Section 2 - General Requirements

Table of Contents

Section Titles | Page Number
---|---
2.00 General | 2-4
2.01 Design Responsibility | 2-4
2.02 Applicability | 2-4
2.03 Re-cover & Reroof Requirements & Considerations | 2-5
2.04 Manufacturer's Qualifications & Quality Assurance | 2-5
2.05 Contractor Qualifications | 2-6
2.06 Pre-Installation Meeting | 2-6
2.07 Job Site Considerations | 2-6
2.08 Delivery, Handling, & Storage | 2-6
2.09 Roof Drainage | 2-7
2.09.1 Drain Sizing & Construction | 2-7
2.09.2 Drain Inserts | 2-8
2.10 System Method of Attachment To Structural Deck | 2-8
2.10.1 Mechanically Attached/Fully Adhered Systems | 2-8
2.10.2 Bonded Systems | 2-8
2.10.3 Mechanically Attached Systems | 2-8
2.10.4 Partially Adhered Systems | 2-9
2.10.5 Protected Membrane Roof (PMR) Assemblies | 2-9
2.11 Roof Decks - General Requirements | 2-9
2.12 Roof Decks - New Construction & Complete Tear-Off | 2-10
2.12.1 Steel Decks | 2-10
2.12.1.1 Steel Decks - Membrane Method-Of-Application | 2-11
2.12.2 Poured-In-Place Structural Concrete Decks | 2-11
2.12.2.1 Poured-In-Place Structural Concrete Decks - Membrane Method-Of-Application | 2-12
2.12.3 Precast Concrete Decks | 2-13
2.12.3.1 Precast Concrete Decks - Membrane Method-Of-Application | 2-14
2.12.4 Prestressed Concrete Decks | 2-14
2.12.4.1 Prestressed Concrete Decks - Membrane Method-Of-Application | 2-15
2.12.5 Plank & Heavy Timber Wood Decks | 2-15
2.12.5.1 Plank & Heavy Timber Wood Decks - Membrane Method-Of-Application | 2-16
2.12.6 Plywood Decks | 2-16
2.12.6.1 Plywood Decks - Membrane Method-Of-Application | 2-17
2.12.7 Structural Wood Fiber Decks | 2-17
2.12.7.1 Structural Wood Fiber Decks - Membrane Method-Of-Application | 2-18
2.12.8 Poured-In-Place Gypsum & Gypsum Plank Decks | 2-18
2.12.8.1 Poured-In-Place Gypsum - Membrane Method-Of-Application | 2-18
2.12.9 Poured-In-Place Lightweight Insulating Concrete Decks (LWIC) | 2-19
2.12.9.1 LWIC Decks - Membrane Method-Of-Application | 2-20
2.12.10 Poured-In-Place Lightweight Insulating Cellular Concrete Decks (LWICC) | 2-20
2.12.10.1 LWICC Decks - Membrane Method-Of-Application | 2-22
2.13 Roof Decks - Re-Cover | 2-22
2.13.1 Gravel Surfaced Asphalt And/Or Coat Tar Pitch BUR Or Modified Bitumen Roofs | 2-22
2.13.2 Mineral Surfaced BUR Or Modified Bitumen Roof | 2-23
2.13.3 Non-Resaturated Or Coated Smooth Surface BUR Or Modified Bitumen Roof | 2-23

Soprema may modify the composition and/or utilization of its product without prior notice. Consequently, orders will be filled according to the latest specifications.
Section 2 - General Requirements

Table of Contents

<table>
<thead>
<tr>
<th>Section Titles</th>
<th>Page Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.23 Cap Membrane</td>
<td>2-38</td>
</tr>
<tr>
<td>2.22 Self-Adhered Applied Modified Bitumen Ply Membrane</td>
<td>2-38</td>
</tr>
<tr>
<td>2.22.3 Cold Process Applied Modified Bitumen Ply Membrane</td>
<td>2-37</td>
</tr>
<tr>
<td>2.22.2 Heat Welded Attachment Of Ply Membrane</td>
<td>2-37</td>
</tr>
<tr>
<td>2.22.1 Hot Asphalt Attachment Of Ply Membrane</td>
<td>2-37</td>
</tr>
<tr>
<td>2.22 Ply Membrane &amp; Ply Membrane Attachment</td>
<td>2-37</td>
</tr>
<tr>
<td>2.21.10.2 Base Sheet Used As Temporary Or Dry-In Roofing</td>
<td>2-36</td>
</tr>
<tr>
<td>2.21.10 Anchor Sheet Attachment</td>
<td>2-36</td>
</tr>
<tr>
<td>2.21.10.1 Base Anchor Sheet Application</td>
<td>2-36</td>
</tr>
<tr>
<td>2.21.9 Partial Self-Adhered Attachment Of Base Membranes</td>
<td>2-36</td>
</tr>
<tr>
<td>2.21.9.1 Partial Self-Adhered Attachment Of Base Membranes</td>
<td>2-36</td>
</tr>
<tr>
<td>2.21.8 Mechanical Attachment With Manually Driven Fasteners and Disks</td>
<td>2-35</td>
</tr>
<tr>
<td>2.21.7 In-Seam Mechanical Attachment Of Base Membranes With Screw Fasteners &amp; Disks</td>
<td>2-34</td>
</tr>
<tr>
<td>2.21.7.2 Soprafix With Self-Adhered Side Lap &amp; Self-Adhered Cap</td>
<td>2-34</td>
</tr>
<tr>
<td>2.21.7.1 Soprafix With Heat Sealed Side Lap - Heat Welded Or Self-Adhered Cap</td>
<td>2-34</td>
</tr>
<tr>
<td>2.21.6 Mechanical Attachment Of Base Sheets With Screw Fasteners &amp; Disks</td>
<td>2-34</td>
</tr>
<tr>
<td>2.21.5 Partial Heat Welded Attachment Of Base Membranes</td>
<td>2-34</td>
</tr>
<tr>
<td>2.21.4 Ribbon Strip Attachment Of Base Membranes</td>
<td>2-34</td>
</tr>
<tr>
<td>2.21.3 Cold Adhesive Attachment Of Base Sheets &amp; Base Membranes</td>
<td>2-33</td>
</tr>
<tr>
<td>2.21.2 Heat Welded Attachment Of Base Membranes</td>
<td>2-33</td>
</tr>
<tr>
<td>2.21.1 Hot Asphalt Attachment Of Base Sheets &amp; Base Membranes</td>
<td>2-33</td>
</tr>
<tr>
<td>2.21 Base Sheets, Base Membrane &amp; Base Sheet/Membrane Attachment</td>
<td>2-32</td>
</tr>
<tr>
<td>2.20.7 Thermal Barriers</td>
<td>2-32</td>
</tr>
<tr>
<td>2.20.6 Presecurement Of Insulation</td>
<td>2-32</td>
</tr>
<tr>
<td>2.20.5 Cold Adhesive Attachment Of Insulation</td>
<td>2-31</td>
</tr>
<tr>
<td>2.20.4 Hot Asphalt Attachment Of Insulation</td>
<td>2-31</td>
</tr>
<tr>
<td>2.20.3 Mechanical Attachment Of Insulation</td>
<td>2-30</td>
</tr>
<tr>
<td>2.20.2 Roof Insulation Attachment</td>
<td>2-30</td>
</tr>
<tr>
<td>2.20.1 Roof Insulation/Coverboard - Minimum Criteria &amp; Restrictions</td>
<td>2-28</td>
</tr>
<tr>
<td>2.20 Roof Insulation/Coverboard</td>
<td>2-27</td>
</tr>
<tr>
<td>2.19 Wood Nailers</td>
<td>2-26</td>
</tr>
<tr>
<td>2.18.3 Asphalt Heating &amp; Application</td>
<td>2-26</td>
</tr>
<tr>
<td>2.18.1 Asphalt Grades For Insulation, Coverboard, Base, Ply, &amp; Cap Membranes</td>
<td>2-26</td>
</tr>
<tr>
<td>2.18 Roofing Asphalt</td>
<td>2-26</td>
</tr>
<tr>
<td>2.17.1 Vapor Retarder Recommendations</td>
<td>2-25</td>
</tr>
<tr>
<td>2.17 Vapor Retarders</td>
<td>2-25</td>
</tr>
<tr>
<td>2.16 Area Dividers &amp; Control Joints</td>
<td>2-25</td>
</tr>
<tr>
<td>2.15.2 Expansion Joint Flashing Recommendations</td>
<td>2-25</td>
</tr>
<tr>
<td>2.15 Expansion Joints</td>
<td>2-24</td>
</tr>
<tr>
<td>2.14 Roof Deck Fastener Withdrawal &amp; Bonded Pull Resistance Testing</td>
<td>2-24</td>
</tr>
<tr>
<td>2.13.4 Resaturated Or Coated Smooth Surface BUR Or Modified Bitumen Roof</td>
<td>2-24</td>
</tr>
<tr>
<td>2.13.5 Sprayed-In-Place Urethane Roofs</td>
<td>2-24</td>
</tr>
<tr>
<td>2.13 Roofing Insulation/Coverboard</td>
<td>2-24</td>
</tr>
<tr>
<td>2.12.5 Sprayed-In-Place Urethane Roofs</td>
<td>2-24</td>
</tr>
<tr>
<td>2.12.4 Resaturated Or Coated Smooth Surface BUR Or Modified Bitumen Roof</td>
<td>2-24</td>
</tr>
<tr>
<td>2.12 Roofing Insulation/Coverboard</td>
<td>2-24</td>
</tr>
<tr>
<td>2.11.5 Sprayed-In-Place Urethane Roofs</td>
<td>2-24</td>
</tr>
<tr>
<td>2.11.4 Resaturated Or Coated Smooth Surface BUR Or Modified Bitumen Roof</td>
<td>2-24</td>
</tr>
<tr>
<td>2.11 Roofing Insulation/Coverboard</td>
<td>2-24</td>
</tr>
<tr>
<td>2.10.5 Sprayed-In-Place Urethane Roofs</td>
<td>2-24</td>
</tr>
<tr>
<td>2.10.4 Resaturated Or Coated Smooth Surface BUR Or Modified Bitumen Roof</td>
<td>2-24</td>
</tr>
<tr>
<td>2.10 Roofing Insulation/Coverboard</td>
<td>2-24</td>
</tr>
<tr>
<td>2.9.5 Sprayed-In-Place Urethane Roofs</td>
<td>2-24</td>
</tr>
<tr>
<td>2.9.4 Resaturated Or Coated Smooth Surface BUR Or Modified Bitumen Roof</td>
<td>2-24</td>
</tr>
<tr>
<td>2.9 Roofing Insulation/Coverboard</td>
<td>2-24</td>
</tr>
<tr>
<td>2.8.5 Sprayed-In-Place Urethane Roofs</td>
<td>2-24</td>
</tr>
<tr>
<td>2.8.4 Resaturated Or Coated Smooth Surface BUR Or Modified Bitumen Roof</td>
<td>2-24</td>
</tr>
<tr>
<td>2.8 Roofing Insulation/Coverboard</td>
<td>2-24</td>
</tr>
<tr>
<td>2.7.5 Sprayed-In-Place Urethane Roofs</td>
<td>2-24</td>
</tr>
<tr>
<td>2.7.4 Resaturated Or Coated Smooth Surface BUR Or Modified Bitumen Roof</td>
<td>2-24</td>
</tr>
<tr>
<td>2.7 Roofing Insulation/Coverboard</td>
<td>2-24</td>
</tr>
<tr>
<td>2.6.5 Sprayed-In-Place Urethane Roofs</td>
<td>2-24</td>
</tr>
<tr>
<td>2.6.4 Resaturated Or Coated Smooth Surface BUR Or Modified Bitumen Roof</td>
<td>2-24</td>
</tr>
<tr>
<td>2.6 Roofing Insulation/Coverboard</td>
<td>2-24</td>
</tr>
<tr>
<td>2.5.5 Sprayed-In-Place Urethane Roofs</td>
<td>2-24</td>
</tr>
<tr>
<td>2.5.4 Resaturated Or Coated Smooth Surface BUR Or Modified Bitumen Roof</td>
<td>2-24</td>
</tr>
<tr>
<td>2.5 Roofing Insulation/Coverboard</td>
<td>2-24</td>
</tr>
<tr>
<td>2.4.5 Sprayed-In-Place Urethane Roofs</td>
<td>2-24</td>
</tr>
<tr>
<td>2.4.4 Resaturated Or Coated Smooth Surface BUR Or Modified Bitumen Roof</td>
<td>2-24</td>
</tr>
<tr>
<td>2.4 Roofing Insulation/Coverboard</td>
<td>2-24</td>
</tr>
<tr>
<td>2.3.5 Sprayed-In-Place Urethane Roofs</td>
<td>2-24</td>
</tr>
<tr>
<td>2.3.4 Resaturated Or Coated Smooth Surface BUR Or Modified Bitumen Roof</td>
<td>2-24</td>
</tr>
<tr>
<td>2.3 Roofing Insulation/Coverboard</td>
<td>2-24</td>
</tr>
<tr>
<td>2.2.5 Sprayed-In-Place Urethane Roofs</td>
<td>2-24</td>
</tr>
<tr>
<td>2.2.4 Resaturated Or Coated Smooth Surface BUR Or Modified Bitumen Roof</td>
<td>2-24</td>
</tr>
<tr>
<td>2.2 Roofing Insulation/Coverboard</td>
<td>2-24</td>
</tr>
<tr>
<td>2.1.5 Sprayed-In-Place Urethane Roofs</td>
<td>2-24</td>
</tr>
<tr>
<td>2.1.4 Resaturated Or Coated Smooth Surface BUR Or Modified Bitumen Roof</td>
<td>2-24</td>
</tr>
<tr>
<td>2.1 Roofing Insulation/Coverboard</td>
<td>2-24</td>
</tr>
<tr>
<td>Soprema may modify the composition and/or utilization of its product without prior notice. Consequently, orders will be filled according to the latest specifications.</td>
<td></td>
</tr>
</tbody>
</table>
Table of Contents

<table>
<thead>
<tr>
<th>Section Titles</th>
<th>Page Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.23.1 Hot Asphalt Applied Modified Bitumen Cap Membrane</td>
<td>2-38</td>
</tr>
<tr>
<td>2.23.2 Heat Welded Modified Bitumen Cap Membrane</td>
<td>2-38</td>
</tr>
<tr>
<td>2.23.3 Cold Process Applied Modified Bitumen Cap Membrane</td>
<td>2-39</td>
</tr>
<tr>
<td>2.23.4 Self-Adhered Applied Modified Bitumen Cap Membrane</td>
<td>2-39</td>
</tr>
<tr>
<td>2.23.5 Modified Bitumen Membranes Over In-Seam Mechanically Attached Base Membranes</td>
<td>2-39</td>
</tr>
<tr>
<td>2.24 Steep Slope Fastening Requirements</td>
<td>2-39</td>
</tr>
<tr>
<td>2.24.1 Hot Asphalt Applied Base Membrane &amp; Cap Membrane</td>
<td>2-40</td>
</tr>
<tr>
<td>2.24.2 Hot Asphalt Applied Base Membrane &amp; Heat Welded Cap Membrane</td>
<td>2-40</td>
</tr>
<tr>
<td>2.24.3 Heat Welded Base Membrane &amp; Cap Membrane</td>
<td>2-40</td>
</tr>
<tr>
<td>2.24.4 Cold Process Applied Base Membrane &amp; Cap Membrane</td>
<td>2-41</td>
</tr>
<tr>
<td>2.24.5 Mechanically Fastened Soprafix Base &amp; Heat Welded Or Self-Adhered Cap</td>
<td>2-41</td>
</tr>
<tr>
<td>2.24.6 Self-Adhered Base &amp; Cap</td>
<td>2-41</td>
</tr>
<tr>
<td>2.25 Protected Membrane Roof (PMR) Assemblies</td>
<td>2-42</td>
</tr>
<tr>
<td>2.26 Cant Strips</td>
<td>2-43</td>
</tr>
<tr>
<td>2.27 Flashing</td>
<td>2-44</td>
</tr>
<tr>
<td>2.28 Roof Walkways</td>
<td>2-45</td>
</tr>
<tr>
<td>2.29 Coating Membrane Systems</td>
<td>2-46</td>
</tr>
<tr>
<td>2.30 Flood Coat &amp; Gravel Surfacing</td>
<td>2-46</td>
</tr>
<tr>
<td>2.31 Metal Work</td>
<td>2-46</td>
</tr>
<tr>
<td>2.32 Test Cuts</td>
<td>2-47</td>
</tr>
<tr>
<td>2.33 Extreme Weather Application</td>
<td>2-47</td>
</tr>
<tr>
<td>2.33.1 Cold Weather Application</td>
<td>2-47</td>
</tr>
<tr>
<td>2.33.2 Hot Weather Application</td>
<td>2-48</td>
</tr>
<tr>
<td>2.33.3 High Humidity Application</td>
<td>2-48</td>
</tr>
<tr>
<td>2.34 Practical Design Considerations</td>
<td>2-48</td>
</tr>
<tr>
<td>2.34.1 Climate &amp; Design</td>
<td>2-48</td>
</tr>
<tr>
<td>2.34.2 Wind Uplift Forces</td>
<td>2-48</td>
</tr>
<tr>
<td>2.34.3 Damaging Hail</td>
<td>2-49</td>
</tr>
<tr>
<td>2.34.4 Snow &amp; Ice Loads</td>
<td>2-49</td>
</tr>
<tr>
<td>2.34.5 Extreme Temperature Fluctuations</td>
<td>2-49</td>
</tr>
<tr>
<td>2.34.6 Ponding Water</td>
<td>2-49</td>
</tr>
<tr>
<td>2.35 Project Performance Requirements</td>
<td>2-50</td>
</tr>
<tr>
<td>2.36 Warranties</td>
<td>2-50</td>
</tr>
<tr>
<td>2.36.1 Warranty Procedure</td>
<td>2-50</td>
</tr>
<tr>
<td>2.36.2 Warranty Terms</td>
<td>2-51</td>
</tr>
</tbody>
</table>
Section 2 - General Requirements

2.00 - General

A. This section of the Soprema, Inc., hereafter referred to as Soprema, Technical Specification Manual shall be used in conjunction with Section 3 - SBS Application, Section 4 - SBS System Selection, and Modified Bitumen Flashing Details as they are applicable to project design and installation. This specification supersedes all previously published specifications and Technical Bulletins.

2.01 - Design Responsibility

A. The acceptance of the structural roof deck condition by Soprema refers solely to condition of the roof deck surface. The responsibility for the structural integrity of the roof deck system, for the proper design relationship among other building components, combined with the existing or potential interior and exterior environmental considerations, and the structural roof deck system rests solely with the design professional. This responsibility lies with the architect, roof consultant, engineer, building owner, or authorized building owner representative. Soprema reserves the right to accept or reject the existing deck conditions based on their suitability for specific Soprema assemblies and their corresponding methods of application.

2. Compliance with agency or building code approvals is determined on a project-by-project basis. Upon review by the Soprema Technical Department, Soprema will confirm approvals of various systems that will conform to specific agency or building code requirements. The term “agency” used in this context refers to Underwriters Laboratories, Inc. (UL) or FM Global (FM). The term “building code” used in this context refers to the International Building Code (IBC), or the applicable building code of the Authority Having Jurisdiction (AHJ).

2.02 - Applicability

A. Soprema Modified Bitumen Roofing Systems specifications are published for the purpose of defining the minimum requirements necessary for a roofing system to be eligible for a Soprema Warranty. Soprema strongly recommends that a roof design professional be consulted to address conditions beyond the scope of this specification to insure proper design and application procedures are followed as well as any Leadership in Energy and Environmental Design (LEED), Cool Roof Rating Council (CRRC), or Energy Star considerations.

B. Soprema SBS Modified Bitumen Roofing Assemblies are applicable for many low-slope commercial and industrial roofing applications. Soprema SBS Modified Bitumen Roofing Assemblies are not applicable where any one or more of the following conditions exists:

1. Roofs where the structural supports of the roof deck, or the structural conditions of the deck, are insufficient to support the load of the completed roof plus other potential loads as recognized by the architect, engineer, roof consultant, or building owner.

C. Without additional design considerations from the Soprema Technical Department, the following conditions are not applicable for Soprema SBS Modified Bitumen Roofing Assemblies:

1. Buildings with large wall openings that could be left open, or damaged enough to permit air infiltration, during a wind event. Large wall openings are defined as openings that equal surface area greater than ten percent (10%) of the total surface area of the wall.

2. Roofs subject to discharge that is known to be detrimental to the roof membrane or other components of the roofing system.

3. Roofs that may be exposed to positive air pressure from below the roof deck. These include, but are not limited to: buildings with a large number of bay doors; buildings with positive air pressure; aircraft hangars; roof decks that permit air infiltration; canopies; and overhangs.
Section 2 - General Requirements

4. Roofs subject to regular traffic, either foot or mechanical.

5. Cold storage facilities where the freezer or refrigeration insulation is used as a base to receive the new roof system.

D. Contact local building code officials with regard to roofs that are subject to additional building code requirements, including seismic considerations. Contact the Soprema Technical Department if there are questions about which Soprema system meets the applicable building code requirements.

2.03 - Re-cover & Reroof Requirements & Considerations

A. Existing roof systems with wet or damp components may have a significant effect on the new roofing system. A moisture survey should be conducted on an existing roof to determine the moisture content of the system. All components of the existing roof which are wet must be removed prior to installation of the new system. Depending on the warranty requirements of the project, a moisture survey may be required. Contact the Soprema Technical Department for specific warranty requirements.

B. Existing roof systems where the existing roof shall be removed down to the existing structural concrete, gypsum, lightweight insulating concrete, or cementitious wood fiber deck, and an adhesive will be used in the new roof assembly, will typically require bonded pull tests to confirm applicability of the new roof system. When this test is appropriate, the tests will be conducted in accordance with the current edition of the FM Global Loss Prevention Data Sheet 1-52. The tests may be performed by the adhesive manufacturer or by a certified independent test laboratory. Note: The test may be performed with fifteen (15 lb) pound (6.8 kg) increments instead of the published increment.

C. A design professional should be consulted to confirm the structural integrity of the existing roof deck. Repair or replacement of roof deck components with questionable structural integrity should be repaired or replaced as necessary.

D. Some existing building features do not permit minimum flashing heights to be achieved. Contact the Soprema Technical Department for review of the proposed detail when existing building features do not permit termination of the new roofing system at the minimum flashing height.

E. Re-covering over an existing single ply roofing system (i.e. EPDM, PVC, TPO, etc.) requires special consideration. Cut the existing single ply into five (5') foot (1.5 m) grid with a minimum one (1") inch (25 mm) wide strips removed at the grids.

F. Reuse of existing wood nailers is permitted as long as the condition of the nailers, as well as their attachment, are confirmed and judged to be suitable for the attachment of the new roofing system.

2.04 - Manufacturer’s Qualifications & Quality Assurance

A. Upon request, Soprema will supply proof of ISO 9001:2000 Certification.

B. Soprema Modified Bitumen roofing systems are installed by roofing contractors that are authorized by Soprema.

C. Soprema reserves the right to conduct an inspection to insure compliance with Soprema specifications for any type of Warranty.

D. The Soprema Technical Department is available for consultation concerning required deviations from current specifications due to existing building features or limitations.

E. Departures from current Soprema specifications, without first obtaining written permission from the Soprema Technical Department, may void any eligibility for the project to receive the applicable Soprema Warranty.
F. Upon successful completion and inspection of the roofing system, and compliance with all Warranty requirements, Soprema will issue the appropriate Warranty.

2.05 - Contractor Qualifications
A. The roofing contractor shall be a Soprema authorized roofing applicator. The contractor shall maintain this status from before the bid process begins until after the project is inspected.
B. Upon request by the building owner, or his representative, the roofing contractor shall present a letter confirming his authorization.
C. The roofing contractor shall provide a full time supervisor or foreman, experienced with the specified roof system, on site during the majority of working hours.
D. The roofing contractor shall maintain a work force skilled in the application method of the specified Modified Bitumen Roofing System. The crew shall be properly instructed in all applicable safety procedures.
E. The roofing contractor shall maintain all equipment and tools required to complete the work.

2.06 - Pre-Installation Meeting
A. A pre-installation meeting should be convened within five working days prior to beginning of work on the project. All parties responsible for Division 7 work should be required to attend.
B. All access, delivery, storage, and installation procedures should be reviewed. Coordination with related work from other trades should be determined. All unsettled issues should be noted in writing, the responsible parties assigned, and a timetable for resolution prepared.
C. Roofing work should not begin until a “Notice To Proceed” is issued after the pre-installation meeting by the authority having jurisdiction. The Notice To Proceed should include information on: acceptable staging areas; suitable parking and access points; location of refuse containers; working hour restrictions; sanitary requirements; noise restrictions; and complaint resolution protocol between the roofing contractor, other trades, and the building owner.

2.07 - Job Site Cautions & Considerations
A. All components of the new roofing system shall be protected from harmful contaminants and from discharge such as animal fat, petroleum base products, vegetable oil, and other related by-products which may come in to direct contact with the components during storage, installation, or end use.
B. Soprema neither performs nor reviews dew point analyses on projects where the Soprema Modified Bitumen Roofing System will be installed. Therefore, Soprema is not responsible for damage due to condensation from dew.
C. Except for initial installation, all Soprema roofing system components shall be protected from direct contact with sources of heat while in service.

2.08 - Delivery, Handling, & Storage
A. All materials shall be delivered and stored in their original unopened containers or packaging bearing the manufacturer’s name, industry related test standards, and approvals.
B. Insulation stored outside at a job site shall be stacked on pallets a minimum of four (4”) inches (102 mm) above ground level and covered with a waterproof tarp. The insulation manufacturer’s packaging is not considered to be a waterproof tarp and shall be slit on the narrow ends to avoid condensation inside the packaging.
C. Store all roofing materials in a dry area with adequate ventilation. Remove materials from dry, vented storage only as needed for daily production.

D. Consider the effect of loads on the structure and decking when stocking the roof. An attempt should be made to stock materials over deck support structures. Obtain permission from the building owner prior to stockpiling materials on the roof.

E. Replace all materials damaged during storage or transport.

F. Store all roll goods on end with selvage edge up.

2.09 - Roof Drainage

A. The building owner is responsible for designing proper and adequate drainage of the roof surface. Soprema recommends a minimum slope of one-quarter (¼") inch per horizontal foot (1') or two (2%) percent, combined with a maximum structural roof deflection of 1/240 per deck span, or as required by the local building code. However, positively sloped roofs with less than two (2%) percent slope can be considered when: local building codes permit; Alsan Flashing surface protection system is used; and/or the owner agrees to a Soprema Ponding Water Warranty Rider.

B. Improper drainage is defined as any area of the roof where water ponds for more than forty-eight (48) hours after a rainfall when conditions are conducive to drying. “Bird Baths” are expected and usually predictable. Ponding can also result from other sources of water including improperly plumbed HVAC discharge or condensation from steam lines. Roofs with ponding conditions that exceed the forty-eight (48) hour limit for ponding may still be warrantable with acceptance by the Soprema Technical Department and additional design considerations.

C. The Soprema Warranty does not apply to areas of a roof that have improper drainage or ponding water as described above. The building owner should consider provisions for additional work to insure proper drainage.

D. Each acceptable design must factor in the specific structural engineering requirements. Primary slope-to-drain requirements within the structure of each roof deck system, along with secondary slope-to-drain requirements which includes all conventional design options (i.e. crickets, saddles, tapered edge, and tapered insulation systems) to flow water to each drain point on the roof within the roofing system plane.

E. Special provisions apply when drain lines must be run at columns, walls, or other building design characteristics which create barriers for water to flow to drain points with enough flow. Tapered crickets and saddles, or a complete tapered insulation system, are recommended under these conditions to overcome normal span deflection or to expedite the flow of water to exterior or hard to reach drains.

2.09.1 - Drain Sizing & Construction

A. The sizing, which should be based on the Sheet Metal and Air Conditioning Contractors National Association, Inc. (SMACNA) rainfall chart, and construction parameters (i.e. gauge and dimension requirements) for all perimeter drainage conveyance should follow the guidelines set forth in the most recent SMACNA manual for gutters, downspouts, scuppers and overflow scuppers. For all interior drain systems, the sizing and flow rates must be calculated using the Standard Plumbing Code. Note: These calculations may be superseded by local code which must be verified. If the calculations are being made from known and accepted publications such as SMACNA, Standard Plumbing Code, ASCE 7-02, or current ASCE Document, and local building codes, then the most stringent interpretation will apply.
Section 2 - General Requirements

B. For existing construction, the existing building’s drainage system should be evaluated by the design professional for acceptability.* The correct operation of the existing drainage system, along with new drainage calculations if necessary, should be made to verify that the new Soprema roofing system will have adequate drainage in accordance with applicable building codes, SMACNA, and the Standard Plumbing Code. Note: These calculations should be made whether or not the secondary slope-to-drain requirements have been altered in the new design.

*If flow is not adequate in any area and remedial treatment for that area is deemed to impractical, then a decision is typically made to eliminate that water conveyance (i.e. drain scupper, downspouts, etc.). This will only be acceptable when a calculation certifies that the remaining drainage system has the layout and capacity to compensate for the elimination of the conveyance in question.

2.09.2 - Drain Inserts

A. The Designer Of Record must authorize the use of drain inserts. The material longevity of the insert and the watertight integrity of the connection at the insert flange is an owner maintenance item. The Designer Of Record must provide proof that the new drainage capacity calculation provides for water flow through the smaller diameter drain per the Standard Plumbing Code or applicable local building code.

2.10 - System Method of Attachment (MOA) To Structural Deck

A. General instructions for the membrane MOA are listed in this section. Guidelines when installing a Soprema system whether its critical attachment method relies on the system being fully adhered, mechanically attached, mechanically attached/fully adhered, or loose laid. Specific guidelines for each MOA are stated below.

2.10.1 - Mechanically Attached/Fully Adhered Systems

A. When the initial layer of the assembly is mechanically attached (i.e. thermal insulation or a thermal barrier) and successive layers are fully adhered (i.e. a layer of thermal insulation or coverboard), the mechanical attachment represents the critical attachment point for the roofing assembly. The point of critical attachment requires the use of acceptable fasteners, as described in section 2.20.3, and attachment pattern as specified by the fastener manufacturer or Soprema (base felts only). Note: If the system requires a Wind Rider, an insulation attachment warranty, or a Total System warranty, refer to “Design Value” under section 2.10.3 below and section 2.35 Warranties.

2.10.2 - Bonded Systems

A. When each layer of a roofing assembly is bonded with either Type IV certified asphalt, Soprema Adhesive (i.e. FM Adhesive for the membranes and/or High Velocity Insulation Adhesive for the insulation assembly), or heat welded, or a combination of these materials and methods, the entire system is considered to be adhered. Base or ply sheets such as Sopra G, Modified Sopra-G, Sopra IV, or Sopra VI and base, ply, and cap membranes such as Sopralene and Elastophene, may be bonded directly to acceptable decks in accordance with this specification or to acceptable substrates.

2.10.3 - Mechanically Attached Systems

A. Any warrantable Soprema system which is mechanically attached either through the mechanical attachment of a base felt layer or through layers of insulation (a multi-layer insulation assembly may be attached through the top layer with the correct size screw/plate combination) via the base membrane, or attached directly to the base membrane (i.e. Soprafix system), requires the following treatment. The attachment assembly must utilize an acceptable screw/plate fastening system and an approved attachment pattern from the insulation manufacturer or Soprema (fiberglass base sheet only). Note: For Soprema SBS membrane mechanical
attachment, only the approved Soprafix fastener/plate or Tri-Fix fastening systems and patterns supplied by Soprema are approved.

