Use a chalk line to draw a straight line on the field surface 150 mm. from the upstands and parapets.
- .4 Prime the surface of the upstand with ELASTOCOL STICK and allow to dry.
- .5 Position the pre-cut membrane piece. Peel back 100 to 150 mm. (4 to 6 in.) of the silicone release paper to hold the membrane in place at the top of the upstand. As you progressively remove the paper, use the aluminum applicator to ensure good adherence and a perfect transition between the upstand and the field surface.
- .6 Apply ELASTOCOL STICK primer before installing the next strip.
- .7 Smooth the entire membrane surface with a roller for full adhesion.
- .8 Using a 5 mm (3/16") steel trowel, apply COLPLY TROWEL GRADE adhesive to the first 125 mm. (5 in.) of the lap with the field surface. Note: It's not necessary to remove granulation from the cap sheet on the field surface and upstand borders with the usage of COLPLY adhesive.
- .9 Finish by heat-welding the last 25 mm. (1 in.) to the existing surface with an electric hot-air welder and roller. Provide a smooth application, free of wrinkles, fishmouths or air pockets.

3.20 EXPANSION JOINTS (SEE DETAILS ON PLANS) (SEE SOPREMA DETAIL SOP19)

- .1 Install expansion joints in conformance with SOPREMA DETAIL SOP19.

3.21 MEMBRANE WALKWAY INSTALLATION

- .1 Install membrane walkways respecting requirements previously stipulated for cap sheet installation. Apply primer to cap sheet before installing walkways.

3.22 WATERPROOFING FOR VARIOUS DETAILS

- .1 Install waterproofing membranes in conformance with various roofing details illustrated in the SOPREMA Manual.

4 Quality Assurance/Control

4.1 Membrane adhesion testing

- .1 Contract Administrator will retain testing agency to complete five pull tests to measure bond strength of air/vapour barrier membrane. Results will be compared to manufacturer's recommendations to determine if corrective action is required. At no point should the bond strength be less than 40 psi.
- .2 In the absence of manufacturer data, the standard of acceptance will be the average minus one standard deviation for the minimum bond strength.
- .3 Chain drag soundings will be completed on both the air/vapour barrier membrane installation and the cap sheet. A full and intimate bond is required. The contractor shall rectify any debonded areas in accordance with manufacturer's specifications.
- .4 In the event of any water penetration/leakage, the contractor shall be responsible for flood testing in order to diagnose the location/cause of the leakage. Remediation shall only be implemented upon approval of Contract Administrator.

4.2

- END OF SECTION -