B. **Design Value:** On the following mechanically attached systems, the design value must be found and applied to determine the appropriate fastener/plate density and pattern for the attachment of Soprafix systems with riders for insulation attachment, high wind applications, and systems with Total System warranties with high wind risk. The design value is the lower value of the withdrawal resistance and the existing dynamic pull-through value (value determined by testing the membrane/plate or fiberglass felt/plate combination). This value is then used on the Soprema Field Fastener Calculation Sheet to yield the appropriate fastener and its accompanying density and pattern. Note: The design value is known for new steel, concrete, and wood decks but on all other deck conditions a withdrawal resistance value must be determined based on field testing.

2.10.4 - Partially Adhered Systems

A. Any time the initial layer of the roofing assembly is not fully adhered, but semi-adhered, the assembly is considered to be partially adhered. Due to the inherent attachment risk with a semi-adhered roofing system, each project must be reviewed on its own merit by the Soprema Technical Department.

2.10.5 - Protected Membrane Roof (PMR) Assemblies

A. All Bonded Systems described in section 2.10.2 above are eligible for use with PMR roof systems. When using cold adhesive systems under a PMR system, it will be necessary to delay the installation of the polystyrene, filter fabric, and ballast until the adhesive has cured.

2.11 - Roof Decks - General Requirements

A. The structural roof deck must be designed to provide adequate support. This includes, but is not limited to, live and dead loads for the specific building structure including those encountered during construction activity. The roof deck must be sufficiently rigid to prevent damage to the roofing components from excessive deflection due to anticipated equipment movement for repair and maintenance operations or any other similar roof related work. The end use of the building and geographical location must also be considered.

B. The Designer of Record is responsible for a properly designed and constructed roof deck, as well as the design interrelationship of all building components. The inherent elements of the deck must also be suitable to receive the new roof. Soprema claims no responsibility for any of the mentioned factors and assumes no liability under any circumstances.

C. The requirements for roof deck constructions and deck surface preparation which follow are provided as a guide for the Designer of Record. The Soprema acceptance of a roof deck as a satisfactory surface to accept the new roof system is limited to the surface of the roof deck and does not include the design, construction, or anchoring of the deck.

D. In order to be eligible for a Warranty, roof decks not listed in this specification must be submitted for review and accepted, in writing, by the Soprema Technical Department.

E. Regardless of roof deck type, the surface of the deck shall be dry, clean, smooth, free of debris or contaminants, exhibit evidence of proper design and construction, and be properly designed for anticipated loads with deflection that does not exceed 1/240 of the span at the midpoint of the span.

F. Construction of the roof deck shall be in accordance with the project specification and the roof deck manufacturer’s requirements. The Designer Of Record must determine if the decking system/structural supports are designed to withstand the uplift pressures the roof system is specified to meet.
Section 2 - General Requirements

G. Prior to installation of the new roof, all penetrations through the roof deck should be completed. Roof penetrations may not intersect with cant strips around the parapet or other locations where cant strips may be required. Roof penetrations may not be placed closer than twenty-four (24") inches (610 mm) from the base of a parapet wall, adjoining wall, or roof edge. Roof penetrations that are placed closer than the specified distance are subject to additional technical requirements.

H. Electrical conduit, gas pipes, or other utility piping may not be installed on the surface of the roof deck prior to installation of the roofing system. If piping of this kind is installed on the surface of the roof, then the piping shall be installed on wood blocking or other acceptable support. The local building code or the authority having jurisdiction may require piping to be secured to the structure. Contact your local building code to confirm this requirement.

I. For roof decks with slope greater than three-quarter (¾") inch per horizontal foot (6%), wood nailer insulation stops and backnailing of the base sheet are required. See Section 2.24 of this specification for additional information.

J. Expansion joints shall be designed and constructed in the appropriate quantity and placed in the proper position on the roof deck. Expansion joints must extend through the structural system to achieve function of purpose. Expansion joints shall be incorporated to separate sections of a building, to separate adjoining buildings, where steel roof decks change direction and anywhere else where extraordinary movement in the structure is anticipated.

K. If necessary to comply with local building code or insurance requirements, thermal barriers may be installed directly over the roof deck and under the roof assembly.

2.12 - Roof Decks - New Construction Or Complete Tear-Off

A. This section is intended to be used in conjunction with Section 2.11 Roof Decks General Requirements.

2.12.1 - Steel Decks

A. Structural steel decks must be a minimum of 22 gauge (0.8 mm) thick, be Type “A”, “B”, or “F” with a one (1”) inch (25 mm) maximum rib width for “A”; one and three-quarter (1 ¾”) inch (44 mm) maximum rib width for “F”; and two and one-half (2 ½”) inch (64 mm) maximum width for “B”. The steel deck may be Grade 33 or Grade 80 and shall be galvanized or factory painted. If a corrosion resistance design consideration exists, a galvanized coating equivalent to ASTM A 525, Class G-90 should be specified. The overlapping flanges shall be flat.

B. Steel deck fastening must comply with requirements of the manufacturer, or the authority having jurisdiction, and be designed to withstand anticipated wind pressures. The side and end laps must be fastened to insure the deck system minimizes deflection. The side laps must be button punched or screwed together on three (3’) foot (1 m), or less, centers. The end laps must have a minimum two (2”) inch (51 mm) overlap and be secured to supports with a maximum spacing of twelve (12”) inches (305 mm). The Designer Of Record must determine if the decking system/structural supports are designed to withstand the uplift pressures the roof system is specified to meet.

C. Wood nailers of equal thickness of the roof insulation must be provided at roof edges with gravel stops, drip edges, or gutters to function as insulation stops. Wood nailers may also be specified at parapet walls or penetrations to provide a fastening base for flanges of curbs or flashings.

D. Steel decks require the installation of thermal insulation, or gypsum board, and a base sheet prior to installation of the roofing membrane. The thermal insulation and gypsum board must be thick enough to span the flutes, as well as capable of withstanding mechanical and foot traffic, as recommended by

Soprema may modify the composition and/or utilization of its product without prior notice. Consequently, orders will be filled according to the latest specifications.
the manufacturer. The first layer of an insulated system may be loose laid or mechanically fastened with acceptable fasteners and plates. If the first layer is mechanically fastened, then successive layers may be hot mopped or cold adhesive applied. In all cases, positive mechanical attachment in one or more layers of the insulation/roof assembly, is required over steel roof decks.

E. When thermal insulation is installed in more than one layer, the bottom layer in the assembly must be mechanically fastened with acceptable fasteners and plates. Successive layers may be mechanically fastened, hot asphalt, or cold adhesive attached. As an alternate, all layers of the insulation/roof assembly may be mechanically fastened with a common fastener. In all cases, the fastener must penetrate the high rib flange of the steel deck.

F. Soprema Modified Bitumen Roofing Assemblies may not be installed directly over a steel deck without insulation or a thermal barrier.

2.12.1.1 - Steel Decks - Membrane Method-Of-Application

A. Adhered Systems: Direct application of any waterproofing layer to the steel deck is not approved or advisable. Soprema membrane systems applied with hot asphalt are acceptable with a minimum of one and one-half (1 ½”) inches (38 mm) of mechanically fastened insulation. Fully adhered heat weldable applications are used only with approved heat weldable substrates.

B. Mechanically Attached Systems: Soprema mechanically fastened membrane systems over steel decks must be applied with minimum one and one-quarter (1 ¼”) inch (32 mm) thick rigid board or one and one-half (1 ½”) inch (38 mm) thick compressible board. The insulation and membrane must be mechanically fastened directly to the high rib of the steel deck. For SBS membrane attachment only, the approved Soprafix screw and plate fastening systems and patterns as supplied by Soprema are approved. If a mechanically fastened system is used, the minimum attachment protocol from the insulation manufacturer for mechanically fastening the specific insulation system under a mechanically fastened membrane system must be followed. In lieu of the insulation manufacturer’s fastening requirements, the insulation may be pre-secured with the appropriate fastener and plate at the rate of one fastener and plate for every five-point-three-three (5.33 ft²) square feet (0.5 m²) of insulation surface area. A minimum of one and one-quarter (1 ¼”) inch (32 mm) thick insulation is required for any insulation under a Soprafix system.

2.12.2 - Poured-In-Place Structural Concrete Decks

A. Poured-in-place structural concrete decks must have a minimum compressive strength of 2,500 pounds per square inch (psi). The poured-in-place concrete must be properly cured a minimum of twenty-eight (28) days, or the period specified by the concrete manufacturer, prior to installation of the roofing system.

B. Poured-in-place structural concrete decks must provide for drying on the bottom side of the deck. Poured-in-place structural concrete decks poured over forms that are a permanent part of the structure and are not vented will not be accepted.

C. Poured-in-place structural concrete decks must be cured before work on the roof systems begins. Concrete decks that are wet from either a lack of cure time or recent participation must be permitted to dry. Frozen decks must be permitted to thaw and dry.

D. All poured-in-place structural concrete decks shall be smooth and free of dirt or contaminants. Concrete curing agents must be compatible with the new roofing system.

E. All poured-in-place structural concrete decks requiring hot asphalt attachment of insulation, membrane, or a vapor barrier directly to the deck shall be tested for dryness prior to beginning installation of the new roofing system. Soprema recommends one of the following tests to determine concrete dryness:
Section 2 - General Requirements

Method A:
1. Pour one (1) pint (.5L) of asphalt that has been heated to a minimum of four hundred (400˚ F) degrees Fahrenheit (204˚ C) on to the deck.
2. If the asphalt bubbles or foams, then the deck is not dry enough to begin work.
3. After the asphalt cools, peel it off the concrete deck. If the bitumen can be removed without demonstrating any evidence of adhesion, then it is not dry enough to proceed.

Method B:
1. Place a section of translucent material (i.e. clear Plexiglass or plastic) approximately twelve inches (12’ x 12”) by twelve inches (305 mm x 305 mm) on the concrete deck and seal the edges with duct tape. This method requires a sunny afternoon to be effective.
2. Permit the translucent material to remain in place for two hours.
3. If condensation appears on the bottom of the translucent material, then the deck is not dry enough to begin work.

F. The poured-in-place concrete roof deck must be level prior installation of the new roofing system. Ridges or irregularities must be ground flat and depressions must be filled with cement grout or other material accepted by the roof deck manufacturer. Voids or cracks greater than one-eighth (⅛”) inch (3.2 mm) wide must be filled with similar material.

G. For asphalt attachment of a vapor retarder, base ply, or insulation, poured-in-place concrete roof decks must be primed with an application of American Society for Testing and Materials (ASTM) D 41 asphalt primer such as Soprema Elastocol 400 or 500. The asphalt primer is applied at the rate of one (1) gallon per one hundred (100 - 150 ft²/gal) to one hundred and fifty square feet (.41 to .61 L/m²). Asphalt primer is not required if the first layer of the system is mechanically fastened or non-asphalt based adhesives are used.

H. If the concrete is existing, then care must be taken to remove the residue from the old roofing to the greatest possible extent. Surface damage caused by the removal of the old roof must be repaired. Proper curing or hydration of the deck must be confirmed, in writing, to the roofing contractor before the roofing application begins. On existing roof decks, or any structural concrete deck where pours have occurred for replacement and/or repair, the hydration rate must be consistent with the specified mix and for the geographic location where the mix is poured. Under tear-off conditions an acceptable dryness must be performed as described above.

I. The Designer of Record is responsible for determining the suitability of the deck for systems applied directly to the deck. Poured-in-place concrete decks with a textured finish are not acceptable where the roof membrane will be applied directly to the deck.

J. In most installations, a thermal insulation and a coverboard are required. A vapor barrier may also be included in the new roof assembly. Direct attachment to new, dry structural concrete or clean existing concrete may be acceptable. Contact the Soprema Technical Department. On re-cover projects, an acceptable recovery board is required.

2.12.2.1 - Poured-In-Place Structural Concrete Decks - Membrane Method-Of-Application

A. Adhered Systems: Once proper deck dryness is achieved, direct attachment of a fully adhered system is an acceptable method of attachment under the following guidelines. 1) All poured structural concrete decks must be primed before the use of a fiberglass base sheet or anchor sheets are applied. 2) These sheets are to be
applied in a full mopping of asphalt. Direct application of membrane with hot asphalt is not recommended. Fully adhered heat welded applications, after priming, may be acceptable under some age, condition, and geographical location criteria. Contact the Soprema Technical Department.

B. Mechanically Attached Systems: Soprema mechanically fastened membrane systems over concrete decks, whether bonded directly to an approved fiberglass base sheet or applied to insulation have a critical attachment point. The insulation may be mechanically fastened directly or bonded with an acceptable adhesive to an anchor felt, or bonded to a mechanically fastened SBS base membrane mechanically fastened directly to the deck. The critical attachment point of the system is considered to be the mechanical attachment. For SBS membrane attachment only, the approved Soprafix screw and plate fastening systems and patterns as supplied by Soprema are approved. If a mechanically fastened system is used over insulation, the minimum attachment protocol from the insulation manufacturer for mechanically fastening the specific insulation system under a mechanically fastened membrane system must be followed. In lieu of the insulation manufacturer’s fastening requirements, the insulation may be pre-secured with the appropriate fastener and plate at the rate of one fastener and plate for every five-point-three-three (5.33 ft²) square feet (0.5 m²) of insulation surface area.

2.12.3 - Precast Concrete Decks

A. Manufactured concrete roof panels must have a minimum compressive strength of 2,500 psi and a minimum nominal density of 150 pounds per square (psf) foot (150 lbs/ft²) (223 kg/m²). The cross sectional shapes include plain slab, channel slab, tongue and groove plank, and single and double “T”s”. They may be supported by structural steel, precast concrete beams, or load bearing walls.

B. All precast panels must be fully cured, clean, and not exhibit excessive camber. The beam or panel attachment to the structural element should be used to eliminate excess lateral movement and to provide adequate resistance to wind uplift forces. The precast manufacturers securement guidelines should be followed for the appropriate securement protocols. Special Precaution: All single and double “T” joints must be inspected for alignment. All joints should be grouted, with a grout approved by the manufacturer, and allowed to cure completely before the application of the roofing assembly.

C. Special Design Consideration: It is not uncommon for precast concrete deck systems to display out-of-plane unevenness due to excessive camber, misalignment, or irregularities caused by extra lateral and uplift bracing. If such a condition exists, it is possible that the slope to drain pattern has numerous negative sloped areas or the water does not flow as designed. If this has occurred, then a poured-in-place lightweight insulating concrete should be added to the prestressed concrete deck. A minimum pour of two (2”) inches (51 mm) is required, and the roofing system placed on top should conform to the criteria spelled out in the lightweight insulating concrete requirements.

D. Precast concrete decks must be dry before work on the roof system begins. Concrete decks that are wet from either a lack of cure time or recent participation must be permitted to dry. Frozen decks must be permitted to thaw and dry.

E. Concrete curing agents must be compatible with the new roofing system.

F. All precast concrete decks requiring hot asphalt attachment of insulation, membrane, or a vapor barrier directly to the deck shall be tested for dryness prior to beginning installation of the new roofing system. Soprema recommends the deck dryness procedures outlined in Section 2.12.2.

G. For asphalt attachment of a vapor retarder, base ply, or insulation, precast concrete roof decks must be primed with an application of ASTM D 41 asphalt primer such as Soprema Elastocol 400 or 500. The asphalt primer is applied at the rate of one (1) gallon per one hundred (100 - 150 ft²/gal) to one hundred and fifty
Section 2 - General Requirements

H. If the precast is existing, then care must be taken to remove the residue from the old roofing to the greatest possible extent. Surface damage caused by the removal of the old roof must be repaired. Proper curing or hydration of the deck must be confirmed, in writing, to the roofing contractor before the roofing application begins. On existing roof decks, or any precast deck where pours have occurred for replacement and/or repair, the hydration rate must be consistent with the specified mix and for the geographic location where the mix is poured. Under tear-off conditions an acceptable dryness must be performed as described in Section 2.12.2 above.

I. The Designer of Record is responsible for determining the suitability of the deck for systems applied directly to the deck. Poured-in-place concrete decks with a textured finish are not acceptable where the roof membrane will be applied directly to the deck.

J. Before installing the required rigid insulation, each joint should be covered with a partially adhered heat welded SBS base membrane. The minimum eight (8") inch (203 mm) wide heat welded joint cover shall be fully bonded on one side of the joint and left unattached on the other side.

K. In most installations, a thermal insulation and a coverboard are required. A vapor barrier may also be included in the new roof assembly. Direct attachment to new, dry precast concrete or clean existing precast concrete may be acceptable. Contact the Soprema Technical Department. On re-cover projects, an acceptable recovery board is required.

2.12.3.1 - Precast Concrete Decks - Membrane Method-Of-Application

A. Adhered Systems: Direct application of membrane with hot asphalt is not recommended or approved. Fully adhered heat welded applications, after priming, may be acceptable under some age, condition, and geographical location criteria. Contact the Soprema Technical Department.

B. Mechanically Attached Systems: Soprema mechanically fastened membrane systems over precast panels must be applied with insulation. The insulation is typically mechanically fastened directly into the panel. This mechanical attachment must include an acceptable fastener and plate with an acceptable insulation. For SBS membrane attachment only, the approved Soprafix screw and plate fastening systems and patterns as supplied by Soprema are approved. If a mechanically fastened system is used over insulation, the minimum attachment protocol from the insulation manufacturer for mechanically fastening the specific insulation system under a mechanically fastened membrane system must be followed.

2.12.4 - Prestressed Concrete Decks

A. These decks are typically precast panels which have been manufactured with an integral steel tenon reinforcement as an additional structural element. The compressive strength should meet 2,500 psi with a density of one hundred and ten (110 to 150 psf) to one hundred and fifty pounds per square foot (164 - 223 kg/m²). They are cast in a variety of shapes including plain slab, channel slab, hollow-core, and single and double “T's.”

B. All prestressed panels must be fully cured, clean, and not exhibit excessive camber. The beam or panel attachment to the structural element should be used to eliminate excessive lateral movement and to provide adequate resistance to wind uplift forces. The precast manufacturer securement guidelines should be followed for the appropriate securement protocols.

C. Prestressed concrete decks must be dry before work on the roof system begins. Concrete decks that are wet from either a lack of cure time or recent precipitation must be permitted to dry. Frozen decks must be
D. All prestressed concrete decks shall be smooth and free of dirt or contaminants. Concrete curing agents must be compatible with the new roofing system.

E. All prestressed concrete decks requiring hot asphalt attachment of insulation, base ply, or a vapor barrier directly to the deck shall be tested for dryness prior to beginning installation of the new roofing system. Soprema recommends the tests outlined in Section 2.12.2.

F. The prestressed concrete roof deck must be level prior installation of the new roofing system. Ridges or irregularities must be ground flat and depressions must be filled with cement grout or other material accepted by the roof deck manufacturer. Voids or cracks greater than one-eighth (⅛”) inch (3.2 mm) wide must be filled with similar material.

G. For asphalt attachment of a vapor retarder, base ply, or insulation, prestressed concrete roof decks must be primed with an application of ASTM D 41 asphalt primer such as Soprema Elastocol 400 or 500. The asphalt primer is applied at the rate of one (1) gallon per one hundred (100 - 150 ft²/gal) to one hundred and fifty square feet (.41 to .61 L/m²). Asphalt primer is not required if the first layer of the system is mechanically fastened or non-asphalt based adhesives are used.

H. If the prestressed is existing, then care must be taken to remove the residue from the old roofing to the greatest possible extent. Surface damage caused by the removal of the old roof must be repaired. Proper curing or hydration of the deck must be confirmed, in writing, to the roofing contractor before the roofing application begins. On existing roof decks, or any prestressed deck where pours have occurred for replacement and/or repair, the hydration rate must be consistent with the specified mix and for the geographic location where the mix is poured. Under tear-off conditions an acceptable dryness must be performed as described in Section 2.12.2 above.

I. The Designer of Record is responsible for determining the suitability of the deck for systems applied directly to the deck. Prestressed concrete decks with a textured finish are not acceptable where the roof membrane will be applied directly to the deck.

J. Before installing the required rigid insulation, each joint should be covered with a partially adhered heat welded SBS base membrane. The minimum eight (8”) inch (203 mm) wide heat welded joint cover shall be fully bonded on one side of the joint and left unattached on the other side.

K. In most installations, a thermal insulation and a coverboard are required. A vapor barrier may also be included in the new roof assembly. Direct attachment to new, dry prestressed concrete or clean existing prestressed concrete may be acceptable. Contact the Soprema Technical Department. On re-cover projects, an acceptable recovery board is required.

### 2.12.4.1 - Prestressed Concrete Decks - Membrane Method-Of-Application

A. Adhered Systems: Direct application of membrane with hot asphalt is not recommended or approved. Fully adhered heat welded applications, after priming, may be acceptable under some age, condition, and geographical location criteria. Contact the Soprema Technical Department for additional information.

B. Mechanically Attached Systems: Due to the inherent risk involved when working on panels with steel tenons, these systems are not recommended or approved.

### 2.12.5 - Plank & Heavy Timber Wood Decks

A. The minimum board thickness is one (1”) inch (25 mm) with ship-lap, tongue and groove, or splined side laps which interlock. Support shall be provided at the end of each board. The condition of the wood should be properly seasoned and dried with a clean surface free from sawdust, dirt, debris and any external or local...
environmental particulate matter. Cracks greater than one-quarter (¼") inch (6.4 mm), or knotholes greater than one (1") inch (25 mm) must be covered with sheet metal one (1") inch (25 mm) larger than the anomaly in all directions and be securely fastened to the deck.

B. The thickness of the planks is determined by the design loads anticipated for the roof and based on the distance between the supports. Boards must be free of warpage, excessive knots, dry or wet rot, or splits, which are equal to or greater than twenty-five (25%) percent of the thickness dimension. If any of these conditions exist, then remove and replace affected areas with similar materials.

C. All wood shall be stored a minimum of four (4") inches (102 mm) off of the ground and covered with a waterproof tarp. Plank and timber decks shall be covered with a roof membrane shortly after installation.

D. Heavy timber and plank decks must have a bearing surface on rafters at each end and be securely fastened to the support structure.

E. A mechanically fastened base sheet, a layer of insulation, or a separation layer are required between the wood deck and the new roofing system.

F. In the mechanical securement of the base sheets, annular ring shank nails with one (1") inch (25 mm) round flat heads are to be used. They must penetrate a minimum of three-quarter (¾") inch (19 mm). For the mechanical attachment of insulation on wood decks, only acceptable fasteners and plates may be used. For Soprafix mechanically attached membrane systems, only Soprema supplied fasteners and plates are acceptable.

G. For fully adhered insulation applications, a separator sheet, red rosin sheathing, must be used to prevent direct attachment of the insulation system to the wood plank deck.

2.12.5.1 - Plank & Heavy Timber Wood Decks - Membrane Method-Of-Application

A. Adhered Systems: Direct application of membrane with hot asphalt is not recommended or approved. A ply of red rosin sheathing must first be applied followed by the nailed base sheet before the application of membrane in hot asphalt. Heat welded applications require the use of a mechanically fastened impervious heavy-duty fiberglass base sheet. Long term warranties require a heavy duty venting base sheet.

B. Mechanically Attached Systems: All Soprema membrane systems over wood plank decks, which are mechanically attached, must be applied with a Soprafix fastener and plate system only. For existing wood decks, the fastener pullout value must be determined from withdrawal resistance field tests. A fire barrier may be used between the wood and the membrane. When gaps between planks exists, Sopraboard or other acceptable fire resistance barrier board must be used.

2.12.6 - Plywood Wood Decks

A. A multi-layer wood veneer composite, composed of an odd number of cross-laminated layers. The product must meet all prescriptive or performance parameters of the most recently published standard of the U.S. Product Standard (USPS) PS 1-83 for Construction and Industrial Plywood or meet exterior grade American Plywood Association (APA) Product Standard One (PS-1). If plywood other than APA PS-1 or USPS PS 1-83 is considered, then the Designer of Record is responsible for confirming compatibility between the roofing materials and any preservatives used to treat the plywood.

B. The minimum thickness for plywood is fifteen-thirty seconds (15/32") inch (12 mm) thick with a 32/16" span rating, and an exposure grade of 1, and have a joist spacing no greater than twenty-four (24") inches (610 mm) on center.

C. Fire retardant plywood is not an acceptable substrate for Soprema roofing systems.
D. All plywood shall be stored a minimum of four (4") inches (102 mm) off of the ground and covered with a waterproof tarp. Plywood decks shall be covered with a roof membrane shortly after installation.

E. Wood framing, or some other means, must be used to prevent deflection in the plywood deck.

F. Plywood decks must be secured to support members in accordance with APA recommendations.

G. A mechanically fastened base sheet, a layer of insulation, or a separation layer are required between the plywood deck and the new roofing system.

H. In the mechanical securement of the base sheets, annular ring shank nails with one (1”) inch (25 mm) round flat heads are to be used. They must penetrate a minimum of one-half (½”) inch (13 mm). For the mechanical attachment of insulation on wood decks, only acceptable fasteners and plates may be used. For Soprafix mechanically attached membrane systems, only Soprema supplied fasteners and plates are acceptable. Special Applications: In some cases, proprietary tape and staple systems may be used with prior acceptance from the Soprema Technical Department.

I. For fully adhered insulation applications, a separator sheet, red rosin sheathing, must be used to prevent direct attachment of the insulation system to the plywood deck.

2.12.6.1 - Plywood Decks - Membrane Method-Of-Application

A. Adhered Systems: Direct application of membrane with hot asphalt is not recommended or approved. A ply of red rosin sheathing must first be applied followed by the nailed base sheet before the application of membrane in hot asphalt. Heat welded applications require the use of a mechanically fastened impervious heavy-duty fiberglass base sheet. Long term warranties require a heavy duty venting base sheet.

B. Mechanically Attached Systems: All Soprema membrane systems over plywood plank decks, which are mechanically attached, must be applied with a Soprafix fastener and plate system only. For existing wood decks, the fastener pullout value must be determined from withdrawal resistance field tests. A fire barrier may be used between the plywood and the membrane. When excessive gaps between sections of plywood exists, Sopraboard, or other acceptable fire resistance barrier board, must be used.

2.12.7 - Structural Wood Fiber Decks

A. These decks consist of long strand wood fibers taken from selected tree species and mixed in a slurry or special binders. The final mixture is poured into a form to create a panel with a minimum thickness of at least two (2”) inches (51 mm). These panels are positioned over a steel frame network of bulb “T’s” or channels into which the panels are locked and create a rigid structural deck system.

B. All structural wood fiber decks shall be stored a minimum of four (4”) inches (102 mm) off of the ground and covered with a waterproof tarp. All structural wood fiber decks shall be covered with a roof membrane shortly after installation.

C. Structural wood fiber decks must be installed with level joints and in accordance with the manufacturer’s instructions.

D. Structural wood fiber decks must be able to support minimum design loads as recommended by the deck manufacturer.

E. Structural wood fiber decks must provide sufficient withdrawal resistance for fasteners. Fastener withdrawal testing will be required for any existing deck.
Section 2 - General Requirements

F. Structural wood fiber deck sections that become wet or deformed must be replaced with new decking.

G. Structural wood fiber decks must be covered with a roof membrane shortly after installation.

H. Structural wood fiber decks require the installation of a mechanically fastened base sheet or base membrane. Before any fastener/plate system may be used, fastener withdrawal resistance testing must be performed to determine a minimum characteristic value for design. Attachment protocol for determining the proper fastener density and layout should follow Soprema’s bulletins, details, and specifications.

I. Composite structural wood fiber decks that incorporate elements such as insulation or particleboard are not acceptable for use in Soprema roofing systems.

2.12.7.1 - Structural Wood Fiber Decks - Membrane Method-Of-Application

A. Adhered Systems: Direct application of membrane with hot asphalt is not recommended or approved. A ply of red rosin sheathing must first be applied followed by the nailed base sheet before the application of membrane in hot asphalt. Heat welded applications require the use of a mechanically fastened impervious heavy-duty fiberglass base sheet. Long term warranties require a heavy duty venting base sheet. Direct application of insulation or coverboard with an acceptable adhesive are subject to verification of meeting performance criteria. For existing structural wood fiber decks, bonded pull tests are required to verify the design will meet performance criteria.

B. Mechanically Attached Systems: Direct application of membrane with hot asphalt is not recommended or approved. A mechanically fastened base sheet is required before the application of membrane, or insulation, in hot asphalt. Heat welded applications require the use of a mechanically fastened impervious heavy-duty fiberglass base sheet. For existing structural wood fiber decks, the fastener pullout value must be determined from withdrawal resistance field tests.

2.12.8 - Poured-In-Place Gypsum & Gypsum Plank Decks

A. These systems typically consist of a poured gypsum, minimum two (2”) inches (51 mm) thick excluding the form board, consisting of a slurry of aggregate or wood fibers which is mixed on-site and poured-in-place over a steel frame supporting form boards. The pour is cast into a reticulation of galvanized wire. To permit adequate drying of the mix, interior ventilation must be integral to the design. The dry density of new gypsum concrete is typically between thirty and sixty (30 - 60 lbs/ft³) pounds per cubic foot (481 to 961 kg/m³). Gypsum decks are also composed of manufactured panels which are secured into an erected steel framework. Soprema roofing systems installed over structural gypsum decks are accepted on a job-to-job basis.

B. New or existing gypsum deck roofing systems that are designed with an accepted mechanically fastened base/anchor felt or base/anchor system, normally must incorporate venting by means of a mechanically fastened base sheet.

C. Before any fastener/plate system may be used, fastener withdrawal resistance testing must be performed to determine a minimum characteristic value for design. Attachment protocol for determining the proper fastener density and layout should follow Soprema’s bulletins, details, and specifications.

D. Existing gypsum deck roofing systems that are designed to be used with an accepted adhesive bonded insulation system are subject to bonded pull testing to determine a minimum characteristic values for design.

2.12.8.1 - Poured-In-Place Gypsum & Gypsum Plank Decks - Membrane Method-Of-Application

A. Adhered Systems: Direct application of membrane with hot asphalt is not recommended or approved. Heat welded applications require the use of a mechanically fastened impervious heavy-duty fiberglass base sheet. Long term warranties require a heavy duty venting base sheet. Direct application of insulation or coverboard
Section 2 - General Requirements

with an acceptable adhesive are subject to verification of meeting performance criteria. For existing gypsum decks, bonded pull tests are required to verify the design will meet performance criteria.

B. Mechanically Attached Systems: Direct application of membrane with hot asphalt is not recommended or approved. A mechanically fastened base sheet is required before the application of membrane, or insulation, in hot asphalt. Heat welded applications require the use of a mechanically fastened impervious heavy-duty fiberglass base sheet. For existing gypsum decks, the fastener pullout value must be determined from withdrawal resistance field tests.

2.12.9 - Poured-In-Place Lightweight Insulating Concrete Decks (LWIC)

A. All LWIC systems must conform to the LWIC manufacturer’s, and building code, requirements for suitability of the deck, the deck and the existing BUR roofing system, and for the climatic zone location of the installation. Further, the acceptance of the deck as it relates to suitability of the cure, compressive strength, oven dry density, and properly screeded surface is the sole responsibility of the deck manufacturer’s installer. The suitability of the deck must be confirmed to Soprema, by a letter from the LWIC installer stating that the LWIC has been installed in accordance with the manufacturer’s instructions and the project specifications, before the deck is acceptable for a Soprema roofing system.

B. The mechanical attachment of base sheets, anchor sheets, and membrane with their corresponding Soprema accepted fastener plate system over any trade name LWIC deck is governed by its independent testing approvals and qualification through on-site withdrawal resistance testing per Soprema’s fastener testing standard. Less than one hundred (100) squares (929 m²), a minimum of ten (10) tests, with four (4) being in the perimeter. Three (3) additional tests are required for every fifty (50) squares (465 m²) of roof surface.

C. A design that specifies rigid insulation board over the LWIC deck is restricted to existing LWIC decks. The attachment of the rigid insulation board must be to an acceptable anchor sheet. Acceptable anchor sheets would include a mechanically fastened ASTM D 4897 venting base sheet or other acceptable base sheet or base membrane. The rigid insulation board is fully adhered with hot asphalt to the vapor retarder. Note: any special attachment of the insulation with High Velocity Insulation Adhesive, or other acceptable low rise urethane adhesive, requires special mechanical attachment pattern and density protocols for the approved vapor retarder. Contact the Soprema Technical Department for additional information.

D. New LWIC systems should be designed with expanded polystyrene board encapsulated by the LWIC system per the LWIC deck manufacturer’s specifications. Rigid board insulation may not be placed over new LWIC systems.

E. Any recover application over an existing steel deck requires a report from a certified Structural Engineer stipulating the acceptability of the specific application. Specifically, the volume of LWIC in question against the design loads.

F. It is the responsibility of the Designer Of Record to determine if an assembly using an anchor sheet into existing LWIC, followed by a dry-in sheet that is mopped, heat welded, or cold adhesive applied, followed by a new LWIC meets the State or Local Building Pressure requirements for that specific project.

G. The LWIC system consists of a mixture of potable water that is clean and free of deleterious amounts of acid, alkali, and organic materials with either vermiculite or perlite aggregate and Portland cement conforming to Type I, II, or III as defined by ASTM C 150 or other standard as required by the manufacturer. The vermiculite loose fill used as aggregate in the LWIC shall comply with ASTM C 516. The perlite loose fill used as aggregate in the LWIC shall comply with ASTM C 549. The system is placed over a non-monolithic steel deck or monolithic concrete deck or existing BUR deck. The specified Soprema roof membrane assemblies are approved through independent laboratory wind uplift testing. The LWIC manufacturer and installer are responsible for all asbestos fibers, if any, used in this type of roof deck construction.
Section 2 - General Requirements

H. The system is mixed and poured to protocols that meet the specific climatic conditions and drainage requirements of the project site to produce a smooth, consistent deck that will screed to a smooth surface.

I. When poured over an acceptable slotted steel deck, minimum twenty-six (26 ga) gauge G-90 galvanized, or structural concrete deck, the pour must be a minimum of two (2") inches (51 mm) in depth. Over an existing BUR, check with the design professional and manufacturer as each case is different. The pour should also attain a minimum compressive strength of one hundred and twenty-five (125) psi (986 Pa) and an oven dry density of twenty-two (22 lb/ft³) pounds per cubic foot (352 kg/m³).

J. Expanded polystyrene (EPS) insulation board having a nominal density of one (1 pcf) pound per cubic foot (16 kg/m³) defined as Type I by ASTM C 578 and containing approximately three (3%) percent open area may be used in conjunction with the LWIC system.

K. When designed over a steel deck, the venting of the system must take place from above or below the deck. When these systems are installed over concrete decks, or over existing BUR roofing systems, they must be vented. Venting must be achieved through the field by means of a continuous venting through the base flashing and out through the counter-flashing, or through the flat edge details, incorporating perimeter blocking with curb cuts or perimeter metal, with built-in venting capabilities.

L. LWIC shall meet the following criteria: Range II - Cast density of 34-42 pcf, minimum compressive strength of 160 psi; Range III - Cast density of 42-50 pcf, minimum compressive strength of 250 psi. If fastener withdrawal testing values are significantly less than the published minimum anticipated values then cylinder sampling with subsequent laboratory testing may be required. Testing to be conducted in accordance with ASTM C495-91a. The data must be selected from laboratories designated by the manufacturer of the LWIC system and include the compressive strength and dry density.

M. If the LWIC is part of the Soprema Warranty, then cylinder sampling with subsequent laboratory testing may be required if fastener withdrawal testing values are significantly less than the published minimum anticipated values. Testing to be conducted in accordance with ASTM C495-91a and is to be incorporated in the warranty document. The data must be selected from laboratories designated by the manufacturer of the LWIC system and include the compressive strength and dry density.

N. If the LWIC is to be included in the Soprema Warranty, then either the LWIC must be warranted to Soprema by the LWIC manufacturer or a letter from the LWIC installer stating that the LWIC was installed in accordance with manufacturer’s requirements and the project specifications must be submitted by the roofing contractor.

2.12.9.1 - Poured-In-Place LWIC - Membrane Method-Of-Application

A. Mechanically Attached Systems: Direct application of membrane with hot asphalt is not recommended or approved. A mechanically fastened base sheet is required before the application of membrane, or insulation (reroof only), in hot asphalt. Heat welded applications require the use of a mechanically fastened impervious heavy-duty fiberglass base sheet. For LWIC decks, the fastener pullout value must be determined from withdrawal resistance field tests.

2.12.10 - Poured-In-Place Lightweight Insulating Cellular Concrete Decks (LWICC)

A. All LWICC systems must conform to the LWICC manufacturer’s, and building code, requirements for suitability of the deck, the deck and the existing BUR roofing system, and for the climatic zone location of the installation. Further, the acceptance of the deck as it relates to suitability of the cure, compressive strength, oven dry density, and properly screeded surface is the sole responsibility of the deck manufacturer’s installer.

B. The mechanical attachment of base sheets, anchor sheets, and membrane with their corresponding Soprema
accepted fastener plate system over any trade name LWICC deck is governed by its independent testing approvals and qualification through on-site withdrawal resistance testing per Soprema’s fastener testing standard. Less than one hundred (100) squares (929 m²), a minimum of ten (10) tests, with four (4) being in the perimeter. Three (3) additional tests are required for every fifty (50) squares (465 m²) of roof surface.

C. A design that specifies rigid insulation board over the LWICC deck is restricted to existing LWICC decks. The attachment of the rigid insulation board must be to an acceptable anchor sheet. Acceptable anchor sheets would include a mechanically fastened ASTM D 4897 venting base sheet or other acceptable base sheet or base membrane. The rigid insulation board is fully adhered with hot asphalt to the vapor retarder. Note: any special attachment of the insulation with High Velocity Insulation Adhesive, or other acceptable low rise urethane adhesive, requires special mechanical attachment pattern and density protocols for the approved vapor retarder. Contact the Soprema Technical Department for additional information.

D. New LWICC systems should be designed with expanded polystyrene board encapsulated by the LWICC system per the LWICC deck manufacturers specifications. Rigid board insulation may not be placed over new LWICC systems.

E. Any recover application over an existing steel deck requires a report from a certified Structural Engineer stipulating the acceptability of the specific application. Specifically, the volume of LWICC in question against the design loads.

F. It is the responsibility of the Designer Of Record to determine if an assembly using an anchor sheet into existing LWICC, followed by a dry-in sheet that is mopped, heat welded, or cold adhesive applied, followed by a new LWICC meets the State or Local Building Pressure requirements for that specific project.

G. The LWICC system consists of a mixture of potable water that is clean and free of deleterious amounts of acid, alkali, and organic materials with air entraining agent with foam concentrate which shall conform to ASTM C 869 and Portland cement conforming to Type I, II, or III as defined by ASTM C 150 or other standard as required by the manufacturer. The system is placed over a non-monolithic steel deck or monolithic concrete deck or existing BUR deck. The specified Soprema roof membrane assemblies are approved through independent laboratory wind uplift testing. The LWICC manufacturer and installer are responsible for all asbestos fibers used, if any, in this type of roof deck construction.

H. The system is mixed and poured to protocols that meet the specific climatic conditions and drainage requirements of the project site to produce a smooth, consistent deck that will screed to a smooth surface. The LWIC concentrate shall comply with ASTM C 869 when tested in accordance with ASTM C 796.

I. When poured over an acceptable slotted steel deck, minimum twenty-six (26 ga) gauge G-90 galvanized, or structural concrete, the pour must be a minimum of two (2”) inches (51 mm) in depth. Over an existing BUR, check with the design professional and manufacturer as each case is different. The pour should also attain a minimum compressive strength of two hundred (200) psi (1,378 Pa).

J. Expanded polystyrene (EPS) insulation board having a nominal density of one (1 pcf) pound per cubic foot (16 kg/m³) defined as Type I by ASTM C 578 and containing approximately three (3%) percent open area may be used in conjunction with the LWICC system.

K. When designed over a steel deck, the venting of the system must take place from above or below the deck. When these systems are installed over concrete decks, or over existing BUR roofing systems, they must be vented. Venting must be achieved through the field by means of a continuous venting through the base flashing and out through the counter-flashing, or through the flat edge details, incorporating perimeter blocking with curf cuts or perimeter metal, with built-in venting capabilities.

L. LWICC shall meet the following criteria: Range II - Cast density of 34-42 pcf, minimum compressive strength
of 160 psi; Range III - Cast density of 42-50 pcf, minimum compressive strength of 250 psi. If fastener withdrawal testing values are significantly less than the published minimum anticipated values then cylinder sampling with subsequent laboratory testing may be required. Testing to be conducted in accordance with ASTM C495-91a. The data must be selected from laboratories designated by the manufacturer of the LWICC system and include the compressive strength and dry density.

M. If the LWICC is part of the Soprema Warranty, then cylinder sampling with subsequent laboratory testing may be required if fastener withdrawal testing values are significantly less than the published minimum anticipated values. Testing to be conducted in accordance with ASTM C495-91a and is to be incorporated in the warranty document. The data must be selected from laboratories designated by the manufacturer of the LWICC system and include the compressive strength and dry density.

N. If the LWICC is to be included in the Soprema Warranty, then either the LWICC must be warranted to Soprema by the LWICC manufacturer or a letter from the LWICC installer stating that the LWICC was installed in accordance with manufacturer’s requirements and the project specifications must be submitted by the roofing contractor.

2.12.10.1 - Poured-In-Place LWICC - Membrane Method-Of-Application

A. Mechanically Attached Systems: Direct application of membrane with hot asphalt is not recommended or approved. A mechanically fastened base sheet is required before the application of membrane, or insulation (reroof only), in hot asphalt. Heat welded applications require the use of a mechanically fastened impervious heavy-duty fiberglass base sheet. For LWICC decks, the fastener pullout value must be determined from withdrawal resistance field tests.

B. Partially adhered systems utilizing Convent TG or SA base membranes shall be primed with Soprema Elastocol 400, 500, or 600c primer at the rate of one gallon per one hundred (100 - 150 ft²/gal) to one hundred and fifty square feet (.41 to .61 L/m²) no less than forty-eight (48) hours and no more than seventy-two (72) hours after the LWICC is poured. If precipitation is imminent on day three (3) after the pour, then the primer must be applied on day two (2) after the pour. Just prior to the application of the Convent, re-prime the surface with an application of Elastocol 400, 500, or 600c at the same rate as above. Contact the Soprema Technical Department for additional acceptable primers.

C. Partially adhered systems utilizing High Velocity Membrane Adhesive II shall be primed with Soprema Elastocol 400, 500, or 600c primer at the rate of one gallon per one hundred (100 - 150 ft²/gal) to one hundred and fifty square feet (.41 to .61 L/m²) no less than forty-eight (48) hours and no more than seventy-two (72) hours after the LWICC is poured. A second application of primer is not required unless the first application becomes excessively dusty or dirty. If precipitation is imminent on day three (3) after the pour, then the primer must be applied on day two (2) after the pour. Contact the Soprema Technical Department for additional acceptable primers.

2.13 - Roof Decks - Re-Cover

A. Complete removal of the existing roofing system and insulation shall be treated as new construction. Refer to the appropriate part of section 2.12 for information.

B. Depending on the condition of the existing roof assembly and the warranty required for the project, a moisture survey may be required.

2.13.1 - Gravel Surfaced Asphalt And/Or Coat Tar Pitch BUR Or Modified Bitumen Roofs

A. Gravel surfaced asphalt and/or coal tar pitch (CTP) BUR’s must be power broomed to remove any loose gravel. The high spots must be leveled and the depressions must be filled.
Section 2 - General Requirements

B. Any existing insulation determined to be wet shall be removed. Blisters shall be repaired. When wet insulation is removed and replaced, it must be covered with a layer of modified bitumen of equal thickness to the layer of gravel surfaced existing roof that was removed.

C. If there is moisture present within, or below, the layer of existing gravel, then a method of drying must be accomplished before proceeding with the installation of the new roof. As an alternate, the gravel may be spudded off and completely removed.

D. Gravel surfaced asphalt and/or CTP built-up roofs require the installation of an acceptable re-cover board and base sheet or a single layer of Soprema SopraBoard. The re-cover board and base sheet shall be mechanically fastened with a common fastener and plate. Over existing CTP, the SopraBoard must be one-quarter (¼”) inch (6.4 mm) thick. Direct application of Soprema roofing systems to CTP is not permitted. Caution: Fasteners that penetrate the existing roof and roof deck could cause CTP to flow into the building.

2.13.2 - Mineral Surfaced BUR Or Modified Bitumen Roof

A. Mineral surfaced modified bitumen or BUR's that have not been coated or resaturated may have a Soprema Modified Bitumen Roofing System installed directly over the mineral surface provide the following conditions are satisfied:

• Any existing insulation determined to be wet shall be removed. Blisters shall be repaired. When wet insulation is removed and replaced, it must be covered with a layer of modified bitumen of equal thickness to the layer of gravel surfaced existing roof that was removed;

• The surface of the existing roof does not have areas of loose alligatoring;

• All existing roof cement and/or patching material has been removed from the existing roof;

• The existing roof does not have large splits or cracks in the surface;

• The surface of the existing roof is primed with Soprema Elastocol 400 or 500 primer.

B. Prior to the installation of the roofing system, the asphalt primer is permitted to dry.

C. If additional insulation is required by the project specification, then the existing mineral surface does not have to be primed unless the additional insulation will be hot asphalt attached. If the existing mineral surface is not primed, then the additional insulation must be mechanically fastened.

D. If both additional insulation and a base sheet are required by the project specification, then both may be mechanically fastened with a common fastener and plate.

E. As an alternate, existing mineral surfaced roofs may be coated with Soprema Alsan Flashing. Contact the Soprema Technical Department for more information.

2.13.3 - Non-Resaturated Or Coated Smooth Surface BUR Or Modified Bitumen Roof

A. Smooth surface BUR or modified bitumen roofs that have not been resaturated or coated may have a Soprema Modified Bitumen Roofing System over the existing surface providing the following conditions are satisfied:

• Any existing insulation determined to be wet shall be removed. Blisters shall be repaired. When wet insulation is removed and replaced, it must be covered with a layer of modified bitumen of equal thickness to the layer of gravel surfaced existing roof that was removed.
Section 2 - General Requirements

• The surface of the existing roof does not have areas of loose alligatoring.
• All existing roof cement and/or patching material has been removed from the existing roof.
• The existing roof does not have large splits or cracks in the surface.
• The surface of the existing roof is primed with Soprema Elastocol 400 or 500 primer.

B. Prior to the installation of the roofing system, the asphalt primer is permitted to dry.
C. If additional insulation is required by the project specification, then the existing smooth surface does not have to be primed unless the additional insulation will be hot asphalt attached. If the existing smooth surface is not primed, then the additional insulation must be mechanically fastened.
D. If both additional insulation and a base sheet are required by the project specification, then both may be mechanically fastened with a common fastener and plate.
E. As an alternate, existing smooth surface roofs may be coated with Soprema Alsan Flashing. Contact the Soprema Technical Department for more information.

2.13.4 - Resaturated Or Coated Smooth Surface BUR Or Modified Bitumen Roof
A. Smooth surface BUR or modified bitumen roofs that have been resaturated or coated require a layer of Sopraboard, re-cover board, or a mechanically fastened base sheet.
B. If both a re-cover board and a base sheet are required by the project specification, then both may be mechanically fastened with a common fastener and plate.

2.13.5 - Sprayed-In-Place Urethane Roofs
A. Sprayed-in-place urethane roofs are not an acceptable substrates to receive a new Soprema roof and must be completely removed to the deck prior to installation of the new roofing system.

2.14 - Roof Deck Fastener Withdrawal & Bonded Pull Resistance Testing
A. Soprema requires fastener pullout testing on many deck types. The requirement to do the testing and the number of tests to be conducted will depend on the age of the roof deck, type of roof deck, and the system warranty requirements of the project. Fastener withdrawal testing is always required on reroof projects where threaded or manually driven fasteners are used. The authority having jurisdiction may have additional fastening requirements in addition to the Soprema Limited Warranty requirements. Fastener withdrawal resistance testing shall be conducted in accordance with the current edition of the ANSI/SPRI Standard Field Test Procedure For Determining The Withdrawal Resistance Of Roofing Fasteners or in accordance with the requirements of the authority having jurisdiction.
B. Soprema requires bonded pull testing on many existing monolithic deck types where the existing roof is removed down to the existing deck. The requirement to do the testing and the number of tests to be conducted will depend on the age of the roof deck, type of roof deck, and the system warranty requirements of the project. Bonded pull testing is always required on reroof projects where adhesives are used to anchor the membrane or insulation directly to the roof deck. The authority having jurisdiction may have additional bonding requirements in addition to the Soprema Limited Warranty requirements. Bonded resistance testing shall be conducted in accordance with the current edition of the FMG Loss Prevention Data Sheet 1-52 “Field Uplift Tests” or in accordance with the requirements of the authority having jurisdiction.

2.15 - Expansion Joints
Section 2 - General Requirements

A. The design and location of expansion joints are the responsibility of the Designer of Record. Unless approved prior to bid, only Soprajoint can be included in the Soprema Warranty Document.

2.15.1 - Expansion Joint Design Recommendations
A. Although the design and location of expansion joints are the responsibility of the Designer of Record, Soprema recommends that expansion joints are included in the design whenever:
   • One dimension of the building exceeds two hundred (200') feet (61 m);
   • Steel framing or structural steel changes direction or elevation;
   • Roof decking changes direction such as in “T”, “U”, or “L” shapes and the decking going each direction is not fastened to the same structural member;
   • The roof deck material changes from one decking material to another;
   • New additions are connected to an existing buildings;
   • Junctions such as canopies, overhangs, or loading docks into a main structure or where expansion joints are part of the new or existing structural system.

2.15.2 - Expansion Joint Flashing Recommendations
A. Soprema Soprajoint is suitable for both roof level and raised expansion joints.
B. Expansion joints shall be continuous and shall not be ended before the break in the structure.
C. All metal/elastomeric composite expansion joint covers shall be elevated on curbs a minimum of eight (8") inches (203 mm) above the surface of the roof.

2.16 - Area Dividers & Control Joints
A. Any design, whether utilizing a vertical or horizontal blocking configuration, which covers areas of the roofing system that do not involve structural building components, differential movement, but is designed solely to interrupt the build-up and/or transfer of membrane system stresses, caused by thermal factors, torsional movement, geometric imbalance (L or H shaped roof layouts) or by gross dimensional restrictions (a total distance not to exceed two hundred (200') feet (61 m) in any one direction), requires the use of a control joint. Note: These designs must not interfere or restrict the logical slope-to-drain pattern of the roofing system. If so, alternate slope-to-drain design provisions must be made. Refer to Approved Details for more information.
B. The design and location of area dividers and control joints are the responsibility of the Designer of Record.
C. Area dividers and control joints are acceptable alternatives to expansion joints if they are installed where they were not included in the original design. Area dividers and control joints should be designed and installed using the same criteria as expansion joints.

2.17 - Vapor Retarders
A. The Designer of Record is responsible for the need, design, and placement of a vapor retarder.

2.17.1 - Vapor Retarder Recommendations
A. The need, design, and placement of a vapor barrier should be investigated if any of the following conditions exists:
• A project where the outside average January temperature is below forty (40°F) degrees Fahrenheit (5°C) and where interior relative humidity of forty-five (45%) percent or greater is possible;
• A project where construction components or construction processes may create moisture after the roof is installed and temporarily create the conditions described above.

2.18 - Roofing Asphalt
A. Hot asphalt applied Soprema roofing systems require the use of ASTM D 312 Type IV asphalt for the application of insulation, coverboard, base sheet, base membrane, ply sheet, ply membrane, and cap membrane.

2.18.1 - Asphalt Grades For Insulation, Coverboard, Base, Ply, & Cap Membranes
A. ASTM D 312, Type IV or ASTM D 6152 SEBS Type IV asphalt can be used for insulation, coverboard, base sheet, base membrane, ply sheet, ply membrane, and cap membrane mopping on slopes four inches (4:12) in twelve inches (33%) or less.

2.18.2 - Asphalt Identification
A. Soprema recommends an identification system for mopping grade asphalt and the practical use of the information. The following information should be printed on the asphalt packages or bills of lading covering bulk asphalt and should include:
  • Type IV per ASTM D 312 or ASTM D 6152;
  • Flash Point (FP) per ASTM D 92;
  • Equiviscous Temperature Range (EVT).

2.18.3 - Asphalt Heating & Application
A. Soprema requires that all mopping grade asphalt to be applied at the EVT range specific to the application method, i.e. mopping or mechanical spreader, as printed on the asphalt cartons or bills of lading.
B. The asphalt at the point of application shall be the EVT plus or minus twenty-five (25°F) degrees Fahrenheit (13°C). For manual mopping, a viscosity of one hundred and twenty-five (125) centipoise should be achieved. For mechanical spreaders, a viscosity of seventy-five (75) centipoise should be achieved. Under no circumstances shall the asphalt temperature be less than four hundred and twenty-five (425°F) degrees Fahrenheit (219°C) at the point of application.
C. Asphalt for thermal insulation applications over concrete shall be applied at the rate of thirty (30 lbs.) pounds per one hundred (100) square feet (1.44 kg/m²) plus or minus twenty (20%) percent. Asphalt attachment of thermal insulation shall be limited to four feet (4’x4’) by four feet (1.2 m x 1.2 m) boards.
D. Asphalt for thermal insulation over gypsum, coverboard over thermal insulation, base sheet, ply sheet, or cap sheet shall be applied at the rate of twenty-five (25 lbs.) pounds per one hundred (100) square feet (1.2 kg/m²) plus or minus twenty (20%) percent.
E. Asphalt for base sheet, ply sheet, or cap sheet installation shall be applied no more than three (3’) feet (1 m) in front of the roll at all ambient temperatures.
F. Thermometers on kettles and tankers shall be in good working order and checked periodically to insure accuracy.

2.19 - Wood Nailers
A. On new construction or complete tear-off projects, wood nailers must be kiln-dried structural grade number
two projects where the existing roof will be left in place and a re-cover board will be added, wood nailers must be pressure treated for rot resistance and be number two (#2) or better lumber. Asphaltic, creosote, or field treatment for rot resistance are not acceptable.

B. Wood nailers are required at the following locations:
   • Where parapet walls or adjoining walls are not present to serve as insulation stops;
   • Where sheet metal is used and not fastened directly to the metal roof deck;
   • Where sheet metal is used and the fastener spacing is greater than six (6") inches (152 mm) o.c. over the insulation (The minimum fastening rate for pitch pans is two (2) fasteners per flange);
   • Where specified in Section 2.24 Steep Slope Fastening Requirements of this specification.
   • At all locations as required by Soprema details or the Designer of Record.

C. The Designer of Record shall specify that the attachment of wood nailers must resist a minimum of two hundred (200 lbs.) pounds (91 kg) of withdrawal per lineal foot in all directions. Fasteners that are used to attach wood nailers to the substrate must meet the corrosion resistance criteria of FM 4470.

2.20 - Roof Insulation/Coverboard

A. The selection of insulation and/or coverboard as the substrate to receive the new Soprema roofing system are the responsibility of the Designer of Record. The Designer of Record is also responsible for selecting insulation and/or coverboard type and thickness but may not select types or thicknesses that are not acceptable to Soprema.

B. Soprema reserves the right to accept or reject any roof insulation and/or coverboard as a suitable substrate for attachment of a Soprema roofing system. Sprayed-in-place polyurethane foam and Phenolic Foam are not acceptable substrates to receive a Soprema roofing system.

C. The roof insulation and/or coverboard must be manufactured for use as a roof insulation and must be able to withstand foot traffic without crushing.

D. Roof insulation must have the integral strength necessary to span the flutes on metal deck. Contact the insulation manufacturer for flute spanability guidelines.

E. Heat welded modified bitumens shall not be heat welded directly to combustible insulations, insulations with combustible facers, or combustible coverboards.

F. Hot asphalt applied modified bitumens shall not be applied directly to polyisocyanurates with kraft/glass facers.

G. Asphalt based cold adhesive applied modified bitumens may not be applied directly to polyisocyanurates with kraft/glass facers without prior written approval from the Soprema Technical Department.

H. All thermal roof insulations manufactured in four feet (4’x8’) by eight feet (1.2 m x 2.4 m) size must be mechanically fastened in accordance with Soprema requirements.

I. Mechanical fastening of insulation, whether it be the thermal insulation or the coverboard, shall be increased by fifty (50%) percent on the perimeter and seventy-five (75%) percent in the corners. The perimeter and corner dimensions shall be the lesser of forty (40%) percent of the building height or ten (10%) percent of the building’s lesser plan dimension. The minimum dimension for the perimeter and corners is six (6’) feet (1.8 m). Successive layers of insulation may be hot asphalt or cold adhesive attached to a mechanically fastened base layer. Additional fastening may be required in the corners to accommodate building code or...
Section 2 - General Requirements

J. All thermal roof insulations that are hot asphalt attached, either full mopping or strip mopping, or cold adhesive attached, either fully bonded or ribbon stripped, shall be no larger than four feet (4’x4’) by four feet (1.2 m x 1.2 m) unless approved in writing by the Soprema Technical Department prior to the job start. Hot asphalt strip mopping is not acceptable on the perimeter or in the corners of the building. Hot asphalt or cold adhesive attachment of insulation is not permitted directly to vapor barriers with a burn-off film on the top surface.

K. Cold adhesive attachment of insulation, whether it be the thermal insulation or a coverboard, shall be increased by fifty (50%) percent on the perimeter and seventy-five (75%) percent in the corners. The perimeter and corner dimensions shall be the lesser of forty (40%) percent of the building height or ten (10%) percent of the building’s lesser plan dimension. The minimum dimension for the perimeter and corners is six (6’) feet (1.8 m). Cold adhesive attachment of insulation directly to metal decks is not permitted unless approved in writing by the Soprema Technical Department prior to the job start.

L. Contact the authority having jurisdiction regarding R-value requirements to comply with building and/or energy codes.

2.20.1 - Roof Insulation/Coverboard - Minimum Criteria & Restrictions

A. The listed insulation thicknesses are minimums in a fully supported application. Refer to the insulation manufacturer’s literature for maximum flute spanability over metal deck.

B. All insulations must be UL Classified and FM Approved.

C. The following insulation/coverboard requirements only represent what is necessary for the assembly to qualify for a Soprema Limited Warranty. Additional requirements may be necessary in order for a qualified assembly to meet building code criteria. Contact the Soprema Technical Department to confirm agency compliance of an entire assembly before bidding or installation of the system begins.

- Polyisocyanurate must meet the ASTM C 1289 standard, Type II, Class 1. The minimum thickness is one and one-half (1½”) inch (38 mm) for flat stock and one-half (½”) inch (13 mm) for tapered systems on all fully adhered systems. The minimum thickness is one and one-quarter (1¼”) inch (32 mm) for flat stock and one-half (½”) inch (13 mm) for tapered systems on Soprafix systems. For hot asphalt or asphalt based cold adhesive applied modified bitumen systems, an acceptable coverboard is required. Acceptable coverboards for hot asphalt, or asphalt based cold adhesive, applied systems would be Sopraboard, wood fiber, perlite, or acceptable gypsum. For heat welded modified bitumen systems, acceptable coverboards would be Sopraboard or acceptable gypsum. For self-adhered modified bitumen systems, acceptable coverboards would be Sopraboard or acceptable gypsum. See this section for asphalt priming requirements on coverboards. Soprema does not require a coverboard for mechanically attached modified bitumen systems, however, a coverboard may be required to meet building code criteria.

- Perlite/Polyisocyanurate Composite must meet the ASTM C 1289 standard for the polyisocyanurate and the ASTM C 728 standard for the perlite. The minimum thickness is one and one-half (1½”) inch (38 mm) for flat stock and one (1”) inch (25 mm) for tapered systems. The insulation must be installed with the perlite side up if it will be hot asphalt attached, cold adhesive attached or mechanically fastened. If the composite is installed with the perlite side down, then the coverboard requirements described above in “Polyisocyanurate” would apply.

- Expanded Polystyrene (EPS) must meet the ASTM C 578 standard. The minimum thickness is one (1”) inch (25 mm) for flat stock and one-half (½”) inch (13 mm) for tapered systems. The minimum density is one (1 lb.) pound (0.45 kg). If the EPS will be adhered using Soprema High Velocity Insulation Adhesives or used in conjunction with EPS Flam Stick base membrane, then the minimum density is one and one quarter (1¼
lb.) pound (0.56 kg). For hot asphalt or asphalt based cold adhesive applied modified bitumen systems, an acceptable coverboard is required. Acceptable coverboards would be Sopraboard, wood fiber, perlite, or acceptable gypsum. For heat welded modified bitumen systems, an acceptable coverboard is required. Acceptable coverboards for heat welded systems would be Sopraboard or a acceptable gypsum. For self-adhered modified bitumen systems, an acceptable coverboard would be Sopraboard or acceptable gypsum, although a coverboard is not required with EPS Flam Stick. See this section for asphalt priming requirements on coverboards. For mechanically fastened modified bitumen systems, an acceptable coverboard would be Sopraboard or acceptable gypsum. Soprema does not require a coverboard for mechanically attached modified bitumen systems, however, a coverboard may be required to meet building code criteria.

*Asphalt based cold adhesive applied modified bitumen systems over EPS require written permission from the Soprema Technical Department. Contact the Soprema Technical Department for more information.

- Perlite/Expanded Polystyrene Composite must meet the ASTM C 578 standard for the EPS and the ASTM C 728 standard for the perlite. The minimum thickness is one and one-half (1 ½”) inch (38 mm) for flat stock and one (1”) inch (25 mm) for tapered systems. The minimum density for the EPS is one (1 lb.) pound (0.45 kg). The composite may be installed with the perlite side up or down. If the composite will be installed with the perlite side down, then the coverboard requirements described above in “Expanded Polystyrene” would apply. If the composite will be installed with the perlite side up, then a coverboard is not required unless a heat welded or self-adhered modified bitumen system will be applied. See Expanded Polystyrene (EPS) paragraph above if Soprema High Velocity Insulation Adhesives will be used to adhere the EPS or adhere a coverboard to the EPS.

- Wood Fiber/Expanded Polystyrene Composite must meet the ASTM C 578 standard for the EPS and the ASTM C 208 standard for the wood fiber. The minimum thickness is one and one-half (1 ½”) inch (38 mm) for flat stock and one (1”) inch (25 mm) for tapered systems. The minimum density for the EPS is one (1 lb.) pound (0.45 kg). The composite may be installed with the wood fiber side up or down. When the composite will be installed with the wood fiber side up, then a coverboard is not required unless a heat welded or self-adhered modified bitumen system will be applied. See Expanded Polystyrene (EPS) paragraph above if Soprema High Velocity Insulation Adhesives will be used to adhere the EPS or adhere a coverboard to the EPS.

- Soprema Sopraboard, minimum thickness is one-eighth (⅛”) inch (3.2 mm). Sopraboard is an insulation or re-cover overlay board consisting of a mineral/asphaltic core between two layers of high strength reinforcing glass fiber mats. Sopraboard is available in one-eighth (⅛) inch (3.2 mm), three-sixteenths (3/16”) inch (4.7 mm), and one-quarter (¼”) inch (6.4 mm).

- High density wood fiberboard insulation must meet ASTM C 208 standards. Minimum thickness is seven-sixteenth (7/16”) inch (11 mm).

- Perlite must meet the ASTM C 728 standard. The minimum thickness is three-quarter (¾”) inch (19 mm). Perlite may only be adhered with hot asphalt and may not be adhered with any urethane based adhesive.

- Cellular glass insulation must meet ASTM C 552 standards. Minimum thickness is one (1”) inch (25 mm). For hot asphalt or asphalt based cold adhesive applied modified bitumen systems, an acceptable coverboard is required. Acceptable coverboards for hot asphalt, or asphalt based cold adhesive, applied systems would be Sopraboard, wood fiber, perlite, or glass-faced gypsum. For heat welded modified bitumen systems an acceptable coverboard would be Sopraboard or a acceptable gypsum. For self-adhered modified bitumen systems, an acceptable coverboard would be Sopraboard or acceptable gypsum. See this section for asphalt priming requirements on coverboards. A coverboard is not required for mechanically attached modified bitumen systems.
Section 2 - General Requirements

- Glass-faced gypsum coverboard must meet ASTM C 1177 standards. Minimum thickness is one-quarter (¼”) inch (6.4 mm). As a coverboard over thermal insulation, glass-faced gypsum may be pre-secured, mechanically anchored, adhered with acceptable asphalt, or adhered with acceptable cold adhesive. As a thermal barrier installed below the thermal insulation and/or roof membrane, the minimum thickness is one-half (½”) inch (13 mm). In heat welded applications, a factory primed board is required. In self-adhered applications, an application of Soprema Elastocol Primer, or ASTM D 41 asphalt primer, is required. In hot asphalt or cold adhesive applications, asphalt primer is not required.

- Unfaced gypsum coverboard must meet ASTM C 1278 standards. Minimum thickness is one-quarter (¼”) inch (6.4 mm). As a coverboard over thermal insulation, unfaced gypsum may be pre-secured, mechanically anchored, adhered with acceptable asphalt, or adhered with acceptable cold adhesive. As a thermal barrier installed below the thermal insulation and/or roof membrane, the minimum thickness is one-half (½”) inch (13 mm). In all applications where the roof membrane, or vapor barrier will be applied directly to the unfaced gypsum, an application of Soprema Elastocol Primer, or ASTM D 41 asphalt primer, is required.

- Extruded Polystyrene must meet ASTM C 578, Type VI minimum standards. If the extruded polystyrene insulation is used below the roof membrane, then the same coverboard requirements listed for EPS apply. All extruded polystyrene insulation used on top of the roofing membrane must be covered with an acceptable filter fabric and a minimum of ten (10 lbs.) pounds per square foot (48.8 kg/m²) of acceptable ballast with additional ballast in the perimeter and corners per the insulation manufacturer’s specifications. To assist in draining the roof, channel cut insulation may be installed in lieu of standard Type VI described herein.

- Extruded Polystyrene/Mortar faced laminate, minimum thickness is two (2”) inches (51 mm). The extruded polystyrene must meet ASTM C 578 standards and have a minimum density of two-point-two (2.2 lbs.) pounds per cubic foot (35.3 kg/m³). The mortar facing must be a latex modified mortar between three-eighths (⅜”) inch (9.5 mm) and fifteen-sixteenths (15/16”) inch (24 mm) thick. The extruded polystyrene/mortar faced laminate may only be used in a Protected Membrane Roof (PMR) design and may not be used under the modified bitumen roofing system.

2.20.2 - Roof Insulation Attachment

A. Roof insulation must be positively attached over an acceptable substrate. The insulation shall be attached in accordance with the requirements of the Designer of Record. Local building codes, insurance underwriters, and other authorities having jurisdiction may have additional fastening requirements to satisfy separate criteria.

B. Refer to Approved Details of this specification for insulation fastening patterns and densities.

C. Mechanical attachment of insulation or coverboard that meets or exceeds the rate of one fastener and plate for every one-point-one-four (1.14 ft²) square feet of contributory area shall be primed with the appropriate primer for hot asphalt, self-adhered, or heat welded membrane systems, i.e. twenty-eight (28) or more fasteners per four foot (4’ x 8’) by eight foot (1.2 m x 2.4 m) board.

2.20.3 - Mechanical Attachment Of Insulation

A. All mechanical fasteners and plates used to attach insulation/coverboard must meet the corrosion resistance requirements of the authority having jurisdiction and Soprema.

B. Mechanical fasteners used to anchor insulation to a roof deck are subject to the following minimum penetration requirements. Fastener penetration is measured from the top surface of the deck and includes the tapping point of the fastener.

- Steel Deck - three-quarter (¾”) inch (19 mm)
Section 2 - General Requirements

- Concrete Deck - one (1") inch (25 mm)
- Wood Plank Deck - three-quarter (¾") inch (19 mm)
- Plywood Deck - three-quarter (¾") inch (19 mm)
- Structural Wood Fiber Decks - one (1") inch (25 mm)
- Poured-In-Place Gypsum & Gypsum Plank Decks - one (1") inch (25 mm)
- Poured-In-Place Lightweight Insulating Concrete Decks (LWIC) - one (1") inch (25 mm)
- Poured-In-Place Lightweight Insulating Cellular Concrete Decks (LWICC) - one (1") inch (25 mm)

C. Presecurement of insulation is required on Soprafix systems. Refer to Section 2.20.6 and the Approved Details of this specification for insulation fastening patterns and densities.

D. Nail attachment of roofing insulation to a nailable deck is not acceptable.

2.20.4 - Hot Asphalt Attachment Of Insulation

A. Hot asphalt may be used to attach insulation to: concrete roof decks; vapor barriers on concrete roof decks; mechanically fastened thermal barriers on metal roof decks; vapor barriers on mechanically fastened thermal barriers; and mechanically fastened base sheets over an acceptable roof deck. Hot asphalt may also be used to attach acceptable coverboards to thermal insulation.

B. The following is required for hot asphalt attachment of insulation:
   - The specified insulation must be approved for asphalt attachment by the insulation manufacturer.
   - The Designer of Record must specify asphalt attachment.
   - The insulation must be attached with ASTM D 312 Type IV asphalt or ASTM D 6152 SEBS Type IV SEBS asphalt.
   - The specified insulation must be compatible with the roof deck, specified asphalt, and Soprema requirements.

C. When insulation and coverboards are thicker than three-quarter (¾") inch (19 mm), the maximum acceptable board dimensions are four feet (4' x 4') by four feet (1.2 m x 1.2 m). Coverboards one-half (½") inch (13 mm) or less can be installed in four foot (4' x 8') by eight foot (1.2 m x 2.4 m) dimensions.

D. Hot asphalt attachment of extruded or expanded polystyrene insulation is not permitted unless the asphalt is permitted to cool to between two hundred and twenty-five and two hundred and fifty (225° to 250° F) degrees Fahrenheit (107° to 121° C) before placement of maximum four (4") inch (102 mm) thick by four (4') feet (1.2 m) square board size. When a coverboard is backmopped to the polystyrene, the asphalt must be permitted to cool to the same temperature range as above.

2.20.5 - Cold Adhesive Attachment Of Insulation

A. Low rise urethane foam adhesives, such as Soprema High Velocity Insulation Adhesive II (HVIA II) and High Velocity Insulation Adhesive III (HVIA III) may be used to attach insulation to concrete, gypsum, cementitious wood fiber and wood decks. HVIA II and HVIA III may also be used to attach thermal insulation to vapor retarders and coverboards to thermal insulation. HVIA II and HVIA III may not be used to attach insulation to steel decks without prior written approval from the Soprema Technical Department.

B. Acceptable insulation, coverboards, as well as their minimum thicknesses, and acceptable vapor retarders, are as follows:
   - Sopraboard - one-eighth (⅛") inch (3.2 mm)
   - High Density Wood Fiberboard - one-half (½") inch (13 mm)
   - Acceptable Gypsum - one-quarter (¼") inch (6.4 mm)
   - Polyisocyanurate - one and one-half (1 ½") inch (38 mm)
Section 2 - General Requirements

- Polystyrene - one (1") inch (25 mm)
- Vapor Retarders - all Soprema sand or granule surfaced modified bitumen sheets, Sopra-G, Modified Sopra-G, Sopra IV, Sopra VI, SopraBase, Sopraglass, Sopra 4897, and acceptable ASTM D 4897 base sheets.

C. The minimum HVIA II and HVIA III ribbon size is one-half (½") inch (13 mm) to three-quarter (¾") inch (19 mm). A larger ribbon size may be required to provide positive contact between the substrate and the acceptable thermal insulation or coverboard.

D. The standard HVIA II and HVIA III ribbon pattern is twelve (12") inches (305 mm) on center. More frequent ribbon spacing may be required on the perimeter and in the corners of the roof as determined by the most current American Society of Civil Engineers (ASCE) Design Calculation Document or the authority having jurisdiction. Contact Soprema for acceptable insulations and patterns for Wind Rider Warranty projects.

E. When insulation and coverboards are thicker than three-quarter (¾") inch (19 mm), the maximum acceptable board dimensions are four feet (4’x4’) by four feet (1.2 m x 1.2 m). Coverboards one-half (½") inch (13 mm) or less can be installed in four foot (4’x8’) by eight foot (1.2 m x 2.4 m) dimensions.

2.20.6 - Presecurement Of Insulation

A. For Soprema roofing systems where the base sheet or base membrane is mechanically fastened, presecurement of the thermal insulation and/or coverboard is required. If both thermal insulation and a coverboard are specified, then only the top layer needs to be presecured.

B. The thermal insulation/coverboard is presecured at the rate of two (2) fasteners and plates for boards measuring two foot (2’x4’) by four foot (610 mm x 1220 mm), four (4) fasteners and plates for boards measuring four foot (4’x4’) by four foot (1.2 m x 1.2 m), and six (6) fasteners and plates for boards measuring four foot (4’x8’) by eight foot (1.2 m x 2.4 m) or greater.

2.20.7 - Thermal Barriers

A. A thermal barrier between the insulation and the roof deck may be required by the local building code. Contact the authority having jurisdiction to determine thermal barrier requirements.

B. Thermal barriers are subject to the same mechanical fastening requirements as thermal insulation if insulation and roofing membrane will be adhered to the thermal barrier. Thermal barriers may be fastened independently or fastened with a common fastener for the entire insulation/thermal barrier assembly.

2.21 - Base Sheets, Base Membranes & Base Sheet/Membrane Attachment

A. Soprema modified bitumen cap membrane plies shall be installed over either an acceptable base sheet, base membrane, ply sheet, or ply membrane. Acceptable base membranes would include all Soprema modified bitumen base membranes. Acceptable base sheets would include Sopra-G, Modified Sopra-G and ASTM D 4897 base sheets. Acceptable ply membranes would include all Soprema modified bitumen base membranes, ply sheets, or base/ply membranes.

B. The base sheet or base membrane side laps shall be three (3") inches (76 mm) or in accordance with the lap line provided by the base sheet or base membrane manufacturer. The base sheet end laps shall be at least six (6") inches (152 mm).

C. Note: In this specification, “base membrane” or “ply membrane” refer to Soprema modified bitumen base and ply sheets; “base sheet” and “ply sheet” refer to Soprema Sopra-G, Modified Sopra-G, Sopra IV, Sopra VI, ESHAvent, Sopra 4897, and SopraBase.
Section 2 - General Requirements

2.21.1 - Hot Asphalt Attachment Of Base Sheets & Base Membranes

A. Hot asphalt applied base sheets shall be installed with a full interply mopping rate of twenty-five (25 lbs.) pounds per one hundred (100) square feet (1.2 kg/m²) to an acceptable substrate. The flow of hot asphalt shall be visible at the side and end laps.

B. Hot asphalt attachment is only acceptable on base sheets with sand on the bottom side of the sheet.

C. Base membranes and base sheets shall be hot asphalt attached directly to a primed structural concrete deck or acceptable coverboard. Acceptable coverboards include Sopraboard, Perlite, High Density Wood Fiberboard, and acceptable Gypsum boards. Base membranes and base sheets may not be hot asphalt applied directly to thermal insulation.

2.21.2 - Heat Welded Attachment Of Base Membranes

A. Heat welded attachment of base membranes shall be accomplished with even heat distribution across the entire width of the sheet. There shall be enough heat applied to the back of the sheet so that a small flow of asphalt precedes the roll as it is installed. The flow of asphalt shall be visible and should ooze out at the side lap.

B. Heat welded attachment is only acceptable on base membranes with plastic burn-off film on the bottom side of the sheet or base membranes designated as being “high brush” sanded.

C. Heat welding attachment of base membranes is only acceptable with Sopraboard or acceptable Gypsum as the coverboard. Base membranes may not be heat welded directly to thermal insulation.

2.21.3 - Cold Adhesive Attachment Of Base Sheets & Base Membranes

A. Base sheets and base membranes shall be installed with Soprema FM Adhesive Squeegee Grade (VOC), FM Adhesive Squeegee Grade, FM Adhesive Squeegee Grade (VOC-1) or High Velocity Membrane Adhesive at the published rate of one and one-half to two gallons (1.5 to 2 gal./100 ft²) per one hundred (100) square feet (0.61 to 0.82 L/m²) on nonporous surfaces and at the rate of two to two and one-half gallons (2 to 2.5 gal./100 ft²) per one hundred (100) square feet (0.82 to 1.02 L/m²) on porous surfaces. The application is limited to fifty (50° F) degrees Fahrenheit (10° C) ambient temperature and a seventy-two (72) hour wait between the application of the base membrane ply and the cap membrane ply. The slope limitation is one-half (½:12) inch per horizontal foot (4%) without special provisions for membrane fastening, roll length and special acceptance from the Soprema Technical Department.

B. Soprema FM Adhesive (VOC), FM Adhesive Squeegee Grade, or FM Adhesive Squeegee Grade (VOC-1) may be applied to Sopraboard, Perlite, High Density Wood Fiberboard, or acceptable Gypsum. High Velocity Membrane Adhesive may be applied to all of the above except Perlite. Base sheets and base membranes may not be cold adhesive applied directly to thermal insulation without prior written approval from the Soprema Technical Department.

C. Soprema FM Adhesive and High Velocity Membrane Adhesive are squeegee applied. Soprema FM Adhesive Squeegee Grade may be squeegee or spray applied. Soprema recommends a one-quarter (¼”) inch (6.4 mm) notched squeegee. At the three (3”) inch (76 mm) wide side laps and six (6”) inch (152 mm) wide end laps the adhesive shall be installed so that a one-quarter (¼”) inch (6.4 mm) wide bead of adhesive is visible. As an option, the side and end laps may be hot air welded.

D. Asphalt based cold adhesives applied modified bitumen systems over EPS require as solvent resistant barrier between the EPS and the coverboard and written permission from the Soprema Technical Department. Contact the Soprema Technical Department for more information.
Section 2 - General Requirements

2.21.4 - Ribbon Strip Attachment Of Base Membranes

A. Polyester reinforced base membranes may also be spot attached with Soprema High Velocity Membrane Adhesive II in one-half (½”) inch to three-quarter (¾”) inch wide (13 mm - 19 mm) beads twelve (12”) inches (305 mm) on center in the field of the roof, six (6”) inches (152 mm) on center in the perimeter and three (3”) inches (76 mm) in the corners of the roof.

B. Polyester reinforced base membranes shall be installed with ribbon strips of asphalt as specified by the Designer Of Record.

2.21.5 - Partial Heat Welded Attachment Of Base Membranes

A. The Soprema Colvent TG series of membranes may be partially heat welded to acceptable structural concrete, Poured-In-Place Lightweight Insulating Cellular Concrete Decks (LWICC). Structural concrete decks must be primed with Soprema Elastocol 400 or 500 Primer or other ASTM D 41 asphalt primer at the rate of one (1) gallon per one hundred (100 - 150 ft²/gal) to one hundred and fifty square feet (.41 to .61 L/m²). See section 2.12.10 for priming requirements over LWICC.

B. Heat welding of Colvent TG shall be accomplished with even heat distribution across the entire width of the sheet. There shall be enough heat applied to the back of the sheet so that a small flow of asphalt precedes the roll as it is installed. The bead of asphalt shall be visible and should ooze out at the side lap.

C. Colvent TG base membranes must not be totally heat welded to the substrate on the end lap when work is over for the shift or day. The channels between the heat welded strips must continue from one base membrane to the adjoining sheet for the “venting” function of the Colvent to occur on the completed system. If the Colvent TG end lap is fully heat welded to the substrate as a nightly tie-off, the fully heat welded portion of the end lap must be removed before work resumes.

D. Colvent TG used for flashing on parapet walls must be installed so that the channels are perpendicular to the plane of the roof.

2.21.6 - Mechanical Attachment Of Base Sheets With Screw Fasteners & Disks

A. Mechanical attachment of base sheets with screws and plates will vary in fastening frequency and pattern depending on the Soprema base sheet, the system design, the wind resistance requirements of the project, and the roof deck. Refer to the Approved Details section of this specification for base sheet fastening patterns and densities.

B. Fasteners and plates must meet corrosion resistance criteria of FMG 4470.

2.21.7 - In-Seam Mechanical Attachment Of Base Membranes With Screw Fasteners & Disks

A. Fastener frequency for in-seam mechanical attachment of base membranes with screws and plates will vary depending on the system design, the wind resistance requirements of the project, and the roof deck. Additional rows of fasteners and plates in the field, perimeter, and corners in the width of the sheets will be dependant on the same factors as above. Refer to the Approved Details section of this specification for in-seam base membrane fastening patterns and densities.

B. Refer to Section 2.20.6 - “Presecurement of Insulation” for insulation presecurement requirements.

C. In-seam mechanical attachment of base membranes is limited to those sheets designated by Soprema as being acceptable for this attachment method.

D. Fasteners and plates for in-seam fastening must be provided by Soprema.
E. As an alternate, in-seam mechanical attachment may be accomplished with Soprema metal or polymer batten bars. Refer to the Approved Details section of this specification for in-seam base membrane fastening patterns and densities.

2.21.7.1 - Soprafix With Heat Sealed Side Lap - Heat Welded Or Self-Adhered Cap

A. The application of the mechanically fastened base membrane is limited to the aforementioned approved decks in combination with documented withdrawal resistance testing, if applicable. For increase density in the corner and perimeter see the Approved Details section in this specification.

B. The cap membrane must be run with the end laps and side laps staggered a minimum of twelve (12") inches (305 mm) from the base membrane end and side laps. If utilizing side lap technique “A” as described in section 3.15.2, either the cap membrane should be ordered with a five (5") inch (127 mm) side lap or the cap membrane must be laid out with a periodic one-half (½) sheet to compensate for the side dimension variation between the cap membrane and the Soprafix base. The slope limitation is two (2") inches to the horizontal foot (17%) without special provisions for fastening, roll length, and special acceptance from the Soprema Technical Department.

Note: Side lap welding technique “A” described in section 3.15.2 of this specification is mandatory on all applications which involve field uplift pressures in excess of either -30 psf or on projects requiring greater than 63 mph wind warranties and with all self-adhered cap membranes.

2.21.7.2 - Soprafix With Self-Adhered Side Lap & Self-Adhered Cap

A. See Section 3.15.3 for Soprafix-e self-adhered side lap installation techniques.

2.21.8 - Mechanical Attachment With Manually Driven Fasteners and Disks

A. Base sheet attachment with manually driven fasteners and disks will vary depending on the deck type, the system design, and the wind resistance requirements of the project. Refer to the Approved Details section of this specification for base sheet fastening patterns and densities.

2.21.9 - Self-Adhered Attachment Of Base Membrane

A. Self-adhered base membranes may be applied directly to concrete, Sopraboard, acceptable Gypsum board, and the top sanded surface of in-place base membrane. Elastocol 400, 500, or 600c Primer, or other ASTM D 41 asphalt primer, is required on all surfaces prior to the installation of self-adhered base membrane. In some cases, Soprema Elastocol 600c Primer may be required on all surfaces prior to the installation of the self-adhered base membrane. Contact the Soprema Technical Department at for more information.

B. The cap sheet over self-adhered base membranes may be heat welded, hot mopped, self-adhesive, or cold adhesive applied.

2.21.9.1 - Partial Self-Adhered Attachment Of Base Membrane

A. The Soprema Colvent SA series of membranes may be partially adhered to acceptable structural concrete, Poured-In-Place Lightweight Insulating Cellular Concrete Decks (LWICC). Structural concrete decks must be primed with Soprema Elastocol 400, 500, or 600c Primer, or other ASTM D 41 asphalt primer at the rate of one (1) gallon per one hundred (100 - 150 ft²/gal) to one hundred and fifty square feet (.41 to .61 L/m²). See section 2.12.10 for priming requirements over LWICC.

B. Colvent SA base membranes must not be totally sealed to the substrate on the end lap when work is over for the shift or day. The channels between the heat welded strips must continue from one base membrane to the adjoining sheet for the “venting” function of the Colvent to occur on the completed system. If the Colvent...
SA end lap is fully sealed to the substrate as a nightly tie-off, the fully sealed portion of the end lap must be removed before work resumes.

C. Colvent SA used for flashing on parapet walls must be installed so that the channels are perpendicular to the plane of the roof.

2.21.10 - Anchor Sheet Attachment

A. Anchor sheet(s) which are attached to the structural deck and are used to attach insulation systems, whether they are fiberglass or SBS sheet(s), mechanically attached or adhered. Applications must be accepted in advance by the Soprema Technical Department. Approved fiberglass anchor sheets are Sopra G or Modified Sopra G or any alternative product included in Soprema’s current agency or building code approvals. Approved SBS anchor membranes are Elastophene 180 Sanded, Sopralene 180 Sanded, or Sopralene 180 SP 3.5 mm.

B. Whether mechanically attached, heat welded, cold adhered, or hot attached (see individual application procedure), the base sheet or membrane must have a minimum three (3”) inch (76 mm) side lap and a six (6”) inch (152 mm) end lap. After installation of the base sheet or base membrane, and before the application of the insulation system, all fishmouths, ridges, and voids must be repaired and/or replaced.

2.21.10.1 - Base Anchor Sheet Application

A. This applies to base sheets, either fiberglass or SBS, that are mechanically attached or adhered directly to the structural deck and are used to directly attach membrane systems to the structural deck system. Approved fiberglass anchor sheet(s) are: Sopra-G, Modified Sopra-G Soprabase, Sopra 4897, or any alternative product included in Soprema’s current agency or building code approvals. Approved SBS base membranes are: Elastophene 180 Sanded, Elastophene 180 PS, Sopralene 180 Sanded, Sopralene 180 SP 3.5 mm, or Sopralene 180 SP. Applications must be accepted by the Soprema Technical Department in advance. If mechanically fastened, care must be taken not to over tighten or overdrive the fastener through the fiberglass base sheet. Long term warranties may require a heavy duty venting base sheet.

2.21.10.2 - Base Sheet Used As Temporary Or Dry-In Roofing

A. It is not advisable to use only one (1) ply of fiberglass base sheet as a temporary roof. The minimum anchor sheet or base sheet configuration to qualify for use as a temporary or dry-in roof are two (2) plies of Sopra IV, Sopra VI, or Sopra-G applied in hot asphalt or one (1) ply of SBS base membrane applied by heat welding, hot asphalt or cold adhesive. The following guidelines apply: a) the application must be accepted prior to the installation and b) the time limit for two (2) fiberglass plies is one week and the time limit for one (1) ply of SBS membrane is one (1) month.* A glaze coat is required when the temporary roof is made with fiberglass base or ply sheets.

*The film surfacing on some SBS base membranes may be subject to releasing from the membrane if exposed to ultraviolet light for as little as two weeks. Left unattended, this may result in the temporary clogging of internal roof drains under certain conditions. If exposure of the temporary is anticipated to be longer than two weeks, then a high brush sanded base membrane should be used.

B. When a base sheet or base ply membrane is used as a dry-in sheet prior to the application of a new LWIC or LWICC pour, and Soprema does not know the pressure design of the existing structural decking; the pressure design of the existing LWICC; or the fastener securement ability into the existing LWICC. Consequently, Soprema’s Wind Rider only applies to the new roof assembly, i.e. the new mechanically fastened base sheet into the new LWICC, new mopped insulation (if applicable), and the SBS membrane plies. Any deviation from this must be accepted, in writing by the Soprema Technical Department, prior to bid.
C. It is the responsibility of the Designer Of Record to determine if an assembly using an anchor sheet into an existing LWICC, followed by a dry-in sheet (heat welded, hot mopped or cold applied), followed by a new cast of LWICC meets the applicable building code velocity pressure requirements for that specific project.

2.22 - Ply Membrane

A. Soprema modified bitumen ply membranes shall be installed over either an acceptable base sheet or base membrane. Acceptable base membranes would include all Soprema modified bitumen base membranes; acceptable base sheets would include Soprar-G, Modified Soprar-G, Soprabase, and Sopra 4897 base sheets.

B. The ply sheet side laps shall be three (3”) inches (76 mm) or in accordance with selvedge provided on the ply sheet. The ply sheet end laps shall be at least six (6”) inches (152 mm).

C. The only circumstances where a granular surfaced cap sheet would not be required are roofs where a flood coat and gravel or a Protected Membrane Roof design is specified.

2.22.1 - Hot Asphalt Attachment Of Modified Bitumen Ply Membrane

A. Hot asphalt applied cap membrane shall be installed with a full interply mopping rate of twenty-five (25 lbs.) pounds per one hundred (100) square feet (1.2 kg/m²) to a base membrane or base sheet. The flow of hot asphalt shall be visible at the side and end laps. Loose granules shall be broadcast into the asphalt bleedout while the asphalt is still hot if required by the project specifications.

B. Hot asphalt attachment is only acceptable on ply membranes with sand on the bottom side of the sheet.

C. Ply membranes shall be hot asphalt attached directly to a base membrane or base sheet. Acceptable base membranes include all Soprema modified bitumen base sheets; and acceptable base sheets would include Soprar-G, Modified Soprar-G, Soprabase, and Sopra 4897 base sheets.

2.22.2 - Heat Welded Modified Bitumen Ply Membrane

A. Heat welded attachment of ply membranes shall be accomplished with even heat distribution across the entire width of the sheet. There shall be enough heat applied to the back of the sheet so that a small flow of asphalt precedes the roll as it is installed. The bead of asphalt shall be visible and should ooze out at the side lap.

B. Heat welded attachment is only acceptable to base membranes with plastic burn-off film on the top side of the sheet or high brush sanded base membranes.

C. Heat welding attachment of ply membranes is acceptable with all Soprema modified bitumen base membranes with plastic burn-off film on the bottom side of the sheet.

2.22.3 - Cold Process Applied Modified Bitumen Ply Membrane

A. Ply membranes shall be installed with Soprema FM Adhesive Squeegee Grade (VOC), FM Adhesive Squeegee Grade, FM Adhesive Squeegee Grade (VOC-1), or High Velocity Membrane Adhesive at the published rate of one and one-half to two gallons (1.5 to 2 gal./100 ft²) per one hundred (100) square feet (0.61 to 0.82 L/m²) on nonporous surfaces and at the rate of two to two and one-half gallons (2 to 2.5 gal./100 ft²) per one hundred (100) square feet (0.82 to 1.02 L/m²) on porous surfaces.

B. Cold process attachment is only acceptable on ply membranes with sand finish on the bottom side.

C. Ply membrane shall be cold process attached directly to a base sheet or base membrane. Acceptable base sheets and base membranes include all Soprema modified bitumen base membranes with a sanded top surface; acceptable base sheets include Soprar-G, Modified Soprar-G, Sopra IV, and Sopra VI.
Section 2 - General Requirements

D. Soprema FM Adhesive Squeegee Grade (VOC), FM Adhesive Squeegee Grade (VOC-1) and High Velocity Membrane Adhesive are squeegee applied. Soprema FM Adhesive Squeegee Grade may be squeegee or spray applied. Soprema recommends a one-quarter (¼”) inch (6.4 cm) notched squeegee. At the three (3”) inch (76 mm) wide side laps and six (6”) inch (152 mm) wide end laps the adhesive shall be installed so that a one-quarter (¼”) inch (6.4 mm) wide bead of adhesive is visible. As an option, the side and end laps may be hot air welded.

E. Caution: Three ply cold adhesive applied modified bitumen systems are limited with regard to the ambient temperature range in which they can be applied. Contact the Soprema Technical Department for more information.

2.22.4 - Self-Adhered Applied Modified Bitumen Ply Membrane

A. Self-Adhered ply membranes may be applied directly to selected sand surfaced base membranes. Elastocol 400, 500, or 600c Primer, or other accepted primer, is required on the base membrane prior to the installation of self-adhered ply membranes.

2.23 - Cap Membrane

A. Soprema modified bitumen cap membranes shall be installed over either an acceptable base sheet, base membrane, ply sheet or ply membrane. Acceptable base membranes would include all Soprema modified bitumen base membranes; acceptable base sheets would include Sopra-G, Modified Sopra-G, Soprabase, and Sopra 4897 base sheets. Acceptable ply sheets would include all Soprema modified bitumen base membranes, ply membranes, or ply sheets.

B. The cap membrane side laps shall be three (3”) inches (76 mm) or in accordance with selvedge provided on the cap membrane. The cap membrane end laps shall be at least twelve (12”) inches (152 mm).

C. The only circumstances where a granular surfaced cap membrane would not be required are roofs where a flood coat and gravel or a Protected Membrane Roof design is specified.

2.23.1 - Hot Asphalt Attachment Of Modified Bitumen Cap Membrane

A. Hot asphalt applied cap membrane shall be installed with a full interply mopping rate of twenty-five (25 lbs.) pounds per one hundred (100) square feet (1.2 kg/m²) to an acceptable substrate. The flow of hot asphalt shall be visible at the side and end laps. Loose granules shall be broadcast into the asphalt bleedout while the asphalt is still hot.

B. Hot asphalt attachment is only acceptable on cap membranes with sand on the bottom side of the sheet.

C. Cap membranes shall be hot asphalt attached directly to a base sheet, base membrane, ply sheet, or ply membrane. Acceptable base and ply membranes include all Soprema modified bitumen base sheets with sanded surfaces; acceptable base and ply sheets include Sopra-G, Modified Sopra-G, Soprabase, Sopra 4897, Sopra IV, and Sopra VI.

D. Unilay, Unilay-e FR, and Unilay 180 FR GR are the only Soprema cap membrane that may be installed directly over insulation or coverboard.

2.23.2 - Heat Welded Modified Bitumen Cap Membrane

A. Heat welded attachment of cap membrane shall be accomplished with even heat distribution across the entire width of the sheet. There shall be enough heat applied to the back of the sheet so that a small flow of asphalt precedes the roll as it is installed. The bead of asphalt shall be visible and should ooze out at the side lap.
B. Heat welded attachment is only acceptable on cap membrane with plastic burn-off film on the bottom side of the sheet or a high brush sanded bottom surface.

C. Heat welding attachment of cap membrane is acceptable with all Soprema modified bitumen base and ply membranes, Sopra IV and Sopra VI ply sheets.

2.23.3 - Cold Process Applied Modified Bitumen Cap Membrane

A. Cap sheets shall be installed with Soprema FM Adhesive Squeegee Grade (VOC), FM Adhesive Squeegee Grade, FM Adhesive Squeegee Grade (VOC-1), or High Velocity Membrane Adhesive at the published rate of one and one-half to two gallons (1.5 to 2 gal./100 ft²) per one hundred (100) square feet (0.61 to 0.82 L/m²) on nonporous surfaces and at the rate of two to two and one-half gallons (2 to 2.5 gal./100 ft²) per one hundred (100) square feet (0.82 to 1.02 L/m²) on porous surfaces.

B. Cold process attachment is only acceptable on cap membranes with sand finish on the bottom side.

C. Cap membrane shall be cold process attached directly to a base sheet, base membrane, ply sheet, or ply membrane. Acceptable base and ply membranes include all Soprema modified bitumen base sheets; acceptable base and ply sheets include Sopra-G, Modified Sopra-G, Soprabase, Sopra 4897, Sopra IV, and Sopra VI.

D. Soprema FM Adhesive Squeegee Grade (VOC), FM Adhesive Squeegee Grade (VOC-1) and High Velocity Membrane Adhesive are squeegee applied. Soprema FM Adhesive Squeegee Grade may be squeegee or spray applied. Soprema recommends a one-quarter (¼") inch (6.4 cm) notched squeegee. At the three (3") inch (76 mm) wide side laps and six (6") inch (152 mm) wide end laps the adhesive shall be installed so that a one-quarter (¼") inch (6.4 mm) wide bead of adhesive is visible. As an option, the side and end laps may be hot air welded.

E. Polyester reinforced cap membranes may also be spot attached with Soprema High Velocity Membrane Adhesive II in one-half (½") inch to three-quarter (¾") inch wide (13 mm - 19 mm) beads twelve (12") inches (305 mm) on center in the field of the roof, six (6") inches (152 mm) on center in the perimeter and three (3") inches (76 mm) in the corners of the roof.

F. Polyester reinforced base membranes shall be installed with ribbon strips of asphalt as specified by the Designer Of Record.

2.23.4 - Self-Adhered Applied Modified Bitumen Cap Membrane

A. Self-Adhered cap membranes may be applied directly to selected sand surfaced base membranes or ply membranes. Elastocol 400 or 500 Primer, or other accepted primer, is required on the base or ply membrane and all metal and masonry surfaces prior to the installation of self-adhered cap membranes.

2.23.5 - Modified Bitumen Membranes Over In-Seam Mechanically Attached Base Sheets

A. Cap sheets over in-seam mechanically attached base membranes may be heat welded, hot asphalt attached, cold process applied, or self-adhered.

2.24 - Steep Slope Fastening Requirements

A. Additional cap membrane fastening is not required for roofs with slopes of one-half (½:12) inch per horizontal foot (4%) or less.

B. For roof slopes greater than one-half (½:12) inch per horizontal foot (4%) the base sheets or base membranes shall be applied with the length of the base sheet parallel to the slope of the roof.
Section 2 - General Requirements

C. All fastening into wood blocking shall be accomplished with annular ring or spiral shank nails with one (1") inch (25 mm) diameter heads and a minimum of one (1") inch (25 mm) in length. As an alternate, (1") inch (25 mm) diameter heads and a minimum of one (1") inch (25 mm) in length. As an alternate, fastening may be accomplished with Soprema Soprafix plates and fasteners.

D. On steep sloped roofs where additional fastening is required, wood nailers with minimum nominal dimensions of two inches (2" x 4") by four inches (51 mm x 102 mm) shall be installed perpendicular to the roof slope. The wood nailers shall match the thickness of the insulation and be installed in accordance with section 2.19 of this specification. As an alternate, shop fabricated metal channels may be used in lieu of wood nailers to achieve blocking requirements.

2.24.1 - Hot Asphalt Applied Base Membrane & Cap Membrane

A. For roof slopes between one-half (½:12) inch per horizontal foot (4%) and two (2") inches per horizontal foot (17%), hot asphalt applied cap membranes shall be fastened with four (4) equally spaced fasteners at a wood nailer spacing of thirty-two (32') feet (9.75 m) on center. The cap membrane fasteners shall be installed in staggered fashion and encapsulated within the cap membrane end laps.

B. Hot asphalt applied base membrane and cap membrane applied systems are not recommended on roofs where the slope exceeds one (1") inch per horizontal foot (8%).

2.24.2 - Hot Asphalt Applied Base Membrane & Heat Welded Cap Membrane

A. For roof slopes between one-half (½:12) inch per horizontal foot (4%) and two (2") inches per horizontal foot (17%), hot asphalt applied cap membranes shall be fastened with four (4) equally spaced fasteners at a wood nailer spacing of thirty-two (32') feet (9.75 m) on center. The cap membrane fasteners shall be installed in staggered fashion and encapsulated within the cap membrane end laps.

B. Hot asphalt applied base membrane applied systems are not recommended on roofs where the slope exceeds one (1") inch per horizontal foot (8%).

2.24.3 - Heat Welded Base Membrane & Cap Membrane

A. For roof slopes greater than two (2:12) inches per horizontal foot (17%) and less than three (3") inches per horizontal foot (25%), heat welded cap membranes shall be fastened with four (4) equally spaced fasteners at a wood nailer spacing of twenty-four (24') feet (7.3 m) on center. The cap membrane fasteners shall be installed in staggered fashion and may be encapsulated within the cap membrane end laps.

B. For roof slopes greater than three (2:12) inch per horizontal foot (25%) and less than six (6") inches per horizontal foot (50%), heat welded cap membranes shall be fastened with four (4) equally spaced fasteners at a wood nailer spacing of sixteen (16') feet (4.9 m) on center. The cap membrane fasteners shall be installed in staggered fashion and may be encapsulated within the cap membrane end laps.

C. For roof slopes greater than six (6:12) inch per horizontal foot (50%) and less than twelve (12") inches per horizontal foot (100%), heat welded cap membranes shall be fastened with four (4) equally spaced fasteners at a wood nailer spacing of twelve (12') feet (3.7 m) on center. The cap membrane fasteners shall be installed in staggered fashion and may be encapsulated within the cap membrane end laps.

D. For roof slopes greater than twelve (12:12) inch per horizontal foot (100%) heat welded cap membranes shall be fastened with four (4) equally spaced fasteners at a wood nailer spacing of four (4') feet (1.2 m) on center. The cap membrane fasteners shall be installed in staggered fashion and may be encapsulated within the cap membrane end laps.
2.24.4 - Cold Process Applied Base Membrane & Cap Membrane

A. For roof slopes between one-half (½:12) inch per horizontal foot (4%) and one (1") inch per horizontal foot (8%), some fastening may be necessary to stabilize the sheets until the adhesive cures.

B. For roof slopes greater than one (1:12) inches per horizontal foot (8%) and less than two (2") inches per horizontal foot (17%), cold process cap membranes shall be fastened with four (4) equally spaced fasteners at a wood nailer spacing of twenty-four (24') feet (7.3 m) on center. The cap membrane fasteners shall be installed in staggered fashion and encapsulated within the cap membrane end laps.

C. For roof slopes greater than two (2:12) inches per horizontal foot (17%) and less than three (3") inches per horizontal foot (25%), cold process cap membranes shall be fastened with four (4) equally spaced fasteners at a wood nailer spacing of sixteen (16') feet (4.9 m) on center. The cap membrane fasteners shall be installed in staggered fashion and may be encapsulated within the cap membrane end laps.

D. For roof slopes greater than three (2:12) inch per horizontal foot (25%) and less than six (6") inches per horizontal foot (50%), cold process cap membranes shall be fastened with four (4) equally spaced fasteners at a wood nailer spacing of sixteen (16') feet (4.9 m) on center. The cap membrane fasteners shall be installed in staggered fashion and may be encapsulated within the cap membrane end laps.

E. For roof slopes greater than six (6:12) inch per horizontal foot (50%) and less than twelve (12") inches per horizontal foot (100%), cold process cap membranes shall be fastened with four (4) equally spaced fasteners at a wood nailer spacing of twelve (12') feet (3.7 m) on center. The cap membrane fasteners shall be installed in staggered fashion and may be encapsulated within the cap membrane end laps.

2.24.5 - Mechanically Fastened Soprafix Base Membrane & Heat Welded Or Self-Adhered Cap Membrane

A. For roof slopes greater than two (2:12) inches per horizontal foot (17%) and less than three (3") inches per horizontal foot (25%), heat welded cap membranes shall be fastened with four (4) equally spaced fasteners at a wood nailer spacing of twenty-four (24') feet (7.3 m) on center. The cap membrane fasteners shall be installed in staggered fashion and may be encapsulated within the cap membrane end laps.

B. For roof slopes greater than three (2:12) inch per horizontal foot (25%) and less than six (6") inches per horizontal foot (50%), heat welded cap membranes shall be fastened with four (4) equally spaced fasteners at a wood nailer spacing of sixteen (16') feet (4.9 m) on center. The cap membrane fasteners shall be installed in staggered fashion and may be encapsulated within the cap membrane end laps.

C. For roof slopes greater than six (6:12) inch per horizontal foot (50%) and less than twelve (12") inches per horizontal foot (100%), heat welded cap membranes shall be fastened with four (4) equally spaced fasteners at a wood nailer spacing of twelve (12') feet (3.7 m) on center. The cap membrane fasteners shall be installed in staggered fashion and may be encapsulated within the cap membrane end laps.

D. For roof slopes greater than twelve (12:12) inch per horizontal foot (100%) heat welded cap membranes shall be fastened with four (4) equally spaced fasteners at a wood nailer spacing of four (4') feet (1.2 m) on center. The cap sheet fasteners shall be installed in staggered fashion and may be encapsulated within the cap membrane end laps.

2.24.6 - Self-Adhered Base & Cap Membrane

A. For roof slopes greater than two (2:12) inches per horizontal foot (17%) and less than three (3") inches per horizontal foot (25%), heat welded cap membranes shall be fastened with four (4) equally spaced fasteners at a wood nailer spacing of twenty-four (24') feet (7.3 m) on center. The cap membrane fasteners shall be installed in staggered fashion and encapsulated within the cap membrane end laps.
Section 2 - General Requirements

B. For roof slopes greater than three (2:12) inch per horizontal foot (25%) and less than six (6") inches per horizontal foot (50%), heat welded cap membranes shall be fastened with four (4) equally spaced fasteners at a wood nailer spacing of sixteen (16’) feet (4.9 m) on center. The cap membrane fasteners shall be installed in staggered fashion and may be encapsulated within the cap membrane end laps.

C. For roof slopes greater than six (6:12) inch per horizontal foot (50%) and less than twelve (12") inches per horizontal foot (100%), heat welded cap membranes shall be fastened with four (4) equally spaced fasteners at a wood nailer spacing of twelve (12’) feet (3.7 m) on center. The cap membrane fasteners shall be installed in staggered fashion and may be encapsulated within the cap membrane end laps.

D. For roof slopes greater than twelve (12:12) inch per horizontal foot (100%) heat welded cap membranes shall be fastened with four (4) equally spaced fasteners at a wood nailer spacing of four (4’) feet (1.2 m) on center. The cap sheet fasteners shall be installed in staggered fashion and may be encapsulated within the cap membrane end laps.

2.25 - Protected Membrane Roof (PMR) Assemblies

A. All information within this section shall be considered as part of the PMR specification.

B. All flashing must conform to the requirements stated within this section. The flashing material must extend a minimum of eight (8") inches (203 mm) above the extruded polystyrene insulation.

C. Extruded polystyrene insulation boards shall be installed with drainage channels down. If the styrene has a ribbed surface, then the board shall be installed with the ribbed surface up.

D. A filter fabric is required between the extruded polystyrene and the ballast. Acceptable filter fabrics would include, but not be limited to, Soprema Sopra Filter Fabric TXC-75.

E. In order to provide proper protection against wind uplift of the insulation, all ballast shall be of appropriate size and weight. The Designer Of Record is responsible for the ballast design and selection on a specific installation. The weight of the ballast must be considered when determining the structure’s capability to support the load of the completed roof installation, as well as other expected loads. Soprema assumes no responsibility for conducting structural analysis and strongly recommends that a design professional make this determination prior to starting the project.

F. The stone ballast shall be free of dirt, sand, and other foreign matter and be water worn with smooth rounded edges. The stone ballast shall conform to ASTM D 448, size #4 using ASTM C 136 method of testing. The stone ballast shall be nominal three-quarter (¾") inch to one and one-half (1 ½") inch (19 to 38 mm) diameter stone. The ballast is applied at a minimum rate of approximately ten (10) to twelve (12) pounds (48.8 to 58.6 kg/m²) per square foot in the field of the roof and over the polystyrene insulation and a layer of filter fabric. The ballast is applied at a minimum rate of approximately twenty (20 lbs/ft²) pounds per square foot (97.6 kg/m²) over a four (4’) foot (1.22 m) wide area at the roof perimeter and around all penetrations.

G. Pavers with a smooth metal trowel finish may be used in lieu of ballast and shall be applied at a minimum rate of not less than fifteen (15 lbs/ft²) per square foot (6.8 kg/m²). Pavers or concrete blocks shall be of the type that will be resistant to long term weathering. The pavers shall be spaced a maximum of one-half (½") inch (13 mm) apart. Pavers must be positioned on supports or pedestals. The supports or pedestals may be six (6") inch (152 mm) squares of Soprema Soprawalk or other commercially available products designed for this purpose. These supports shall be located at the intersections of the corners of the pavers, i.e. where the four corners meet, where all four pavers rest on the same square of support or pedestal. A filter fabric, such as those described above, is required between the polystyrene insulation and the paver supports. As an alternate to pedestals, extruded polystyrene with ribs on the top surface and channels on the bottom surface, may be used.
H. Interlocking pavers weighing a minimum of ten (10 lbs/ft²) pounds per square foot (48.8 kg/m²), which have documented proof of performance for wind and weather resistance, may be used. This factory engineered paver system shall have a minimum performance warranty from the system manufacturer equal to the Soprema warranty. A filter fabric, such as those described above, is required between the polystyrene insulation and the paver supports.

I. Crushed stone ballast is permitted when it is free of excessive fractures, dirt, and other foreign matter. Crushed stone shall be durable and meet the following physical testing requirements:

Specific Gravity: Minimum 2.4 mg/m² using ASTM C 127 test method.
Impact Resistance: Maximum 40% weight loss using ASTM C 535 and C 131 test methods.
Soundness: Maximum 12% weight loss with sodium sulfate and ASTM C 88 test method. Maximum 18% weight loss with magnesium sulfate and ASTM C 88 test method.

J. Ten pounds (10 lbs/ft²) per square foot (48.8 kg/m²) will not provide adequate ultraviolet protection for the filter fabric if stone larger than ASTM D 488, size #4 is used. The following chart provides information regarding minimum coverages for several common ballast sizes:

<table>
<thead>
<tr>
<th>ASTM Size Number</th>
<th>Nominal Size</th>
<th>Minimum Acceptable Coverage</th>
</tr>
</thead>
<tbody>
<tr>
<td>4</td>
<td>¾” to 1 ½” (19 to 38 mm)</td>
<td>10 lbs/ft² (48.8 kg/m²)</td>
</tr>
<tr>
<td>357</td>
<td>¾” to 2” (19 to 51 mm)</td>
<td>10 lbs/ft² (48.8 kg/m²)</td>
</tr>
<tr>
<td>3</td>
<td>1” to 2” (25 to 51 mm)</td>
<td>10 lbs/ft² (48.8 kg/m²)</td>
</tr>
<tr>
<td>24</td>
<td>¾” to 2 ½” (19 to 64 mm)</td>
<td>11 lbs/ft² (53.7 kg/m²)</td>
</tr>
<tr>
<td>2</td>
<td>1 ½” to 2 ½” (38 to 64 mm)</td>
<td>13 lbs/ft² (63.4 kg/m²)</td>
</tr>
<tr>
<td>1</td>
<td>1 ½” to 3 ½” (38 to 89 mm)</td>
<td>16 lbs/ft² (78 kg/m²)</td>
</tr>
</tbody>
</table>

K. Precast and prestressed concrete decks, including single and double “T’s” require a minimum of one layer of acceptable insulation as a leveling course prior to the installation of the roof system.

L. When installing a PMR system over a steel or wood deck, the Designer Of Record is responsible for determining whether or not a thermal barrier is required by local building codes.

2.26 - Cant Strips

A. When specified by the Designer of Record, cant strips are required where indicated.

B. Soprema requires cant strips on hot asphalt of cold adhesive applied modified bitumen systems. Soprema does not require, nor recommend, combustible cant strips when flashing base membranes are either heat welded or self-adhered.

C. Cant strips must be either mechanically fastened or adhered in place prior to flashing. Cant strips may be set in hot asphalt, adhered with cold adhesive, or anchored with screw or acceptable manually driven fasteners. Common nails are not acceptable manually driven fasteners.

D. Cant strips may be made of wood, perlite, fiberglass, or concrete. The face of the cant strip shall have an incline of forty-five (45°) degrees with the roof. Cant strips shall extend a minimum of four (4”) inches (102 mm) both vertically and horizontally. Wood cant strips must meet the same rot resistance criteria as wood nailers as described in Section 2.19 of this specification.

E. Cant strips shall be adhered or mechanically fastened over roof insulation or wood nailers, be neatly fitted at joints and mitered at inside and outside corners.

F. Some cant strips are composed of combustible materials. The decision on which material is most appropriate
Section 2 - General Requirements

2.27 - Flashing

A. To properly seal the edges of a roofing system, a flashing system is required at all roof penetrations and perimeters. Polyester reinforced flashing material is required as the top layer in all flashing details except where Sopralast has been specified by the Designer of Record. When Sopralast has been specified, a polyester reinforced flashing base membrane is required.

B. The designed flashing height on new construction shall be a minimum of eight (8”) inches (203 mm) above the surface of the roof. In all cases, the designed flashing height shall be higher than the potential water level that may be encountered as a result of a torrential rain. Exception: The required minimum height for penetration pockets is four (4”) inches (102 mm) above the surface of the roof.

C. Flashing height of a hot mopped, heat welded, or cold adhesive applied membrane base flashing can not exceed twenty-four (24”) inches (610 mm) without additional design considerations. Additional design considerations would include supplemental fastening on the base ply of flashing material. Caution: The roofing applicator must be certain that the new flashing material is not being installed over weep holes, existing through wall flashings, or overflow scuppers.

D. All masonry, block, brick, and metal construction materials that come in to contact with flashing material must be primed with Elastocol 400, 500 or other ASTM D 41 primer. Elastocol 600c primer is required when self-adhered products are used for flashing. The maximum acceptable flashing height for self-adhered membranes is two (2’) feet (610 mm).

E. Through-wall flashings are recommended on all masonry walls. When through-wall flashings are not incorporated in to the design of the masonry wall, the top of the masonry wall must be protected with water resistant metal or stone coping.

F. Reglet mounted counter flashings are recommended at adjoining walls. Reglets may also be used on parapet walls where through-wall flashings have not been incorporated in to the design of the roof.

G. As an alternate, surface mounted counter flashing may be used in lieu of reglet mounted counter flashing. The contact point of the surface mounted counter flashing shall provide a constant seal and the surface above the counter flashing must be a watertight closure. When surface mounted counter flashing is used, the top of the modified bitumen flashing shall receive a three course application of Soprema Alsan Flashing.

H. A metal or stone coping is required when flashing extends to the wood nailer at the top of a parapet wall or over the top of a parapet. When the flashing does not extend over the top of a parapet wall, and the specified metal termination or counter flashing cannot be installed the same day, the top edge of the base flashing must receive a temporary night seal. All temporary night seal materials must be removed prior to heat welding the flashing cap sheet. As an alternate, Alsan Flashing may be used and left in place as a permanent part of the flashing detail.

I. External insulated finishing systems, stucco, cobblestone, textured masonry, corrugated metal panels, certain types of gypsum boards and other uneven or decorative surfaces are not suitable substrates to receive flashing. Uneven surfaces shall be covered with an overlay of one-half (½”) inch (13 mm) thick exterior grade plywood and a mechanically fastened base sheet. Base sheet fastening shall be done in accordance with “Approved Details” of this specification. Textured surfaces shall be covered with Sopraboard or acceptable Gypsum board. All overlays shall be firmly fastened to underlying structural members and covered with the specified base sheet.

J. The top of all flashing shall be fastened six to eight (6”-8”) inches (152-203 mm) on center with fasteners
Section 2 - General Requirements

 specified in the Approved Details section of this specification.

K. All existing flashing shall be removed prior to the installation of new flashing material.

L. Penetration pockets are not recommended by Soprema. Penetration pockets are considered a maintenance item and are not covered under the terms and conditions of the Soprema Warranty. If penetration pockets must be used, then there must be a minimum of one (1") inch (25 mm) of clearance between penetrations and between penetrations and the sides of the pocket.

M. As an alternate to membrane flashing details, Alsan Flashing may also be used to flash a number of penetration and perimeter details. Refer to "Approved Details" of this specification for more specific information on using Alsan Flashing as a flashing material.

N. The Federal Emergency Management Agency (FEMA) has published a document titled "Rooftop Attachment of Lightning Protection Systems in High-Wind Regions." The FEMA recommendations, as well as the Soprema guidelines for anchoring the recommended cover strips are as follows:

The FEMA guidelines recommend that lightning protection system cables be covered with a nine (9") inch wide strip of modified bitumen membrane. Further, FEMA recommends that the strips be installed in approximately three (3') foot (1 m) sections with a gap of three (3") inches (76 mm) between each section

• Soprema will permit lightning protection systems (LPS) to be installed according to these guidelines with the following conditions and limitations:

  • The three (3') foot (1 m) long and nine (9") inch (229 mm) wide strips must be adhered with Soprema HVMA or HVMA II. Heat welding the cover strips is not recommended.

  • The cover strips may not be installed directly over the length of membrane side laps or end laps. If the lightning protection system cable intersects membrane side laps or end laps, then there must be a minimum of three (3") inches (76 mm) of clearance on each side of the exposed lap.

Following the FEMA guidelines will not have an impact on the UL Certification of the lightning protection system. The anchoring of the LPS in this manner, as well as the standard methods, will not be covered by the Soprema Warranty.

2.28 - Roof Walkways

A. Soprema recommends the installation of an additional layer of membrane or Soprawalk walkways on roofs that will be subjected to regular foot traffic. The extra layer of protection is recommended at all access points and to and from rooftop equipment that is serviced more frequently than monthly.

B. Soprawalk, or an additional layer of membrane, may be heat welded, hot asphalt, or cold process applied. When heat welding, the granules on the cap sheet shall be embedded on the outside three (3") inches (76 mm) of the walkway. Walkways should be no longer than fifteen (15') feet (4.6 m) and shall have a four (4") inch (102 mm) gap between sections to permit drainage.

C. Soprema recommends that the walkways be distinguished by using Soprawalk, or membrane, with different colored granules than the roof. As an alternate, stripes may be painted on the edges of the walkways with a compatible coating.

D. Walkways are considered a maintenance item and walkway attachment is not covered by the Soprema Warranty. The building owner is responsible for walkway maintenance.

E. Walkways with sleepers shall have a sacrificial piece of membrane under each sleeper. The sacrificial piece
Section 2 - General Requirements

Soprema may modify the composition and/or utilization of its product without prior notice. Consequently, orders will be filled according to the latest specifications.

2.29 - Coating Membrane Systems

A. A coating system over a completed roof assembly is not required in order to qualify for a Soprema Warranty.

B. If a roof coating is specified by the Designer of Record, Soprema requires that the coating be R Nova or another coating compatible with modified bitumen membranes. A compatible coating would be a coating manufactured by a Roof Coatings Manufacturer’s Association (RCMA) member manufacturer for application on modified bitumen membranes.

C. RCMA in conjunction with the Asphalt Roofing Manufacturer’s Association (ARMA) have published a brochure entitled ‘Evaluating and Preparing Modified Bitumen Membrane Roofing for Surface Coating Applications.’ This guide provides valuable guidelines on surface preparation of modified bitumen membranes that will be coated.

2.30 - Flood Coat & Gravel Surfacing

A. Granular surfaced Soprema modified bitumen roofing systems do not require a flood coat of asphalt and gravel surfacing in order to qualify for a Soprema Warranty. A flood coat of asphalt and gravel are permitted if specified by the Designer of Record.

B. The asphalt shall be ASTM D 312 Type IV or ASTM D 6152 SEBS Type IV applied at the rate of sixty (60 lbs.) pounds (2.9 kg/m²) per one hundred square feet. The aggregate shall comply with ASTM D 1863. As an alternate, clean slag can be embedded at the rate of three (300 lbs.) hundred pounds (14.6 kg/m²) per one hundred (100) hundred square feet.

C. The aggregate shall comply with ASTM D 1863 and shall be applied at the rate of four (400 lbs.) pounds (19.5 kg/m²) per one hundred square feet. As an alternate, clean slag can be embedded at the rate of three (300 lbs.) hundred pounds (14.6 kg/m²) per one hundred (100) square feet. The aggregate must be dry before it is embedded in to the flood coat. In cold weather, it may be necessary to heat the aggregate prior to application.

D. Other surfacing of similar size, shape, and hardness may be used in lieu of pea gravel or slag. The alternate surfacing shall be opaque, not translucent, in color and resistant to absorbing water.

2.31 - Metal Work

A. All metal flashing surfaces that will receive a direct application of asphalt or bituminous membrane must be primed with Soprema Elastocol 400 or 500 Primer, or other ASTM D 41 asphalt primer, on both sides.

B. All metal flashing shall be supported by wood nailers.

C. Horizontal metal flanges for drip edges or gravel stops shall be a minimum of three and one-half (3 ½”) inches (89 mm) wide and fastened four (4”) inches (102 mm) on center. Overlaps in metal shall be a minimum of three (3”) inches (76 mm) wide, primed with asphalt primer, and receive a layer of Soprema SBS Elastic Cement. All gravel stops or eve strips should be manufactured from an accepted (see “I” below) minimum gauge metal.

D. All factory fabricated shall be installed in accordance with the manufacturer’s instructions.

E. All shop fabricated metal shall be installed in accordance with the Sheet Metal and Air Conditioning Contractors National Association, Inc. (SMACNA) for specifics not addressed in this section or in the Approved Details section of this specification.
Section 2 - General Requirements

F. Metal flashing material, and the fasteners used to fasten the metal, shall be made out of the same metal.

G. The vertical face of metal counter-flashing shall be a minimum of four (4") inches (102 mm) with a minimum one-half (½") inch (13 mm) thirty (30°) degree bend drip edge. The bottom edge of the metal counter-flashing shall cover the top of the membrane flashing a minimum of three (3") inches (76 mm). Metal counter-flashing shall be fastened twelve (12") inches (305 mm) on center, or as frequently as necessary to provide continuous compression, and fasteners shall be watertight. Metal counter flashing assemblies should be a two-piece design with the bottom edge of the metal extending a minimum of three (3") inches (76 mm) beyond the base flashing fasteners.

H. All roof top utilities piping must be set on wood blocking or other acceptable support. The wood blocking or acceptable support must be set on a loose layer of modified bitumen cap sheet or Soprawalk. The sacrificial cushion layer shall be a minimum of two (2") inches (51 mm) larger than the wood blocking, or acceptable support, in all directions.

I. When specification shop formed metal is proposed to be warranted by Soprema, the roofing contractor is responsible to submit either specification metal details or roofing contractor proposed shop drawings to Soprema’s Technical Department for review and possible approval prior to bidding and installation. All other related roofing components must meet, or exceed, Soprema’s standards, SMACNA’s Architectural Sheet Metal Manual Fifth Edition, American National Standard Institute (ANSI) Single Ply Roofing Institute (SPRI) ES 1-98 “Wind Design Standard for Edge Systems Used With Low-slope Roofing Systems”, National Roofing Contractor’s Association Roofing and Waterproofing Manual Fifth Edition requirements or the Florida Building Code - Test Protocol HVHZ Roofing Application Standard (RAS) No. 111, “Standard Requirements for Attachment of Perimeter Wood Blocking and Metal Flashing” requirements or recommendations with the most stringent requirements or recommendations prevailing. In addition, proof of purchase of an acceptable factory applied coating of the flat stock must be submitted upon request. If stainless steel is specified by the Designer of Record, proof of purchase of the flat stock must be submitted upon request.

J. Metal coping must have a minimum face dimension of three (3") inches (76 mm) with a drip edge or hemmed edge on either side. The attachment of the coping system should be to both the inside and outside faces of the wall. Coping end laps shall be made watertight by using a double bead of urethane sealant under a minimum four (4") inch overlap of the coping or a minimum eight (8") wide cover plate.

2.32 - Test Cuts

A. Soprema does not recommend destructive test cut on newly installed roofing systems. Should test cuts be required by the Designer of Record or some other purpose, Soprema recommend ASTM procedures D 2829 and D 3617 for collection of samples. Test cuts shall be taken prior to the application of the final surfacing if one has been specified.

2.33 - Extreme Weather Application

2.33.1 - Cold Weather Application

A. Soprema does not place any restrictions on the application of its modified bitumen roofing systems at temperatures above forty (40°F) degrees Fahrenheit (4.4°C). Roof applications below this temperature require special measures to insure proper application of the roofing system. No hot asphalt application is acceptable without direct heating of the membrane directly during installation, i.e. a torch is used to preheat the roll and the substrate and all the seams are rolled with steel roller. For hot asphalt applied product applications below fifty (50°F) degrees Fahrenheit (10°C), all hot asphalt carriers must be insulated and monitored for the EVT tolerance and all rolls must be hand mopped with he mop not more than three (3’) feet (1 m) from the leading edge of the
membrane.

B. Below fifty (50°F) degrees Fahrenheit (10°C), no application should proceed with cold adhesive. Above fifty (50°F) degrees Fahrenheit (10°C), the membrane rolls need to be unrolled and allowed to flatten for a minimum of one (1) hour. The cold adhesive should be heated with a flameless and thermostatically controllable heat source to a temperature not less than seventy (70°F) degrees Fahrenheit (21.1°C) to provide adequate material temperature to meet estimated coverage rates. Adhesive and deck temperatures relate directly to anticipated coverage rates. Below fifty (50°F) degrees Fahrenheit (10°C) regardless of which method of application is used, all membrane should be stored at fifty (50°F) degrees Fahrenheit (10°C) or higher to speed application time.

C. Application procedures may not begin, or continue, when water is present in any form on the roof deck. Any moisture or condensation that could cause poor adhesion, voids, or entrapment within the system must be removed from the roof deck before work begins or continues.

D. The appropriate asphalt temperature shall be maintained during the installation of Soprema hot asphalt applied roofing systems. Unless asphalt temperatures at the point of application can be maintained at four hundred and twenty-five (425°F) degrees Fahrenheit (219°C), or the asphalt EVT, asphalt and roof membrane application shall be discontinued during cold weather.

E. During some cold weather installations, it may be desirable to cut the membrane into lengths between twelve (12') feet and eighteen (18') feet (3.7 m to 5.5 m).

2.33.2 - Hot Weather Application

A. When roof top temperatures rise above one hundred and ten (110°F) degrees Fahrenheit (43.3°C), the storage of the rolls of membrane should be under a reflective surface with a breathable tarp used for exterior wrapping. On heat welded applications, the base membrane will become sticky. A special work sand is available from Soprema to be spread on top of the excess bleed out to eliminate subsequent cap membrane application problems.

2.33.3 - High Humidity Application

A. During periods of high humidity, combined with late hour or night roofing, the relative humidity will approach dew point during the application. Under these circumstances, all work must cease when the ambient temperature is within five (5°F) degrees Fahrenheit (2.7°C) range of the dew point based on the relative humidity. If these conditions exist, high humidity with night or late hour roofing, the weather conditions should be monitored on a National Weather Service radio station or with weather instruments on the job.

2.34 - Practical Design Considerations

2.34.1 - Climate & Design

A. It is generally held that designers, contractors, and Soprema may be exonerated from these extreme weather problems and consequences due to “acts of God.” However, it is recommended that known local weather extremes be brought to the attention of the owner by incorporating these conditions into the roofing assembly design by the design professional. It is for this reason Soprema has developed a series of climate map guides covering the following areas of hazard: wind, hail, snow, and ice load, heat and cyclic shock. These maps are available upon written request to the Soprema Corporate Technical Department.

2.34.2 - Wind Uplift Forces

A. The standard for evaluation of any warranted project requiring FMG Class 1-60, 1-90, enhanced FMG uplift rating, or ASCE calculation, is for Soprema to receive the completed design review from the design
Soprema may modify the composition and/or utilization of its product without prior notice. Consequently, orders will be filled according to the latest specifications.

Section 2 - General Requirements

professional. The information is to be extracted from FMG publications 1-28, 1-28R/1-29R, 1-29, 1-49, or ASCE 7-02 or the currently used ASCE Document. A large segment of the U.S. population is located in areas which exhibit localized extreme high wind isolachts (refer to the ASCE 50 year Wind Map) and attention must be paid to the exact location of each project when conducting wind force evaluations.

2.34.3 - Damaging Hail

A. FMG, through its Class 1 approval program, has a procedure for testing the effects of dynamic puncture and incorporates this into the assembly approval. While this represents good qualification, it does not take into consideration a vast geographic portion of the U.S. landmass when viewed against the frequency and hail size maps presently available. The exact geographical location should be considered against the FMG hail storm map, Soprema Hail Map or equivalent map. When the site indicates a risk beyond FMG criteria, the design professional should provide the owner with a more hail resistant roofing assembly option. While expressly limited in all warranties, some Soprema systems provide superior long-term protection against hail than do other systems. Contact the Soprema Technical Department for more information.

2.34.4 - Snow & Ice Loads

A. For SBS system construction, the design professional is responsible for evaluating the relative severity of the local snow and ice load. The Soprema criteria uses the ASCE 7-02 or the currently ASCE document ground snow load map. Based on this map, projects may be limited to SBS membrane systems, which feature superior resistance to the forces created by prolonged, excessive snow and ice loads.

2.34.5 - Extreme Temperature Fluctuations

A. It is common knowledge that large scale thermally induced loads which occur at a higher than average frequency will affect the longevity of the roof system. Soprema has mapped the U.S. landmass for this dynamic stress loading produced by weather extremes. Although quantitative data has been used to create this mapping, a direct relationship to specific roofing systems is still not precise. The map is to be used as a general guideline in ascertaining which systems may perform better over the span of time as opposed to others. During the project registration process, some systems may be accepted or rejected at the sole discretion of Soprema due to these factors. Soprema does not recommend the coverboard or top layer of insulation to be mechanically fastened in cold weather climates because of thermal bridging.

2.34.6 - Ponding Water

A. Ponding water is defined as roof areas holding water forty-eight (48) hours after rain when conditions are conducive to drying. As a general guideline, areas larger than three foot (3’ x 3’) by three foot (1 m x 1 m) and a minimum of one-quarter (¼”) inch (6.3 mm) deep, would be in need of remedial work to qualify for the Soprema Warranty. Standing water is defined as water that remains after this forty-eight (48) hour period. “bird baths” are expected and usually predictable.

B. Under the Terms and Conditions of the Soprema Warranty, a Building Owner or the Designer Of Record must recognize that Soprema must either exclude ponding and standing water for a particular project or those areas must be treated under the Soprema ponding and standing water warranty provisions. Further they must recognize that any damage to the roof assembly and membranes due to improper maintenance according to the Soprema Repair and Maintenance Guide, i.e. clogged drains, installation of new curbs or other equipment that is placed directly in an existing waterway and/or severely blocks or stops the original roof drainage design at the time of the Soprema roof installation are excluded from Warranty coverage. Since dirt, algae, mold and other foreign materials can collect in ponded and standing water areas, the cosmetic appearance and apparent health risks associated with such areas of the roof are not the responsibility of Soprema, but rather the Building Owner or his Representative.
C. The Building Owner or Representative, roofing contractor and a Soprema Field Technical Representative will meet on the roof immediately after, within forty-eight (48) hours, a rainstorm. The standing or ponding water areas will be spray-marked along with photo documentation. See currently Soprema Approved Details that depict how the ponding and standing water roof areas must be treated using Soprema liquid membrane coating and granules.

D. When a Soprema cold applied membrane assembly is used on slopes less than one-quarter inch (¼:12) per horizontal foot (2%), or where known ponding and standing water areas are located, Soprema requires the base ply and field cap ply membranes to be installed using hot air welding equipment so as to insure that no ponding water interferes with the cold adhesive curing process at the side and end laps. Note: Soprema requires the Owner to sign Addendum “A” - Ponding Water Agreement form when serious standing or ponding water exists on a soon-to-be warranted project.

2.35 - Project Performance Requirements

A. It is the roofing contractor’s responsibility to confirm that the roof assembly submitted on the Project Registration Form (PRF) complies with the performance requirements of the project specification, i.e. UL Class A, FM Class 1-90, or other building code or agency compliance prior to submission of the PRF to Soprema even if the assembly recommendation is made by Soprema. The Soprema Technical Department is available for consultation to confirm that the system that is specified meets the performance requirements that have been documented in the project specification.

2.36 - Warranties

A. Limited Material Product Replacement Warranty - Soprema offers a limited material only warranty to protect the building owner against leaks that result from product manufacturing defects. The term of the warranty is ten (10) years.

B. Standard No Dollar Limit (NDL) Roof Warranty - Soprema offers a variety of roof warranties covering roof assemblies. The terms of these warranties vary. Some of these warranties cover leaks resulting from defective material or defective installation. The fee associated with these types of warranties is based on the duration of the coverage and the specific components of the assembly included in the warranty coverage. Contact a Soprema sales representative in the region where your project is located for pricing on a project-by-project basis.

C. Exceptions - Tie-ins to other roof assemblies and repairs made to existing roof assemblies will not be warranted by Soprema.

D. Only specific Soprema personnel expressly authorized by Soprema management to modify warranties may make modifications or additions to the standard Soprema warranty documents. Once issued, the warranty document, together with any rider(s) expressly made a part of the warranty document will set forth the entire agreement between the building owner and Soprema with respect to the warranted roof.

2.36.1 Warranty Procedure

A. If the owner of a project is expecting a roof warranty upon completion of roof installation, there are several steps that must first be completed by the roofing contractor and/or the Owner’s design professionals before roof installation begins. The first step is to review the Soprema General Requirements and Approved Details and then apply those guidelines to the deck and insulation, base/anchor sheet, slope-to-drain, and other relevant design considerations present on the project. The next step is to select an appropriate assembly based on the Soprema Method Of Application Selector. Once an appropriate assembly has been identified, a technical review may be requested from the Soprema Technical Department. The qualification for various lengths of warranty coverage available is governed by: the geographical territory (climate factors such as
snow/ice loads, thermal fluctuations, hail, latitude, etc); design factors (potential for substrate movement, insulation, attachment, and deck assembly); slope-to-drain; slope to deck; building use (i.e. retail, offices, freezer, pool); method of application (reroofing); and inherent liability (material only warranty versus a type of roof assembly warranty or special riders (wind, accessories, etc.).

B. Once the design is reviewed, the information must be submitted to Soprema by an authorized Soprema roofing contractor using the Soprema Project Registration Form (PRF). The Soprema Technical Department may review the project information submittal (for warranty eligibility purposes only) and advise of alternate design suggestions (for warranty eligibility purposes only). The materials are then shipped and the local Field Technical Representative is notified, who contacts the Soprema contractor to coordinate the required Technical Services for the specific project.

C. Once the project is substantially completed, a final inspection by a Field Technical Representative or other qualified Soprema employee will need to be performed. A Checklist and Punchlist are issued and items are corrected and confirmed back to Soprema by the roofing contractor. Once written confirmation is received from the roofing contractor that all Punchlist items have been corrected, the Checklist has been signed by the roofing contractor, and all the roofing contractor’s invoices related to the project have been paid, the project is considered successfully completed and Soprema can issue the agreed upon warranty document(s). Whether or not to issue a warranty and the express terms of any warranty issued, however, shall always be subject to the discretion of Soprema.

2.36.2 Warranty Terms

A. Soprema offers a standard material only warranty program for all approved roof assemblies for a term of ten (10) years at no charge. Soprema also offers a variety of roof membrane and/or roof assembly warranties of varying periods of time. Contact your local Soprema sales representative for the current warranty offering and for the schedule of current warranty charges.

B. Soprema also offers a variety of Standard NDL Roof Warranties with the following qualifications. All components under the warranty umbrella must be purchased directly from Soprema or have an accepted purchase deviation notice approved by the Soprema Technical Department. All phases of the application must be available for on-site inspection and an installation review by Soprema Field Technical Service Representatives. All final inspections must take place in the presence of the design professional, the roofing contractor, and the Owner or Owner Representative. Note: Any deviations in the specification design, details or final installation instructions must be acknowledged and witnessed by those in attendance at the final inspection.

C. Soprema reserves the right to agree to any modification of the standard warranty with a warranty rider. Warranty riders are only granted with written permission from the Soprema Technical Department. Riders, generally speaking, must conform to the most recent “rider specimen’s” published by Soprema. These specimens must be executed before the project is bid or approved for shipment and must be referenced on the Project Registration Form. Therefore, if the original warranty approval does not include the terms and provisions requested by the Owner or through the specification process, Soprema has no obligation to include these provisions as riders to its warranty.

D. For Wind Riders, a Preliminary Information Form must be submitted along with the PRF (when applicable) to the Technical Department for review and approval of fastening patterns. Any fastening pattern approval by Soprema is for warranty purposes only. It is the roofing contractor’s and Owner’s responsibility to make sure that the fastening pattern satisfies building code requirements.

F. Only specific Soprema personnel expressly authorized by Soprema management to modify warranties may alter, amend or add to the Soprema Warranty Specimen that is distributed prior to bid. Any different promises
in this regard, whether oral or written, do not bind Soprema.

G. Special warranties can only be authorized by the Soprema Technical Department. Any different promises in this regard, whether oral or written, do not bind Soprema. A specimen of the desired special warranty must be requested by the roofing contractor or Owner/Owner Representative prior to bidding or, if a job is not bid, commencement of work. If the request can be accommodated, the Technical Department will provide the roofing contractor or Owner/Owner Representative with a specimen warranty. As specimen warranty that is not expressly rejected by the roofing contractor or Owner/Owner Representative, in writing, within seventy-two (72) hours after delivery will be deemed accepted by them and will be incorporated into Soprema's warranty document for that project only.

H. Prior to bidding and the project start-up, it is the Soprema Authorized Roofing Contractor's responsibility to obtain and forward to the Soprema Technical Department a written acknowledgment and acceptance of the approved "Warranty Specimen" document from the Owner/Owner Representative(s). Without prior Acknowledgment and Approval, Soprema is neither obligated nor responsible to include any non-approved specification mandated by the Owner/Owner Representative into the standard Soprema Warranty Document(s) after the seventy-two (72) hour process as outlined above occurs or after the project is completed.

I. As between the Soprema and the Owner, Soprema's Warranty Document will supersede and be in lieu of, all other warranties, whether written or oral, expressed or implied, including, without limitation, any merchantability or fitness for a particular purpose.

J. Since Soprema does not practice the professions of architecture or engineering, any review, inspection or approval, expressed or implied, by Soprema or its agents or representatives of the construction or condition of any existing roof, roof deck or building, or the drawings, plans or specifications for a new or replacement roof, is solely for the purpose of determining if Soprema is willing to issue a warranty and does not in any way create a warranty by Soprema of those items and is not a substitute for the professional judgment of an architect, engineer, or a roofing consultant.

End of Section
## Table of Contents

<table>
<thead>
<tr>
<th>Section Titles</th>
<th>Page Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>3.14.5  Heat Welded Attachment Of Spot Attached Modified Bitumen Base Membrane</td>
<td>3-15</td>
</tr>
<tr>
<td>3.14.6  Self-Adhered Attachment Of Spot Attached Modified Bitumen Base Membrane</td>
<td>3-16</td>
</tr>
<tr>
<td>3.15    Polyester Reinforced Modified Bitumen Base Membrane Installation - Soprafix System</td>
<td>3-16</td>
</tr>
<tr>
<td>3.15.1  Mechanical Attachment Of Polyester Reinforced Modified Bitumen Base Membrane</td>
<td>3-17</td>
</tr>
<tr>
<td>3.15.2  Side Lap Welding Techniques For Soprafix</td>
<td>3-18</td>
</tr>
<tr>
<td>3.15.3  Self-Adhered Side Lap &amp; Self-Adhered Cap Membrane For Soprafix</td>
<td>3-19</td>
</tr>
<tr>
<td>3.16    Base Sheet Or Base Membrane Termination</td>
<td>3-19</td>
</tr>
<tr>
<td>3.17    Glass Ply Sheet Installation</td>
<td>3-19</td>
</tr>
<tr>
<td>3.17.1  Hot Asphalt Attachment Of Glass Ply Sheets</td>
<td>3-20</td>
</tr>
<tr>
<td>3.17.2  Cold Adhesive Attachment Of Glass Ply Sheets</td>
<td>3-20</td>
</tr>
<tr>
<td>3.17.3  Two Ply Interply Application Of Glass Ply Sheets</td>
<td>3-20</td>
</tr>
<tr>
<td>3.17.4  Three Ply Interply Application Of Glass Ply Sheets</td>
<td>3-20</td>
</tr>
<tr>
<td>3.17.5  Four Ply Interply Application Of Glass Ply Sheets</td>
<td>3-21</td>
</tr>
<tr>
<td>3.18    Modified Bitumen Ply Membrane Installation</td>
<td>3-21</td>
</tr>
<tr>
<td>3.18.1  Hot Asphalt Attachment Of Modified Bitumen Ply Membrane</td>
<td>3-21</td>
</tr>
<tr>
<td>3.18.2  Heat Welded Attachment Of Modified Bitumen Ply Membrane</td>
<td>3-22</td>
</tr>
<tr>
<td>3.18.3  Cold Process Attachment Of Modified Bitumen Ply Membrane</td>
<td>3-22</td>
</tr>
<tr>
<td>3.19    Modified Bitumen Cap Membrane Installation</td>
<td>3-22</td>
</tr>
<tr>
<td>3.19.1  Hot Asphalt Attachment Of Modified Bitumen Cap Membrane</td>
<td>3-23</td>
</tr>
<tr>
<td>3.19.2  Heat Welded Attachment Of Modified Bitumen Cap Membrane</td>
<td>3-23</td>
</tr>
<tr>
<td>3.19.3  Cold Process Attachment Of Modified Bitumen Cap Membrane</td>
<td>3-23</td>
</tr>
<tr>
<td>3.19.4  Self-Adhered Attachment Of Cap Membrane</td>
<td>3-24</td>
</tr>
<tr>
<td>3.20    Flashing Installation - General Guidelines</td>
<td>3-24</td>
</tr>
<tr>
<td>3.20.1  Flashing Installation Techniques</td>
<td>3-25</td>
</tr>
<tr>
<td>3.20.2  Walls, Curbs, &amp; Expansion Joints With Cant Strips</td>
<td>3-25</td>
</tr>
<tr>
<td>3.20.3  Walls, Curbs, &amp; Expansion Joints Without Cant Strips</td>
<td>3-26</td>
</tr>
<tr>
<td>3.20.4  Cast Iron Roof Drains</td>
<td>3-26</td>
</tr>
<tr>
<td>3.20.5  Roof Edge Metal</td>
<td>3-27</td>
</tr>
<tr>
<td>3.20.6  Inside Corners</td>
<td>3-27</td>
</tr>
<tr>
<td>3.20.7  Outside Corners</td>
<td>3-28</td>
</tr>
<tr>
<td>3.20.8  Pipes With Flashing Sleeves</td>
<td>3-28</td>
</tr>
<tr>
<td>3.20.9  Welded Watertight Scuppers</td>
<td>3-29</td>
</tr>
<tr>
<td>3.20.10 Penetration Pocket</td>
<td>3-29</td>
</tr>
<tr>
<td>3.21    Sheet Metal Installation</td>
<td>3-30</td>
</tr>
<tr>
<td>3.22    Temporary Closures</td>
<td>3-30</td>
</tr>
<tr>
<td>3.23    Cap Sheet Repair</td>
<td>3-31</td>
</tr>
<tr>
<td>3.24    Roof Walkways</td>
<td>3-31</td>
</tr>
<tr>
<td>3.25    Protected Membrane Roof Installation</td>
<td>3-31</td>
</tr>
</tbody>
</table>

Soprema may modify the composition and/or utilization of its product without prior notice. Consequently, orders will be filled according to the latest specifications.
3.00 - General

A. This section of the Soprema Technical Specification Manual shall be used in conjunction with Section 2 - General Requirements, Section 4 - SBS System Selection, and Modified Bitumen Flashing Details as they are applicable to project design and installation.

B. Furnish and install the specified Soprema roofing system in accordance published specification and details as well as the project specification by the Designer of Record. This section of the specification is designed to address procedural and application issues when applying hot asphalt, heat welded, cold process, mechanically fastened, and self-adhered roofing systems.

3.01 - Submittals

A. Submit the completed Soprema Project Registration Form (PRF) a minimum of two weeks prior to beginning installation of the roof. The PRF may be completed on the Sopema web site, www.soprema.us, or filled out manually and faxed to 330-334-7903 as well as the local Sopema sales representative.

B. Submit the completed Preliminary Information Form (PIF), along with the PRF, when a Wind Rider has been specified for the project. A roof plan, project specification, exposure condition photographs (Photos taken from the roof top are required showing North, South, East, and West exposure conditions are required if the project exposure condition is specified on the roof plan or within the specifications), and field fastener pull-out test report (required for re-roof and re-cover projects involving mechanical fasteners) or bonded pull test report (required for re-roof projects involving adhesives).

C. Request a final inspection for warranty when the project is complete. This may be accomplished by faxing the request to customer service at 330-334-6257 or phoning your Technical Service Representative directly.

D. After the final inspection is completed and all of the punchlist items have been repaired, fax the project Checklist and project Punchlist to the Sopema Warranty Department at 330-334-7903.

3.02 - On Site Conditions

A. Work on the project should not begin until the roofing contractor determines that all specifications and details are workable as specified and all project requirements can be achieved.

B. The roofing contractor should not begin work until the roof deck has been prepared as specified and is in acceptable condition to receive the roofing system.

C. By beginning installation of the new roofing system, the roofing contractor has accepted the existing condition as being in conformance with project requirements and applicable building codes.

3.02.1 - Weather

A. Work should not begin when precipitation is forecasted to occur prior to the end of the work day unless the onset of precipitation can be addressed with the appropriate safeguards to prevent damage to the in-process system installation.

B. Roof insulation and roof membrane shall not be installed during inclement weather without additional safeguards. Installation of temporary tie-ins to protect installed permanent materials is acceptable as long as the temporary tie-ins are removed prior to resuming installation of the permanent materials.

C. Do not install roofing materials when moisture is present on the roof deck in any form. Do not install roofing materials if hot asphalt begins to foam.
3.02.2 - Protection
A. Minimize disruption to normal building operations by coordinating roofing operations that involve excessive noise or exposure of the interior of the building with the Building Owner Representative.
B. Temporary tie-ins to protect the finished portions of the roof shall be provided by the roofing contractor at the end of each working shift. When work resumes, all temporary tie-ins shall be entirely removed.
C. Every effort shall be made by the roofing contractor to protect the building occupants, the exterior finish of the building, the building contents, landscaping, and contractor personnel during the duration of the project.
D. When excessive equipment or personnel traffic over a partially completed section of the roof is necessary to complete the project, the contractor shall provide adequate protection for the partially completed section. Plywood set over rigid insulation would constitute adequate protection. Consult the Soprema Technical Department if optional protection methods are being considered.

3.03 - Delivery, Storage, & Handling
A. All roofing materials shall be delivered and stored in their original, unopened containers or packaging bearing the manufacturer’s name, approval organizations, and industry related test standards.
B. When roof insulation is stored outdoors on the job site, it shall be stacked on pallets a minimum of four (4”) inches (102 mm) above ground level and covered with a waterproof tarp. The roof insulation manufacturer’s packaging is not considered waterproof and shall be slit on the narrow ends to avoid condensation inside the packaging.
C. The roofing contractor should consider the effect of loads on the structure and decking due to placement of materials when stocking the roof. All materials should be stored in a neat, safe manner.
D. All roll goods shall be stored on end with the selvage edge up. Double stacking of pallets of Soprema SBS membranes is not recommended.
E. All roofing materials should be stored in a dry, well-ventilated area. Materials should only be removed as needed for daily production.
F. During winter months, store roll goods in above-freezing temperatures. Pails of adhesive and mastics shall be stored between forty (40° F) and eighty (80° F) degrees Fahrenheit (5° to 27° C). Materials that are not used within a four (4) hour period after being brought to the roof should be returned to storage and replaced with warm materials.
G. All materials damaged during transport or storage shall be removed from the job site and replaced. The term damaged can be defined as the material will not perform as specified.

3.04 - Safety
A. Roofing material manufacturers are not qualified to offer advice or direction regarding fire protection protocol during and after roof installation. Information offered in this section would be considered some elementary basics. Soprema suggest that the roofing contractor develop a comprehensive safety training program to address safety issues. Fire prevention is the roofing contractor’s responsibility.
B. Many roofing materials are combustible and should be kept away from ignition sources. Molten asphalt or torch flames may ignite combustible materials.
C. The installation of roof assembly constitutes a risk of burns or other physical injury. Physical contact with molten asphalt should be avoided a minimum of one (1) hour after application.
D. Consult Material Safety Data Sheets (MSDS) and container labels for specific cautions and safety instructions.

E. Follow all local, regional, national, and industry guidelines for fire prevention, detection, and control.

F. Follow industry guidelines for the storage and handling of liquefied petroleum (LP) gas and open flame heat welding tools.

3.04.1 - Training

A. The roofing contractor is responsible for training their workforce in the recommended safety procedures for using kettles, asphalt mopping, propane torches, and general safe roofing practice.

3.05 - Roof Decks - New Construction & Complete Tear-Off

A. The roof deck shall be free of debris, moisture, and projections or depressions and comply with the minimum requirements as outlined in Section 2 - General Requirements.

3.05.1 - Correcting Substrate Defects

A. The roof deck must be thoroughly inspected for defects prior to beginning work. If defects are detected then a list of these defects should be presented to the general contractor for repair. Commence work only after the defects have been corrected. If a general contractor is not involved with the project, then the roofing contractor is responsible for correcting defects in the roof deck before work commences.

3.05.2 - Steel Decks

A. When a Designer of Record is not involved with a re-roofing project, the roofing contractor is responsible for:
   1) removal of surface corrosion on the roof deck and subsequent painting; 2) repair or reinforcement of holes, or severely corroded areas larger than eighteen (18") square inches (0.1 m²); 3) mechanically fastening or welding loose decking; and 4) replacement of decking that has corroded beyond repair or reinforcement. All steel deck repairs should be same gauge and tensile strength as the existing steel decking and be fastened to resist the same withdrawal force as the existing steel decking.

3.05.3 - Concrete Decks

A. An application of Elastocol 400 or 500 Primer, or other ASTM D 41 asphalt primer, is required when hot asphalt is used for the attachment of the insulation, vapor barrier, base sheet, ply sheet(s), or base membrane on a concrete deck. The primer shall be applied at the rate of one hundred to one hundred and fifty (100 to 150 ft²/gal) square feet per gallon (0.41 to 0.61 L/m²) depending on the surface and the porosity of the surface and the solvents permitted to flash-off before work continues.

B. The following NRCA deck dryness test is recommended to verify dryness of the concrete:

   1. Pour one (1) pint (0.5 L) of Type IV bitumen that has been heated to a minimum of four hundred (400° F) degrees Fahrenheit (204° C) on to the concrete deck.

   2. If the bitumen bubbles or foams, then the deck is not dry.

   3. After cooling, attempt to peel the bitumen off the deck. If the bitumen can be removed cleanly, then the deck is not dry.

C. As an alternate to B above, ASTM D 4263 may be performed to determine deck dryness.

D. When a Designer of Record is not involved with a re-roofing project, the roofing contractor is responsible for:
   1) repairs of cracks and deteriorated deck; 2) attachment of loose decking; and 3) replacement of deck that is
deteriorated beyond repair or otherwise unsuitable as a roof substrate.

3.05.4 - Wood Decks
A. When a Designer of Record is not involved with a re-roofing project, the roofing contractor is responsible for:
   1) repair of holes; 2) attachment of loose decking; and 3) replacement of deck that is warped, rotted, or
deteriorated beyond repair or otherwise not suitable as a substrate. All wood deck repairs should be same
thickness as the existing wood decking and be fastened to resist the same withdrawal force as the existing
wood decking.

3.05.5 - Gypsum Decks
A. When a Designer of Record is not involved with a re-roofing project, the roofing contractor is responsible for:
   1) repair of holes or gaps between precast panels; 2) attachment of loose decking; and 3) replacement of
deck that is deteriorated beyond repair or otherwise not suitable as a substrate.

3.05.6 - Lightweight Insulating Concrete Decks (LWIC)
A. When a Designer of Record is not involved with a re-roofing project, the roofing contractor is responsible for
   replacement of deck that is deteriorated beyond repair or otherwise not suitable as a substrate.

3.05.7 - Lightweight Insulating Cellular Concrete Decks (LWICC)
A. When a Designer of Record is not involved with a re-roofing project, the roofing contractor is responsible for
   replacement of deck that is deteriorated beyond repair or otherwise not suitable as a substrate.

3.05.8 - Structural Wood Fiber Decks
A. When a Designer of Record is not involved with a re-roofing project, the roofing contractor is responsible for
   replacement of deck that is deteriorated beyond repair or otherwise not suitable as a substrate. All structural
   wood fiber deck repairs should be same thickness as the existing structural wood fiber decking and be
   fastened to resist the same withdrawal force as the existing structural wood fiber decking.

3.06 - Re-cover Assemblies
A. Re-cover assemblies are defined as installing a new roofing system directly over an existing system. The
   existing roof must provide a suitable surface to receive the new roofing assembly.
B. Any wet insulation shall be removed and replaced with new insulation, and modified bitumen membrane, of
   equal thickness. Blisters shall be cut open, filled with patch material and resealed.
C. The surface of the existing roof must be clean, dry, and free of projections or depressions. The roof deck
   shall comply with the minimum general requirements as outlined in Section 2.
D. All existing flashings must be removed prior to the installation of the new roofing and flashing system.
E. Existing metal, as well as lead flashings, shall be removed and replaced. All metal flashings that come into
   contact with bitumen must be primed with Elastocol 400 or 500 Primer or other ASTM D 41 asphalt primer.

3.06.1 - Smooth Surface Built-Up Roofs
A. Refer to Section 2.11 for additional information concerning existing smooth surface built-up roofs that have,
or have not, been resaturated or coated.
B. The first layer of the re-cover assembly shall be mechanically fastened with acceptable fasteners. The first
   layer may be Sopra-G, Modified Sopra-G, Elastophene, Sopralene, or Sopraboard. Contact the Soprema
Technical Department for acceptability if other options are being considered.

C. The existing smooth surface built-up roof must first be primed with Elastocol 400 or 500 Primer, or other ASTM D 41 asphalt primer, if hot asphalt is used for the attachment of the base sheet or re-cover board. The primer shall be applied at the rate recommended by the manufacturer.

3.06.2 - Mineral Surface Built-Up Or Modified Bitumen Roofs

A. Refer to Section 2.11 for additional information concerning direct application to mineral surfaced built-up or modified bitumen roofs.

B. The first layer of the re-cover assembly shall be mechanically fastened with acceptable fasteners. The first layer may be Sopra-G, Modified Sopra-G, Soprase, Sopra 4897, Elastophene, Sopralene, or Sopraboard. Contact the Soprema Technical Department for acceptability if other options are being considered.

C. The existing smooth surface built-up roof must first be primed with Elastocol 400 or 500 Primer, or other ASTM D 41 asphalt primer, if hot asphalt is used for the attachment of the base sheet or re-cover board. The primer shall be applied at the rate recommended by the manufacturer.

3.06.3 - Coal Tar Pitch &/Or Gravel Surface Built-Up Or Modified Bitumen Roofs

A. Refer to Section 2.11 for additional requirements.

B. A mechanically fastened re-cover board is required over an existing gravel surfaced roof, where the gravel will remain, or the existing roof is coal tar pitch. Except for gravel used to level depressions, all loose gravel must be removed.

C. Caution: Fastener penetration of an existing coal tar pitch roof and deck may cause a flow of coal tar pitch into the building.

D. Soprema SBS modified bitumen membranes may not be installed directly over concrete decks where a coal tar pitch has been removed and residual amounts of coal tar pitch remain. Contact the Soprema Technical Department for more information.

3.06.4 - Sprayed-In-Place Urethane Roofs

A. Sprayed-in-place urethane roofs are not acceptable substrates for Soprema roofing systems and must be removed down to the deck prior to the installation of the new Soprema roofing system.

3.07 - Vapor Retarder Installation

A. The vapor retarder must be properly sealed at all laps, joints, and penetrations. Penetrations must be flashed or enveloped.

B. All punctures in the vapor retarder must be repaired prior to installing the roof insulation.

C. The surfaces to be combined must be smooth, dry, and free from dirt, dust, grease, oil, or other contaminants.

D. Insulation boards should be installed immediately over the vapor retarder to avoid damage to the vapor retarder during construction of the roof.

E. Vapor retarders are only effective in reducing transmission of moisture vapor when properly installed and are not damaged or punctured during installation.
Section 3 - SBS Application

3.07.1 - Vapor Retarder Installation Over Steel Deck

A. The vapor retarder may be installed directly over the steel deck or between two layers of insulation.

1. Vapor retarder installation directly to a steel deck:
   a. Beginning at the low point of the roof, chalk a line on the steel deck for alignment of sheets of vapor retarder.
   b. Attach the vapor retarder in accordance with the manufacturer’s instructions.
   c. Apply successive plies in shingle fashion and overlap previous layer side laps two (2") inches to four (4") inches (51 to 102 mm) depending on the configuration of the steel deck. Stagger adjacent end laps a minimum of eighteen (18") inches (457 mm).
   d. Attach the insulation in accordance with the project specification.

2. Vapor retarder installation between two layers of insulation:
   a. The base layer shall be a nominal thickness of thermal barrier material and shall be mechanically fastened.
   b. Beginning at the low point of the roof, chalk a line on the thermal barrier for alignment of sheets of vapor retarder.
   c. Attach the vapor retarder in accordance with the manufacturer’s instructions.
   d. Apply successive plies in shingle fashion and overlap previous layer side laps two (2") inches to four (4") inches (51 to 102 mm) depending on the configuration of the steel deck. Stagger adjacent end laps a minimum of eighteen (18") inches (457 mm).
   e. Attach the insulation in accordance with the project specification.

3.07.2 - Vapor Retarder Installation Over Concrete Decks

A. Prime the concrete deck with Elastocol 400 or 500 Primer, or other ASTM D 41 asphalt primer, at the rate of one hundred of one hundred and fifty (100 to 150 ft²/gal) per gallon (0.41 to 0.61 L/m²) and permit the solvents to flash-off prior to the application of the roofing system.

B. Do not apply asphalt primer within four (4") inches (102 mm) of precast concrete panel joints, cracks, or roof openings.

C. Over concrete panel joints, install a minimum six (6") inch (152 mm) wide strip of a sanded bottom modified bitumen base membrane centered over the joint and spot attach to the concrete deck on one side with hot asphalt.

D. Starting at the low point of the roof, chalk a line on the primed concrete deck for alignment of the first sheet of vapor retarder.

E. Attach the vapor retarder in accordance with the manufacturer’s instructions. The typical hot asphalt attachment for vapor retarders is thirteen (13 lbs.) pounds per one hundred (100) square feet (.68 kg/m²) in continuous ribbons two to three (2" to 3") inches (51 to 76 mm) wide at not more than six (6") inches (152 mm) on center parallel to the concrete joints.

F. Apply successive plies in shingle fashion and overlap previous layer side laps two (2") inches to four (4") inches (51 to 102 mm) depending on the configuration of the steel deck. Stagger adjacent end laps a minimum of eighteen (18") inches (457 mm).
G. Hot asphalt attach the insulation at the rate of twenty-five (25 lbs.) pounds per one hundred (100) square feet (1.2 kg/m²) or in accordance with the project specification. Note: Some cold adhesives may be used in lieu of hot asphalt. Contact the Soprema Technical Department for additional information.

3.07.3 - Vapor Retarder Installation Over Wood & Structural Wood Fiber Decks
A. Mechanically fasten one ply of Soprema Sopra G base sheet, or other acceptable base sheet, using the appropriate number and type of fasteners. The number and type of fasteners, as well as the fastening pattern, will be based on published values for new construction and the fastener withdrawal values conducted on the roof deck for re-roof.
B. Starting at the low point of the roof, chalk a line on the deck for alignment of the first sheet of vapor retarder.
C. Attach the vapor retarder in accordance with the manufacturer’s instructions. The typical hot asphalt attachment for vapor retarders is thirteen (13 lbs.) pounds per one hundred (100) square feet (.68 kg/m²) in continuous ribbons two to three (2" to 3") inches (51 to 76 mm) wide at not more than six (6") inches (152 mm) on center parallel to the concrete joints. If the vapor retarder will become an integral part of the finished roof system and additional components of the assembly will be hot asphalt attached to the vapor retarder without additional fastening into the deck, then the interply rate of twenty-five (25 lbs.) pounds per one hundred (100) square feet (1.2 kg/m²) shall be used.
D. Apply successive plies in shingle fashion and overlap previous layer side laps two (2") inches to four (4") inches (51 to 102 mm) depending on the configuration of the steel deck. Stagger adjacent end laps a minimum of eighteen (18") inches (457 mm).
E. Hot asphalt attach the insulation at the rate of twenty-five (25 lbs.) pounds per one hundred (100) square feet (1.2 kg/m²) or in accordance with the project specification.

3.08 - Asphalt Installation
A. Soprema roofing systems require the use of ASTM D 312, Type IV asphalt for the application of roof insulation, base sheets, base membranes, ply sheets, ply membranes, and cap membranes on all applicable slopes.
B. During installation with hot asphalt, proper bitumen weight must be maintained. Use equipment and installation techniques recognized by the roofing as being sound installation procedures.

3.08.1 - Asphalt Grades For Application Of Roofing Systems
A. ASTM D 312, Type III or IV asphalt, or ASTM D 6152 asphalt, can be used for insulation, base sheets, base membranes, ply sheets, ply membranes, and cap membranes mopping on slopes up to and including three (3") inches per foot (25%).
B. ASTM D 312, Type III asphalt has a softening point between one hundred and ninety-four and two hundred and twenty-five (194° to 205° F) degrees Fahrenheit (90° to 96° C) and is applied between four hundred and twenty-five (425° F) degrees and four hundred and seventy-five (475° F) degrees Fahrenheit (219° to 246° C). The maximum heating temperature is five hundred (500° F) degrees Fahrenheit (260° C).
C. ASTM D 312, Type IV asphalt has a softening point between two hundred and ten and two hundred and twenty-five (210° to 225° F) degrees Fahrenheit (99° to 107° C) and is applied between four hundred and twenty-five (425° F) degrees and four hundred and seventy-five (475° F) degrees Fahrenheit (219° to 246° C). The maximum heating temperature is five hundred (500° F) degrees Fahrenheit (260° C).
D. ASTM D 6152 asphalt has a softening point between one hundred and eighty-five and two hundred and forty (185° to 240° F) degrees Fahrenheit (85° to 116° C) and is applied between four hundred and forty (440° F) degrees and four hundred and ninety (490° F) degrees Fahrenheit (225° to 255° C). The maximum heating temperature is five hundred (500° F) degrees Fahrenheit (260° C).

3.08.2 - Asphalt Application

A. The asphalt application rate for all base, interply, and cap sheets and membranes is twenty-five pounds per one hundred (25 lbs/100 ft²) square feet (1.2 kg/m²) plus or minus twenty (20%) percent.

B. The asphalt temperature at the point of application shall be the EVT plus or minus twenty-five (25° F) degrees (13° C). A viscosity of one hundred and twenty-five (125) centipoise is required for hand mopping and seventy-five (75) centipoise for mechanical spreaders.

C. For ASTM D 312 Type III or IV asphalt, the asphalt temperature at the point of application shall not be less than four hundred and twenty-five (425° F) degrees Fahrenheit (219° C) at the point of application.

D. For ASTM D 6152 asphalt, the asphalt temperature at the point of application shall not be less than four hundred and fifty-five (455° F) degrees Fahrenheit (235° C) at the point of application.

E. Kettle and tanker thermometers should be checked periodically to ensure accuracy and proper asphalt heating temperatures.

F. Do not heat asphalt beyond the flash point or the finished blowing temperature for more than four (4) hours.

G. Over nights, holidays, and weekends, do not maintain asphalt temperature heated above three hundred and twenty-five (325° F) degrees Fahrenheit (163° C) in heated tankers.

H. The kettle operator shall be fully trained regarding safe operation of the kettle and have the required clothing, personal protective equipment, and fire protection equipment.

I. Do not mix different types of asphalt in the same kettle. Do not mix coal tar pitch with asphalt in the same kettle.

3.09 - Wood Nailer Installation

A. Wood nailers shall be installed as specified by the Designer of Record or as required in these specifications and details.

B. Wood Nailers shall be attached to the deck, or other building member, to resist a force of two hundred (200 lbs.) pounds (91 kg) per lineal foot (305 mm) in all directions.

C. The height of the wood nailers shall match the total thickness of the specified insulation and shall be installed with a one-eighth (⅛”) inch (3.2 mm) gap between each length and each change of direction.

3.10 - Insulation Installation

A. Only install as much insulation as can be covered with finished roof the same day.

B. It is unacceptable to install wet, damaged, warped, or defective insulation.

C. Install insulation boards with joints staggered. With multiple layers of insulation, stagger joints between layers.

D. Install insulation boards so that the dimension that is parallel to flute direction on a metal is supported by the top of the flute. Do not kick insulation boards into place.
E. Fit insulation tightly around all penetrations and nailers. Gaps between insulation boards, or penetrations, that exceed one-quarter (¼”) inch (6.4 mm) must be filled with similar insulation material.

F. To create a sump for drainage, tapered insulation is recommended around all drains. Mitering the insulation is required at drain sump joints.

G. Insulation boards used to create saddles or crickets shall be mitered and filled at ridges so that there are no open joints.

H. For mechanically anchored systems, insulation boards must be presecured to the roof deck with acceptable fasteners and plates and in accordance with the project specifications.

I. For adhered systems, insulation boards must be firmly attached to the roof deck or base sheet with fasteners and plates, hot asphalt, or accepted adhesive. Three (3”) inch diameter plates must be used in conjunction with acceptable fasteners when mechanically fastening insulation.

J. Install saddle or cricket systems in accordance with the insulation manufacturer’s instructions and the project specifications.

K. Heat welded roofing membranes may not be applied directly over plastic fastening plates.

L. When hot asphalt is applied directly over a coverboard that is directly over polystyrene, then all joints of the coverboard shall be taped or sealed.

M. When a membrane is cold adhesive applied directly over a coverboard that is directly over polystyrene, the system must be accepted, in writing, by the Soprema Technical Department. Additional design considerations are required in order for the system to be accepted by Soprema.

3.11 - Insulation Fastening

A. Refer to Section 2.14 for information concerning fastener withdrawal resistance requirements and section 2.20.3 for fastener penetration requirements.

B. Fasteners shall be installed vertically to ensure proper engagement into the deck.

C. Fasteners that are over-driven to the point where the fastening plate cups or buckles, the insulation plate must be removed and replaced.

D. Fasteners must be driven so that the fastener head is snug to the fastening plate.

E. Three (3”) inch (76 mm) diameter metal or plastic fastening plates are required when mechanically fastening insulation, or both insulation and a base sheet with a common fastener. Plastic plates may not be used with heat welded systems.

3.12 - Cant Strip Installation

A. Install cant strips as specified by the Designer Of Record.

B. Cant strips may be made of treated wood, perlite, fiberglass, concrete, or lightweight concrete.

C. Cant strips may be mechanically fastened, set in hot asphalt, or set in cold adhesive.

D. Cant strips shall be mitered at inside and outside corners and fitted neatly at joints.

3.13 - Asphalt Coated Glass or Polyester Base Sheet Installation

A. Install the coated base sheet using the application method specified by the Designer Of Record or as
required by these specifications and details.

B. Coated base sheet side laps shall be three or four (3” or 4”) inches (76 or 102 mm) wide depending on the system design.

C. All coated base sheet end laps shall be six (6”) inches (152 mm) wide.

D. Coated base sheet side laps and end laps shall be staggered a minimum of twelve (12”) inches (305 mm) from the side laps and end laps of successive plies. The practice of belly-banding is prohibited for all warranted projects.

E. Begin installation at the low point of the roof. Use a chalk line where necessary to insure proper alignment. Unroll and align base sheet prior to attachment.

F. If two plies of coated base sheet are required, then use a half width as the starter ply.

G. Voids, fishmouths, and any other defect that would cause buckles, blisters, or stress in the finished system must be removed and patched.

3.13.1 - Hot Asphalt Attachment Of Coated Base Sheet

A. Install the coated base sheet in hot asphalt applied at the rate of twenty-five (25 lbs.) pounds per one (100) hundred square feet (½ kg/m²).

B. The coated base sheet side laps and end laps shall be fully adhered with asphalt.

C. The coated base sheet must lay flat and be fully and uniformly bonded to the substrate. The coated base sheet must be broomed to insure embedment.

D. The coated base sheet must extend far enough to accommodate the flashing requirements as specified by the Designer Of Record or as illustrated in the detail section of this specification.

E. Foot and machine traffic shall be kept to a minimum on freshly applied components of the system to reduce the possibility of asphalt displacement from point loading.

F. Discontinue asphalt application over any substrate where the asphalt foams.

3.13.2 - Mechanical Attachment Of Coated Base Sheet With Screws & Plates

A. Unroll the coated base sheet and allow it to relax. As uniform tension is being applied to the coated base sheet, begin fastening at the center of the sheet and work to the end laps pushing all wrinkles and buckles ahead as work progresses.

B. The coated base sheet may be fastened with acceptable fasteners and three (3”) inch diameter (76 mm) plates. The fastening pattern shall be determined by the Designer Of Record or the Soprema Technical Department, based on the fastener withdrawal values achieved on existing roof decks, published withdrawal values by fastener manufacturers for new construction, and the required wind uplift resistance of the roofing system.

C. Refer to the Approved Details section of this specification for coated base sheet fastening densities and patterns.

3.13.3 - Mechanical Attachment Of Coated Base Sheet With LWIC & LWICC Fasteners

A. Unroll the coated base sheet and allow it to relax. As uniform tension is being applied to the coated base sheet, begin fastening at the center of the sheet and work to the end laps pushing all wrinkles and buckles
ahead as work progresses.

B. The coated base sheet may be fastened with acceptable fasteners and acceptable LWIC and LWICC fasteners and plates. The fastening pattern shall be determined by the Designer Of Record or the Soprema Technical Department, based on the fastener withdrawal values achieved on existing roof decks, published withdrawal values by fastener manufacturers for new construction, and the required wind uplift resistance of the roofing system.

C. As an alternate, a venting base sheet may be used in lieu of a coated base sheet. The venting base sheet shall meet ASTM D 4897 material standards.

D. Refer to the Approved Details section of this specification for coated base sheet fastening densities and patterns.

3.13.4 - Mechanical Attachment Of Coated Base Sheet With Cap Nails

A. Unroll the coated base sheet and allow it to relax. As uniform tension is being applied to the coated base sheet, begin fastening at the center of the sheet and work to the end laps pushing all wrinkles and buckles ahead as work progresses.

B. Over wood decks, the Designer Of Record may require a layer of red rosin paper between the coated base sheet and the roof deck. In these applications, the layer of red rosin is loose laid under the coated base sheet.

C. The coated base sheet is fastened with one (1") inch (25 mm) diameter metal head cap nails with a ring or spiral shank. The fastening pattern shall be determined by the Designer Of Record or the Soprema Technical Department, based on the fastener withdrawal values achieved on existing roof decks, published withdrawal values by fastener manufacturers for new construction, and the required wind uplift resistance of the roofing system.

D. Refer to the Approved Details section of this specification for coated base sheet fastening densities and patterns.

3.13.5 - Cold Process Attachment Of Coated Base Sheet

A. Soprema FM Adhesive Squeegee Grade, FM Adhesive (VOC) Squeegee Grade, FM Adhesive (VOC-1) Squeegee Grade or High Velocity Membrane Adhesive (HVMA) may be used to cold process adhere a coated base sheet. None of these products may be used for vertical applications. Use trowel grade blends of each of these adhesives for vertical or flashing applications.

B. HVMA, FM Adhesive (VOC) Squeegee Grade, and FM Adhesive (VOC-1) Squeegee Grade are squeegee or trowel applied only. FM Adhesive Squeegee Grade may either be squeegee, trowel, or spray applied with specific spray equipment.

C. All HVMA seams are either hot air welded or heat welded using a propane torch.

D. Squeegee, trowel, or spray apply the specified cold adhesive to the coverboard at the rate of one and one-half to two gallons (1½ - 2 gal/100ft²) per one hundred square feet (0.61 - 1.63 L/m²). For porous surfaces, apply the specified adhesive to the coverboard at the rate of two to two and one-half gallons (2 - 2 ½ gal/100ft²) per one hundred square feet (1.63 - 3.26 L/m²).

E. Apply the adhesive in an area slightly larger than the width of the sheet. Allow five (5) to fifteen (15) minutes for “flash-off” time before embedding the coated base sheet. Flash-off time will vary depending on sunlight available, humidity, wind, and ambient temperature.
F. At the three (3") inch (76 mm) wide side laps and six (6") inch (152 mm) wide end laps, the adhesive shall be installed so that a one-quarter (¼") inch (6.4 mm) bead of adhesive is visible.

3.14 - Polyester Or Glass Reinforced Modified Bitumen Base Membrane Installation

A. Install the polyester or glass reinforced modified bitumen base membrane using the application method specified by the Designer Of Record or as required by these specifications and details.

B. Base membrane side laps shall be three (3") inches (76 mm) wide.

C. All base membrane end laps shall be six (6") inches (152 mm) wide.

D. Polyester or glass reinforced modified bitumen base membrane side laps and end laps shall be staggered a minimum of twelve (12") inches (305 mm) from the side laps and end laps of successive plies. The practice of belly-banding is prohibited for all warrantied projects.

E. For a two (2) ply system, begin with a half sheet by cutting the base membrane in half lengthwise on the first course of membrane installed.

F. For a three (3) ply system, begin with a one-third sheet by cutting the base membrane into thirds on the first course of membrane installed.

G. Begin installation at the low point of the roof. Use a chalk line where necessary to insure proper alignment. Unroll and align polyester or glass reinforced modified bitumen base membrane prior to attachment.

H. Voids, fishmouths, and any other defect that would cause buckles, blisters, or stress in the finished system must be removed and patched.

3.14.1 - Hot Asphalt Attachment Of Modified Bitumen Base Membrane

A. Install the polyester or glass reinforced modified bitumen base membrane in hot asphalt applied at the rate of twenty-five (25 lbs.) pounds per one (100) hundred square feet (½ kg/m²).

B. The polyester or glass reinforced modified bitumen base membrane laps and end laps shall be fully adhered with asphalt.

C. The polyester or glass reinforced modified bitumen base membrane must lay flat and be fully and uniformly bonded to the substrate.

D. The polyester or glass reinforced modified bitumen base membrane must extend far enough to accommodate the flashing requirements as specified by the Designer Of Record or as illustrated in the detail section of this specification.

E. Foot and machine traffic shall be kept to a minimum on freshly applied components of the system to reduce the possibility of asphalt displacement from point loading.

F. Discontinue asphalt application over any substrate where the asphalt foams.

3.14.2 - Heat Welded Attachment Of Modified Bitumen Base Membrane

A. Beginning at the low point of the roof, unroll one-half of the first roll for positioning, and re-roll.

B. Soprema recommends that the heat welding operator be positioned in front of the roll and use a metal pole with a hook configuration to pull the roll towards installation as opposed to being positioned behind the roll being installed and pushing the roll.
C. Beginning at the re-rolled portion of the base membrane, apply the heat evenly across the bottom of the roll and along the exposed side lap of the previously installed roll.

D. Apply enough heat to melt the film on the bottom of the modified bitumen base membrane and the lap on the previously installed sheet. The modified bitumen base membrane has softened enough to roll into place when a small bead of bitumen can be seen in front of the roll and at the side lap.

E. Re-roll the unadhered portion of the modified bitumen base membrane and repeat the above method to complete installation of the roll.

F. Foot and machine traffic shall be kept to a minimum on freshly applied components of the system to reduce the possibility of asphalt displacement from point loading.

3.14.3 - Cold Process Attachment Of Modified Bitumen Base Membrane

A. Soprema FM Adhesive Squeegee Grade, FM Adhesive (VOC) Squeegee Grade, FM Adhesive (VOC-1) Squeegee Grade or HVMA may be used to cold process adhere a modified bitumen base membrane. None of these products may be used for vertical applications. Use trowel grade blends of each of these adhesives for vertical or flashing applications.

B. HVMA, FM Adhesive (VOC) Squeegee Grade, and FM Adhesive (VOC-1) Squeegee Grade are squeegee or trowel applied only. FM Adhesive Squeegee Grade may either be squeegee, trowel, or spray applied with specific spray equipment.

C. All HVMA seams are either hot air welded or heat welded using a propane torch.

D. Squeegee, trowel, or spray apply the specified cold adhesive to the coverboard at the rate of one and one-half to two gallons (1½ - 2 gal/100ft²) per one hundred square feet (0.61 - 1.63 L/m²). For porous surfaces, apply the specified adhesive to the coverboard at the rate of two to two and one-half gallons (2 - 2 ½ gal/100ft²) per one hundred square feet (1.63 - 3.26 L/m²).

E. Apply the adhesive in an area slightly larger than the width of the sheet. Allow five (5) to fifteen (15) minutes for “flash-off” time before embedding the polyester or glass reinforced base sheet. Flash-off time will vary depending on sunlight available, humidity, wind, and ambient temperature.

F. At the three (3”) inch (76 mm) wide side laps and six (6”) inch (152 mm) wide end laps, the adhesive shall be installed so that a one-quarter (¼”) inch (6.4 mm) bead of adhesive is visible.

3.14.4 - Self-Adhered Attachment Of Modified Bitumen Base Membrane

A. Unroll, position, and align the length of self-adhered base membrane at the lowest point of the roof with the release poly covered selvage edge on the up-slope side.

B. If beginning at a drain, it will be necessary to prepare the side lap area on the opposite side of the factory prepared lap area. For self-adhered membranes with plastic burn-off film on the top surface, the lap must be hot air welded in order to melt the film as successive sheets are installed. For self-adhered membranes with sand on the top surface, the sanded area must be primed with Elastocol 400 or 500, or other ASTM D 41 asphalt primer, prior to sealing the lap. End laps and “T” joints are sealed using hot air welding techniques or where applicable, heat welding, or flashing trowel grade cold adhesive.

C. The following applies to all but Lastobond products. After the membrane is placed in its final position, re-roll so that one-half of the sheet is rolled up. Using a straight blade utility knife, carefully score the release poly across the width of the roll.
D. Roll the self-adhered base membrane in to its final position as the release poly is being removed. Re-roll the remaining section of the self-adhered base membrane and repeat the process.

E. Align successive sheets with three (3") inch (76 mm) wide side laps and six (6") inch (152 mm) wide end laps.

3.14.5 - Heat Welded Attachment Of Spot Attached Modified Bitumen Base Membrane

A. The following applies to the installation of all Soprema Colvent TG base membranes over LWIC or LWICC.

B. Prime the surface of the substrate with Soprema Elastocol 400 or 500 Primer at the rate of one hundred to one hundred and fifty (100 to 150 ft²/gal) square feet per gallon (0.41 to 0.61 L/m²) no less than forty-eight (48) hours after the pour and no more than seventy-two (72) hours after the pour. If rain is imminent on day three (3) after the pour then the primer must be applied on day two (2) after the pour.

C. Just prior to the application of the Colvent TG, re-prime the surface with an application of Elastocol 400 or 500 at the same rate as the first application of primer. Allow the primer to flash-off before heat welding.

D. Heat weld the adhesive strips directly to the substrate using the same technique, and amount of heat, as a fully welded SBS base membrane.

E. It is critical that the Colvent TG base membrane not be totally heat welded to the substrate on the end laps when work is over for the shift or day. If this technique is used as a nightly tie-off then the fully welded end lap area must be removed before work resumes. The channels between the heat welded strips must continue from one base membrane to the next in order for the “venting” function of the Colvent to perform as designed.

F. Colvent TG end laps shall be six (6") inches (152mm).

G. If Colvent TG is used for flashing on parapet walls then the Colvent TG must be installed so that the venting channels are perpendicular to the plane of the roof.

3.14.6 - Self-Adhered Attachment Of Spot Attached Modified Bitumen Base Membrane

A. The following applies to the installation of all Soprema Colvent SA base membranes over LWIC or LWICC.

B. Prime the surface of the substrate with Soprema Elastocol 600c Primer at the rate of one hundred to one hundred and fifty (100 to 150 ft²/gal) square feet per gallon (0.41 to 0.61 L/m²) no less than forty-eight (48) hours after the pour and no more than seventy-two (72) hours after the pour. If rain is imminent on day three (3) after the pour then the primer must be applied on day two (2) after the pour.

C. Just prior to the application of the Colvent SA, re-prime the surface with an application of Elastocol 600c at the same rate as the first application of primer. Allow the primer to flash-off.

D. Install the Colvent SA base membrane into the primed surface. Roll the Colvent SA with a steel roller to ensure adhesive contact between the adhesive strips and the primed surface.

E. It is critical that the Colvent SA base membrane not be totally sealed to the substrate on the end laps when work is over for the shift or day. If this technique is used as a nightly tie-off then the fully adhered end lap area must be removed before work resumes. The channels between the self-adhered strips must continue from one base membrane to the next in order for the “venting” function of the Colvent to perform as designed.

F. Colvent SA end laps shall be six (6") inches (152mm).

G. If Colvent SA is used for flashing on parapet walls then the Colvent SA must be installed so that the venting channels are perpendicular to the plane of the roof. The height limit for self-adhered base membranes is two (2’) feet (610 mm).
3.15 - Polyester Reinforced Modified Bitumen Base Membrane Installation - Soprafix System

A. Install the polyester reinforced modified bitumen base membrane using the fastening rate specified by the Designer Of Record or as required by these specifications and details.

B. Base membrane side laps shall be four, five, or six (4” or 5” or 6”) inches (102 or 127 or 152 mm) wide.

C. All base membrane end laps shall be six (6”) inches (152 mm) wide.

D. Polyester reinforced modified bitumen base membrane side laps and end laps shall be staggered a minimum of twelve (12”) inches (305 mm) from the side laps and end laps of successive plies or cap membrane. The practice of belly-banding is prohibited for all warranted projects.

E. Begin installation at the low point of the roof. Use a chalk line where necessary to insure proper alignment. Unroll and align polyester reinforced modified bitumen base sheet prior to attachment.

F. Voids, fishmouths, and any other defect that would cause buckles, blisters, or stress in the finished system must be removed and patched.

3.15.1 - Mechanical Attachment Of Polyester Reinforced Modified Bitumen Base Membranes

A. Soprafix has a sanded underside surface and a high brush sanded topside surface. The properly cleaned and dry top surface allows for inner ply or cap membranes to be bonded either by hot mopping, FM Adhesive, heat welding, or Colphene self-adhered application methods. Primer is required with a self-adhesive inner ply or cap membrane. Soprafix features a five (5”) inch (127 mm) wide side lap covered with plastic burn-off film for heat or hot air welding. When either heat or hot air welding is used, a weighted roller is applied to the seam area to insure watertight integrity. Soprema SBS Mastic is applied to all side and end lap edges of Soprafix when self-adhesive inner ply membrane or cap membrane is installed. In designs that utilize a Soprafix Batten Bar, the side lap width may be reduced to four (4”) inches (102 mm).

B. Soprafix (S) has a plastic burn-off film on the top and underside. A ply or cap membrane with an underside burn-off film is heat welded to the Soprafix (S) membrane top surface. Soprafix (S) features a four (4”) inch (102 mm) side lap with burn-off film. When either heat or hot air welding is used, a weighted roller is applied to the seam area to insure watertight integrity. End laps and “T” joints are sealed using either heat welding or hot air welding techniques.

C. Soprafix-e and Soprafix-e FR have a sanded underside surface and a high brush sanded topside surface. The properly clean and dry top surface allows for inner ply or cap membranes to be bonded either by hot mopping, FM Adhesive, heat welding, or Colphene self-adhered application methods. Primer is required with a self-adhesive inner ply or cap membrane. Soprafix-e and Soprafix-e FR features a five (5”) inch (127 mm) wide self-adhesive side lap that are covered with release film. No side lap lay lines are added since the sanded top surface delineates where the five (5”) inch (127 mm) wide areas begin. Vigorous hand or motorized roller pressure are applied to the self-adhesive seam areas to insure watertight integrity. End laps and “T” joints are sealed using either heat welding or hot air welding techniques. Soprema SBS Mastic is applied to all side and end lap edges of Soprafix-e and Soprafix-e FR when self-adhesive inner ply or cap membrane is installed. In designs that utilize a Soprafix Batten Bar, the side lap width may be reduced to four (4”) inches (102 mm).

D. Soprafix (X) has a plastic burn-off film on the top and underside. A ply or cap membrane with an underside burn-off film is heat welded to the Soprafix (X) membrane top surface. Soprafix (X) features a six (6”) inch (152 mm) side lap with burn-off film. When either heat or hot air welding is used, a weighted roller is applied to the seam area to insure watertight integrity. End laps and “T” joints are sealed using either heat welding or hot air welding techniques.
E. Soprafix (F) has a plastic burn-off film on the top and underside. A ply or cap membrane with an underside burn-off film is heat welded to the Soprafix (F) membrane top surface. Soprafix (F) features a five (5") inch (127 mm) side lap with burn-off film. When either heat or hot air welding is used, a weighted roller is applied to the seam area to insure watertight integrity. End laps and "T" joints are sealed using either heat welding or hot air welding techniques. The Soprafix (F) base membrane is used primarily with the Soprema Tri-Fix fastening system.

F. Unless otherwise noted in the Soprafix Approved Details, the installer must center the required Soprafix Stress Plate, Soprafix Metal Batten Bar, or Soprafix Polymer Batten Bar down the longitudinal middle of the side lap seam. The Soprafix Stress Plate or Soprafix Batten Bar are fastened with #14 or #15 Soprema fasteners in accordance with the Soprafix Approved Details or as required to meet specific wind uplift requirements. Fastening is required in the six (6") inch (152 mm) wide end laps in the perimeter and corners of the roof. The end lap fastening in the perimeter and corners shall be the same spacing as in the side lap fastening in the perimeter and corners. Fastening is not required in the six (6") inch (152 mm) wide end laps in the field of the roof.

G. The standard spacing of side lap fasteners in the field of the roof is eighteen (18") inches (457 mm) on center. Fastener spacing may be adjusted in order to comply with wind uplift requirements of the project. Additional fastening is required on the perimeters and in the corners of the roof. Refer to the Approved Details section of this specification for fastening rates and patterns.

H. One or more additional rows of fasteners and Stress Plates or Batten Bar may be required in the field, perimeter, and corners of the roof in order to comply with wind uplift requirements of the project. The additional rows of attachment are positioned in equidistant rows between the rows of side lap fastening. The additional rows of attachment are flashed-in with an eight (8") inch (203 mm) wide strip of the same Soprafix base sheet.

3.15.2 - Side Lap Welding Techniques For Soprafix

A. To set one of the mechanically attached Soprafix base membrane plies described in 3.15.1 above, or Unilay, it must be completely unrolled, aligned and back rolled from both ends. Each subsequent roll is then heat welded into place using a puller and drawing the heat welded roll over the mechanically fastened side lap of the lower sheet. During this pulling action, the torch must be drawn in a pattern which heats and softens both the fixed bottom membrane of the side lap as well as the membrane section being unrolled. Special care must be taken to completely melt away the thermofusible plastic films. In addition, a continuous unrolling of the membrane will provide the best fusing of the lap. A weighted roller must be run over the lap to ensure the side lap seam is fully adhered. Particular attention must be given to the seam area behind plate or leading edge to ensure that the two membranes are matted and pushed together to create a strong seam connection. This method is required for Soprafix (X).

As an alternate, an approved hot air welder with a five (5") inch (127 mm) welding shoe may be used to heat weld the seam closed.

If the motion is stopped and the work is interrupted, then the subsequent roll must be pushed backward and restarted at the point where full adhesion exists across the side lap. Strings of SBS compound are evident when the roll is pushed back to its new re-start position. This ensures that the heat welding is continuous and voids are not created.

Note: Side lap welding technique ‘A’ above is mandatory on all applications which involve field uplift pressures in excess of either -30 psf or on projects requiring greater than a 63 mph wind warranty and with all self-adhered cap membranes (i.e. Colphene).
B. Unroll and permit the Soprafix roll approximately fifteen (15) minutes to relax. To set a mechanically attached membrane, it must be completely unrolled, aligned, and back rolled from both ends. Install the Soprema in lap fasteners and plates spaced as required for the project requirements. Overlay the next ply of membrane creating the specified width of side lap. Heat weld the seam closed by inserting the torch head deep in between the membranes and evenly heating both layers together creating a homogenous side lap with no voids. Special care must be taken to completely melt away the thermofusible plastic films. During heat fusing the seam, i.e. less than five seconds depending on ambient temperature, membrane temperature and the wind conditions, a weighted side lap roller weighing not more than seven (7 lbs) pounds (3.2 kg) must be worked down the side lap with light and consistent pressure being applied. Particular attention must be given to the seam area behind the plate or leading edge to ensure that the two membranes are matted and pushed together to create a strong seam connection. This will reduce, to the greatest possible extent, the possibility of voids and breaches in the membrane layer and it will help ensure a complete bond within the seam.

3.15.3 - Self-Adhered Side Lap & Self-Adhered Cap Membrane For Soprafix

A. Install the Soprafix-e or Soprafix-e FR membrane on to an acceptable substrate and align. When possible, align the membrane roll to run perpendicular to the steel deck flanges. Remove the release paper from the self-adhesive side lap and install Soprafix fasteners and plates at the midpoint of the side lap. Be careful not to contaminate or step on the exposed self-adhesive side lap.

B. Align the next roll of Soprafix membrane insuring that the underside of the second roll does not touch the first roll self-adhesive side lap area. The easiest way to do this is to chalk a “back” line where the up-slope edge of the second sheet will align, i.e. if a five (5”) inch (127 mm) lap is being used, then the line would be chalked thirty-four (34”) inches (864 mm) from the up-slope edge of the first sheet. After the second roll of Soprafix is unrolled and permitted to relax, backfold the sheet to expose the self-adhesive lap on the bottom side and align the up-slope edge to the chalkline. Cut a forty-five (45°) degree angle at the end lap areas and remove the release paper. Allow the second sheet to mate with the first sheet at the self-adhesive side lap area. Apply pressure using a hand roller to insure complete adhesion of the two membranes.

C. Using a hand held heat gun, heat and finger press in (an indent should show on the surface of the membrane) to create a seal at all “T” joints and hot air weld the minimum six (6”) inch (152 mm) wide end lap. The application shall provide a smooth surface, free of air pockets, wrinkles, fishmouths, or tears. Check and seal all voids using a hand held heat gun.

D. All Soprafix base membranes shall be run tight against all walls, curbs, parapets, and vents with fasteners placed as illustrated in the Approved Details section of this specification.

3.16 - Base Sheet Or Base Membrane Termination

A. The base sheet or base membrane shall extend to the ninety (90°) degree break, or the top of the cant strip if present, in the plane of the roof at penetrations or on the perimeter. Exception: Soprafix base membranes shall terminate at the base of the cant strip, if present.

3.17 - Glass Ply Sheet Installation

A. Install the glass ply sheet using the application method specified by the Designer Of Record or as required by these specifications and details.

B. Glass ply sheet side laps shall be a minimum of two (2”) inches (51 mm) wide.

C. All ply sheet end laps shall be a minimum of six (6”) inches (152 mm) wide.
D. Ply sheet side laps and end laps shall be staggered a minimum of twelve (12") inches (305 mm) from the side laps and end laps of successive plies.

3.17.1 - Hot Asphalt Attachment Of Glass Ply Sheets

A. Install the glass ply sheet in hot asphalt at the rate of twenty-five (25 lbs.) pounds per one hundred (100) square feet (1.2 kg/m²) plus or minus twenty (20%) percent.
B. The ply sheet side laps and end laps shall be fully adhered with asphalt.
C. The ply sheet must lay flat and be fully bonded to the substrate or base sheet. Sopra IV and Sopra VI must be broomed to insure embedment.
D. The ply sheet must extend far enough to accommodate flashing requirements as specified by the Designer Of Record or as illustrated in the detail section of this specification.
E. Foot and machine traffic shall be kept to a minimum on freshly applied components of the system to reduce the possibility of asphalt displacement from point loading.
F. Discontinue application of hot asphalt over any substrate where the asphalt foams.

3.17.2 - Cold Adhesive Attachment Of Glass Ply Sheets

A. Soprema FM Adhesive Squeegee Grade, FM Adhesive (VOC) Squeegee Grade, FM Adhesive (VOC-1) Squeegee Grade or High Velocity Membrane Adhesive may be used to cold process adhere ply sheets. None of these products may be used for vertical applications. Use trowel grade blends of each of these adhesives for vertical or flashing applications.
B. HVMA, FM Adhesive (VOC) Squeegee Grade, and FM Adhesive (VOC-1) Squeegee Grade are squeegee or trowel applied only. FM Adhesive Squeegee Grade may either be squeegee, trowel, or spray applied with specific spray equipment.
C. All HVMA seams are either hot air welded or heat welded using a propane torch.
D. Squeegee, trowel, or spray apply the specified cold adhesive to the base sheet at the rate of one and one-half to two gallons (1½ - 2 gal/100ft²) per one hundred square feet (0.61 - 1.63 L/m²).
E. Apply the adhesive in an area slightly larger than the width of the sheet. Allow five (5) to fifteen (15) minutes for “flash-off” time before embedding the ply sheet. Flash-off time will vary depending on sunlight available, humidity, wind, and ambient temperature.
F. At the three (3") inch (76 mm) wide side laps and six (6") inch (152 mm) wide end laps, the adhesive shall be installed so that a one-quarter (¼") inch (6.4 mm) bead of adhesive is visible.

3.17.3 - Two Ply Interply Application Of Glass Ply Sheets

A. Install one eighteen (18") inch (457 mm) wide ply sheet followed by one thirty-six (36") inch (914 mm) wide ply sheet as starter plies.
B. Install a second thirty-six (36") wide (914 mm) wide ply sheet that laps the first thirty-six (36") inch (914 mm) wide ply sheet by nineteen (19") inches (483 mm) which leaves seventeen (17") inches (432 mm) of the first full starter ply exposed.
C. Lap successive plies nineteen (19") inches (483 mm) which leaves seventeen (17") inches (432 mm) of the previous ply exposed.
3.17.4 - Three Ply Interply Application Of Glass Ply Sheets

A. Install one twelve (12”) inch (305 mm) wide ply sheet followed by one twenty-four (24”) inch (610 mm) and one thirty-six (36”) inch (914 mm) wide ply sheet as starter plies.

B. Install a second thirty-six (36”) wide (914 mm) wide ply sheet that laps the first thirty-six (36”) inch (914 mm) wide ply sheet by twenty-four and two-thirds (24.66”) inches (626 mm) which leaves eleven and one-third (11.33”) inches (288 mm) of the first full starter ply exposed.

C. Lap successive plies twenty-four and two-thirds (24.66”) inches (626 mm) which leaves eleven and one-third (11.33”) inches (288 mm) of the previous ply exposed.

3.17.5 - Four Ply Interply Application Of Glass Ply Sheets

A. Install one nine (9”) inch (229 mm) wide ply sheet followed by one eighteen (18”) inch (457 mm) wide ply sheet followed by one twenty-seven (27”) inch (686 mm) and one thirty-six (36”) inch (914 mm) wide ply sheet as starter plies.

B. Install a second thirty-six (36”) wide (914 mm) wide ply sheet that laps the first thirty-six (36”) inch (914 mm) wide ply sheet by twenty-seven and one-half (24½”) inches (622 mm) which leaves eight and one-half (8½”) inches (216 mm) of the first full starter ply exposed.

C. Lap successive plies twenty-seven and one-half (24½”) inches (622 mm) which leaves eight and one-half (8½”) inches (216 mm) of the previous ply exposed.

3.18 - Modified Bitumen Ply Membrane Installation

A. Install the modified bitumen ply membrane using the application method specified by the Designer Of Record or as required by these specifications and details.

B. All modified bitumen ply membrane side laps shall be a minimum of three (3”) inches (76 mm) wide.

C. All modified bitumen ply membrane end laps shall be a minimum of six (6”) inches (152 mm) wide.

D. All modified bitumen ply membrane side laps and end laps shall be staggered a minimum of twelve (12”) inches (305 mm) from the side laps and end laps of successive plies. The practice of belly-banding is prohibited for all warrantied projects.

E. For a two (2) ply system, begin with a half sheet by cutting the base sheet in half lengthwise on the first membrane installed. There is no ply membrane in a two ply system.

F. For a three (3) ply system, continue with a two-thirds width sheet over the one-third width base membrane by cutting the ply membrane to two-thirds sheet width on the first sheet installed.

3.18.1 - Hot Asphalt Attachment Of Modified Bitumen Ply Membrane

A. Install the modified bitumen ply membrane in hot asphalt at the rate of twenty-five (25 lbs.) pounds per one hundred (100) square feet (1.2 kg/m²) plus or minus twenty (20%) percent.

B. The modified bitumen ply membrane side laps and end laps shall be fully adhered with asphalt.

C. The modified bitumen ply membrane must lay flat and be fully bonded to the substrate or base membrane.

D. The modified bitumen ply membrane must extend far enough to accommodate flashing requirements as specified by the Designer Of Record or as illustrated in the detail section of this specification.
E. Foot and machine traffic shall be kept to a minimum on freshly applied components of the system to reduce the possibility of asphalt displacement from point loading.

F. Discontinue application of hot asphalt over any substrate where the asphalt foams.

3.18.2 - Heat Welded Attachment Of Modified Bitumen Ply Membrane

A. Beginning at the low point of the roof, unroll one-half of the first roll for positioning, and re-roll.

B. Soprema recommends that the heat welding operator be positioned in front of the roll and use a metal pole with a hook configuration to pull the roll towards installation as opposed to being positioned behind the roll being installed and pushing the roll.

C. Beginning at the re-rolled portion of the ply sheet, apply the heat evenly across the bottom of the roll and along the exposed side lap of the previously installed roll.

D. Apply enough heat to melt the film on the bottom of the modified bitumen ply membrane and the lap on the previously installed sheet. The polyester or glass reinforced modified bitumen ply membrane has softened enough to roll into place when a small bead of bitumen can be seen in front of the roll and at the side lap.

E. Re-roll the unadhered portion of the modified bitumen ply membrane and repeat the above method to complete installation of the roll.

F. Foot and machine traffic shall be kept to a minimum on freshly applied components of the system to reduce the possibility of asphalt displacement from point loading.

3.18.3 - Cold Process Attachment Of Modified Bitumen Ply Membrane

A. Soprema FM Adhesive Squeegee Grade, FM Adhesive (VOC) Squeegee Grade, FM Adhesive (VOC-1) Squeegee Grade or HVMA may be used to cold process adhere a modified bitumen ply membrane. None of these products may be used for vertical applications. Use trowel grade blends of each of these adhesives for vertical or flashing applications.

B. HVMA, FM Adhesive (VOC) Squeegee Grade, or FM Adhesive (VOC-1) Squeegee Grade are squeegee or trowel applied only. FM Adhesive Squeegee Grade may either be squeegee, trowel, or spray applied with specific spray equipment.

C. All HVMA seams are either hot air welded or heat welded using a propane torch.

D. Squeegee, trowel, or spray apply the specified cold adhesive to the modified bitumen ply membrane at the rate of one and one-half to two gallons (1 ½ - 2 gal/100ft²) per one hundred square feet (0.61 - 1.63 L/m²).

E. Apply the adhesive in an area slightly larger than the width of the sheet. Allow five (5) to fifteen (15) minutes for “flash-off” time before embedding the modified bitumen ply membrane. Flash-off time will vary depending on sunlight available, humidity, wind, and ambient temperature.

F. At the three (3") inch (76 mm) wide side laps and six (6") inch (152 mm) wide end laps, the adhesive shall be installed so that a one-quarter (¼") inch (6.4 mm) bead of adhesive is visible.

3.19 - Modified Bitumen Cap Membrane Installation

A. Install the modified bitumen cap membrane using the application method specified by the Designer Of Record or as required by these specifications and details.

B. All cap membrane side laps shall be a minimum of three (3") inches (76 mm) wide.
C. All cap membrane end laps shall be a minimum of six (6") inches (152 mm) wide.

D. All cap membrane side laps and end laps shall be staggered a minimum of twelve (12") inches (305 mm) from the side laps and end laps of preceding plies. *The practice of belly-banding is prohibited for all warrantied projects.*

E. For a two (2) ply system, begin with a half sheet by cutting the base membrane in half lengthwise on the first sheet installed.

F. For a three (3) ply system, begin with a one-third sheet by cutting the base membrane into thirds on the first sheet installed.

3.19.1 - Hot Asphalt Attachment Of Modified Bitumen Cap Membrane

A. Install the cap membrane in hot asphalt at the rate of twenty-five (25 lbs.) pounds per one hundred (100) square feet (1.2 kg/m²) plus or minus twenty (20%) percent.

B. The cap membrane side laps and end laps shall be fully adhered with asphalt.

C. The cap membrane must lay flat and be fully bonded to the base or ply membrane.

D. The cap membrane must extend far enough to accommodate flashing requirements as specified by the Designer Of Record or as illustrated in the detail section of this specification.

E. Foot and machine traffic shall be kept to a minimum on freshly applied components of the system to reduce the possibility of asphalt displacement from point loading.

F. Discontinue application of hot asphalt over any substrate where the asphalt foams.

3.19.2 - Heat Welded Attachment Of Cap Membrane

A. Beginning at the low point of the roof, unroll one-half of the first roll for positioning, and re-roll.

B. Soprema recommends that the heat welding operator be positioned in front of the roll and use a metal pole with a hook configuration to pull the roll towards installation as opposed to being positioned behind the roll being installed and pushing the roll.

C. Beginning at the re-rolled portion of the ply membrane, apply the heat evenly across the bottom of the roll and along the exposed side lap of the previously installed roll.

D. Apply enough heat to melt the film on the bottom of the cap membrane and the lap on the previously installed sheet. The cap membrane has softened enough to roll into place when a small bead of bitumen can be seen in front of the roll and at the side lap.

E. Re-roll the unadhered portion of the cap membrane and repeat the above method to complete installation of the roll.

F. Foot and machine traffic shall be kept to a minimum on freshly applied components of the system to reduce the possibility of asphalt displacement from point loading.

3.19.3 - Cold Process Attachment Of Cap Membrane

A. Soprema FM Adhesive Squeegee Grade, FM Adhesive (VOC) Squeegee Grade, FM Adhesive (VOC-1) Squeegee Grade or HVMA may be used to cold process adhere a cap membrane. None of these products may be used for vertical applications. Use trowel grade blends of each of these adhesives for vertical or flashing applications.
B. HVMA, FM Adhesive (VOC) Squeegee Grade, or FM Adhesive (VOC-1) Squeegee Grade are squeegee or trowel applied only. FM Adhesive Squeegee Grade may either be squeegee, trowel, or spray applied with specific spray equipment.

C. All HVMA seams are either hot air welded or heat welded using a propane torch.

D. Squeegee, trowel, or spray apply the specified cold adhesive to the cap membrane at the rate of one and one-half to two gallons (1½ - 2 gal/100ft²) per one hundred square feet (0.61 - 1.63 L/m²).

E. Apply the adhesive in an area slightly larger than the width of the sheet. Allow five (5) to fifteen (15) minutes for “flash-off” time before embedding the cap membrane. Flash-off time will vary depending on sunlight available, humidity, wind, and ambient temperature.

F. At the three (3”) inch (76 mm) wide side laps and six (6”) inch (152 mm) wide end laps, the adhesive shall be installed so that a one-quarter (¼”) inch (6.4 mm) bead of adhesive is visible prior to applying granules.

3.19.4 - Self-Adhered Attachment Of Cap Membrane

A. Unroll, position, and align the length of self-adhered cap membrane at the lowest point of the roof with the release poly covered selvage edge on the up-slope side.

B. If beginning at a drain, it will be necessary to prepare the lap area on the opposite side of the factory prepared lap area. For self-adhered cap membranes with granules on the top surface, the overlap area must be either sealed by heat welding with hot air or an open torch after the granules are embedded.

C. After the cap membrane is placed in its final position, re-roll so that one-half of the sheet is rolled up. Using a straight blade utility knife, carefully score the release poly across the width of the roll.

D. Roll the self-adhered cap membrane in to its final position as the release poly is being removed. Re-roll the remaining section of the self-adhered cap membrane and repeat the process.

E. Align successive sheets with three (3”) inch (76 mm) wide side laps and six (6”) inch (152 mm) wide end laps.

3.20 - Flashing Installation - General Guidelines

A. All flashings shall be installed as specified by the Designer Of Record or as required by these specifications and details. In all cases, the most stringent requirement will prevail.

B. Refer to the Approved Details section of this specification for illustrations of typical penetration and perimeter flashings.

C. Approved Detail references to “field base membrane ply” refer to the first ply of the membrane system in the field of the roof. Approved Detail references to “membrane flashing ply” refer to the first ply of the membrane flashing system.

D. Textured or spalled masonry, stucco, exterior insulated finishing systems* (EIFS), cobblestone, corrugated metal panels, and uneven substrates of any kind require the installation of an acceptable overlayment prior to flashing. Acceptable overlayers would include minimum one-half (⅛”) inch (12.7 mm) thick exterior grade plywood or minimum one-eighth (¼”) inch (3 mm) Soprema Sopraboard. The overlayment is fastened as specified by the Designer Of Record or as specified in the Approved Details section of this specification or as determined by the Soprema Technical Department.

* Required if the minimum flashing height of eight (8”) inches (203 mm) cannot be achieved below the EIFS.

E. All metal, masonry, and wood components that come into contact with flashing material must be primed with Elastocol 400 or 500 or other ASTM D 41 asphalt primer. Elastocol 600c is required when self-adhered
membranes are used over non-asphaltic based or coated materials.

F. The minimum flashing height of a membrane flashing ply is eight (8") inches (203 mm) above the surface of the roof on new construction. On reroof, existing building features may not permit the minimum flashing height to be achieved. In these cases, contact the Soprema Technical Department for alternative flashing details. The minimum flashing height for pitch pans is four (4") inches (102 mm) above the surface of the roof.

G. The maximum flashing height of a membrane flashing ply, without using a high wall flashing detail, is twenty-four (24") inches (610 mm) above the surface of the roof. In all circumstances, self-adhered flashing membranes are limited to twenty-four (24") inches (610 mm).

H. The width of a section of flashing is limited to the width of a roll of membrane, thirty-nine and three-eights (39 3/8) inches (1 m). Field and flashing side laps must be offset from one another a minimum of six (6") inches (152 mm).

I. The top of all cap sheet flashing must be fastened at the rate specified by the Designer Of Record or as specified in the Approved Details section of this specification.

J. On reroof projects, all existing flashings must be removed including lead, felts, and bitumen from walls and penetrations.

K. All flashings shall be mounted to the surface specified by the Designer or Record or as specified in the Approved Details section of this specification.

L. New copper surfaces that will come into contact with flashing materials must be cleaned with acetone or lacquer thinner before applying primer to the surface.

3.20.1 Flashing Installation Techniques

A. The descriptions of flashing in this section suggest certain techniques. The suggested techniques represent only one way that the detail may be correctly completed. Alternate techniques are also acceptable as long as overlap and fastening requirements are satisfied. The written descriptions in this section are designed to be supplemental to the details in the Approved Details section of this specification.

3.20.2 - Walls, Curbs, & Expansion Joints With Cant Strips

A. Install the field base membrane ply so that it extends to the top of the cant strip. Exception: on Soprafix systems, the field base membrane extends to the toe of the cant strip.

B. Install the membrane flashing ply that extends a minimum of four (4") inches (102 mm) past the toe of the cant strip on the horizontal surface, up the face of the cant strip, and a minimum of eight (8") inches (203 mm) above the surface of the roof.

C. Install the field cap membrane ply so that it butts to the toe of the cant strip and completely covers the membrane flashing ply that extends a minimum of four (4") inches (102 mm) onto the horizontal surface.

D. For a heat welded or mop applied cap membrane flashing ply, the granules on the six (6") inch (152 mm) lap at the toe of the cant strip must be heated and embedded before the cap membrane flashing ply can be installed. A chalk line six (6") inches (152 mm) out from the toe of the cant strip will greatly improve the chances for a straight line of granule embedment.

E. For a cold adhesive applied cap membrane flashing ply, the six (6") inch (152 mm) lap at the toe of the cant strip must be primed with Elastocol 500, or other ASTM D 41 primer, before the cap membrane
flashing ply can be installed. A chalk line or strip of tape six (6") inches (152 mm) out from the toe of the cant strip will greatly improve the chances for a straight line of granule embedment.

F. For a self-adhered cap membrane flashing ply, the six (6") inch (152 mm) lap at the toe of the cant strip must be primed with Elastocol 400 or 500, or other ASTM D 41 primer, before the cap membrane flashing ply can be installed. A chalk line or strip of tape six (6") inches (152 mm) out from the toe of the cant strip will greatly improve the chances for a straight line of granule embedment. The six (6") inch (152 mm) lap on the horizontal surface, as well as all of the vertical side laps, must be heat welded.

G. When specified by the Designer Of Record, or as specified in the Approved Details section of this specification, mechanical termination eight (8") inches (203 mm) on center is required at the top of the flashing.

H. Install the specified counter-flashing, or Alsan Flashing, over the top termination to complete the detail.

3.20.3 - Walls, Curbs, & Expansion Joints Without Cant Strips

A. Install the field base membrane ply so that it extends to the base of the wall, curb, or expansion joint at the ninety (90°) degree change in angle.

B. Install the membrane flashing ply that extends a minimum of four (4") inches (102 mm) past the base of the wall, curb, or expansion joint on the horizontal surface, and a minimum of eight (8") inches (203 mm) above the surface of the roof.

C. Install the field cap membrane ply so that it butts to the base of the wall, curb, or expansion joint on the horizontal surface and completely covers the membrane flashing ply that extends a minimum of four (4") inches (102 mm) onto the horizontal surface.

D. For a heat welded or mop applied cap membrane flashing ply, the granules on the six (6") inch (152 mm) lap at the ninety (90°) degree change in angle must be heated and embedded before the cap membrane flashing ply can be installed. A chalk line six (6") inches (152 mm) out from the ninety (90°) degree change in angle will greatly improve the chances for a straight line of granule embedment.

E. For a cold adhesive applied cap membrane flashing ply, the six (6") inch (152 mm) lap at the ninety (90°) degree change in angle must be primed with Elastocol 400 or 500, or other ASTM D 41 primer, before the cap membrane flashing ply can be installed. A chalk line or strip of tape six (6") inches (152 mm) out from the lap at the ninety (90°) degree change in angle will greatly improve the chances for a straight line of granule embedment.

F. For a self-adhered cap membrane flashing ply, the six (6") inch (152 mm) lap at the ninety (90°) degree change in angle must be primed with Elastocol 400 or 500, or other ASTM D 41 primer, before the cap membrane flashing ply can be installed. A chalk line or strip of tape six (6") inches (152 mm) out from the ninety (90°) degree change in angle will greatly improve the chances for a straight line of granule embedment. The six (6") inch (152 mm) lap on the horizontal surface, as well as all of the vertical side laps, must be heat welded.

G. When specified by the Designer Of Record, or as specified in the Approved Details in this specification, mechanical termination eight (8") inches (203 mm) on center is required at the top of the flashing.

H. Install the specified counter-flashing, or Alsan Flashing, over the top termination to complete the detail.

3.20.4 - Cast Iron Roof Drains

A. Build a sump to the drain and create a smooth transition by installing tapered insulation around the drain. The
slope of the drain sump shall not exceed one (1") inch per horizontal foot (8%). The drain sump should be four foot by (4’x4’) four foot (1.2 m x 1.2 m) minimum.

B. Apply Elastocol 400 or 500 Primer, or other ASTM D 41 asphalt primer, to the top of the drain bowl where the clamping will seat and permit to dry.

C. Install a minimum eight (8") inch (203 mm) wide bed of Soprema SBS Elastic Cement onto the drain flange and out onto the insulation prior to embedding the field base membrane ply into the cement. After embedding the field base membrane ply, apply another bed of SBS Elastic Cement on top of the base ply prior to the application of the primed drain lead flashing.

D. Install the base sheet so that the side lap for the initial base sheet joint occurs down the center of the drain bowl. Install the base sheet so that end laps do not occur within the drain sump.

E. The base membrane ply, lead drain flashing, reinforcing and membrane plies extend under the clamping ring a minimum of one (1") inch (25 mm). The lead is turned down into the bowl a minimum of one (1") inch (25 mm).

F. Install the field cap membrane ply so that the side laps do not occur under the clamping ring. Install the field cap membrane ply so that end laps do not occur within the drain sump.

G. Install the clamping ring and drain bolts shall be installed to provide continuous compression between the top of the drain bowl and the clamping ring.

3.20.5 - Roof Edge Metal

A. Install the wood blocking, insulation, coverboard and field base membrane ply as specified by the Designer Of Record or as required by these specifications and details.

B. Prime the top and bottom of the flange of the metal edge with Soprema Elastocol 400 or 500, or other ASTM D 41 asphalt primer, and permit to dry.

C. Install a minimum four (4") inch (102 mm) wide bed of Soprema SBS Elastic Cement where the metal flange will seat. Fasten the metal flange three (3") inches (76 mm) on center staggered.

D. Cut a polyester reinforced section of flashing strip that is wide enough to lap three (3") inches (76 mm) on to the field base membrane ply and flash-in all of the fastener heads of the fasteners used to anchor the edge metal.

E. Install the field cap membrane ply so that it butts to the edge of the metal or the base of the gravel stop.

F. Apply a three-eighths (3/8") inch (9.5 mm) round bead of Soprema SBS Elastic Cement to the outside edge of the cap sheet.

3.20.6 - Inside Corners

A. Install the field base membrane ply so that it butts to the base of the wall at both sides of the corner.

B. Install the first membrane flashing ply so that there is a four (4") inch (102 mm) lap on the horizontal surface and a three (3") inch (76 mm) lap on the vertical surface that rounds the corner. This will require a three inch by (3” x 4”) four inch (76 mm x 102 mm) section of the flashing to be removed from the first membrane flashing ply.

C. Install the first membrane flashing ply on the other side of the corner so that it butts to the vertical inside corner and flashes in the three (3”) inch (76 mm) section that laps around the corner on the vertical surface from the first membrane flashing ply. At the base of the second membrane flashing ply, a small section of the
D. Cut a gusset of Sopralene 180 membrane that measures four (4") inches (102 mm) wide by eight (8") inches (203 mm) high. The gusset is placed so that it extends two (2") inches (51 mm) on to the horizontal surface, and around each side of the inside corner, as well as six (6") inches (152 mm) high. A “pigear” fold is required in the two inch (2” x 2") by two inch (51 mm x 51 mm) section of the gusset on the horizontal surface.

E. Install the field cap membrane ply and embed the granules if required for the flashing attachment method.

F. Install the first cap membrane flashing ply so that there is a six (6") inch (152 mm) lap on the horizontal surface and a three (3") inch (76 mm) lap on the vertical surface that rounds the corner. This will require a three inch by (3” x 6") six inch (76 mm x 152 mm) section of the flashing to be removed from the first membrane flashing ply. It will also require granule embedment on the three (3") inch (76 mm) vertical lap and the portion of first cap membrane flashing ply on the horizontal that will be lapped by the final section of cap membrane flashing.

G. Install the final cap membrane flashing ply on the other side of the corner so that it butts to the vertical inside corner and flashes in the three (3") inch (76 mm) section that laps around the corner on the vertical surface from the first cap membrane flashing ply. At the base of the second cap membrane flashing ply, a small section of the base lap is removed by making cut at a forty-five (45°) degree angle beginning at the inside corner.

3.20.7 - Outside Corners

A. Install the field base membrane ply so that it butts to the base of the curb at both sides of the corner.

B. Install the first membrane flashing ply so that there is a four (4") inch (102 mm) lap on the horizontal surface and a three (3") inch (76 mm) lap on the vertical surface that rounds the corner. This will require a three inch by (3” x 4") six inch (76 mm x 102 mm) section of the flashing to be removed from the first membrane flashing ply.

C. Install the first membrane flashing ply on the other side of the corner so that it butts to the vertical outside corner and flashes in the three (3") inch (76 mm) section that laps around the corner on the vertical surface from the first membrane flashing ply. At the base of the second membrane flashing ply, a small section of the base lap is removed by making cut at a forty-five (45°) degree angle beginning at the inside corner.

D. Cut a gusset of Sopralene 180 membrane that measures four (4") inches (102 mm) wide by eight (8") inches (203 mm) high. On one end of the gusset, cut out two forty-five (45°) degree by two (2") inch (51 mm) deep sections so that the gusset comes to a point. The gusset is placed so that it extends two (2") inches (51 mm) on to the horizontal surface, and around each side of the inside corner, as well as six (6") inches (152 mm) high. The cut out point is on the horizontal surface.

E. Install the field cap membrane ply and embed the granules if required for the flashing attachment method.

F. Install the first cap membrane flashing ply so that there is a six (6") inch (152 mm) lap on the horizontal surface and a three (3") inch (76 mm) lap on the vertical surface that rounds the corner. This will require a three inch by (3” x 6") six inch (76 mm x 152 mm) section of the flashing to be removed from the cap membrane flashing ply. It will also require granule embedment on the three (3") inch (76 mm) vertical lap and the portion of first cap membrane flashing ply on the horizontal that will be lapped by the final section of cap membrane flashing ply.

G. Install the final cap membrane flashing ply on the other side of the corner so that it butts to the vertical outside corner and flashes in the three (3") inch (76 mm) section that laps around the corner on the vertical surface from the first cap membrane flashing ply. At the base of the second cap membrane flashing ply, a small...
section of the base lap is removed by making cut at a forty-five (45°) degree angle beginning at the outside corner.

3.20.8 - Pipes With Flashing Sleeves

A. Install the field base membrane ply. In most cases, it will be necessary to make a relief cut in the base membrane ply in order to maneuver around the pipe.

B. Apply Elastocol 400 or 500 Primer, or other ASTM D 41 asphalt primer, to both the top and bottom of the lead flashing boot flange and permit to dry.

C. Install a bed of Soprema SBS Elastic Cement onto the base sheet where the lead boot flange will seat. The lead boot flange shall be positioned so that it is diagonal to the base sheet field seams.

D. Cut a section of polyester reinforced membrane flashing that is a minimum of four (4") inches (102 mm) larger than the lead boot flange and large enough to flash in the relief cut in the field base membrane ply. Install the section of polyester reinforced membrane flashing, also diagonal to the base sheet field seams, over the lead boot flange using the specified installation method.

E. Install the field cap membrane ply using the specified installation method. It is common to place a field cap membrane end lap next to a pipe. In this application, the first ply of the cap sheet is extended a minimum of six (6") inches (152 mm) past the pipe and the granules are embedded if required for the application method. The adjoining sheet is installed in accordance with the specified application method.

3.20.9 - Welded Watertight Scuppers

A. Install the field base membrane ply so that it extends through the scupper opening and extends down the outside face.

B. Install the first membrane flashing ply so that there is a four (4") inch (102 mm) lap on the horizontal surface.

C. Apply Elastocol 500, or other ASTM D 41 asphalt primer, to the top and bottom of the scupper flange and allow to dry.

D. Install a bed of Soprema SBS Elastic Cement onto the scupper flanges, set the scupper into the wall opening and fasten into the wood nailer and wall three (3") inches (76 mm) on center. The fasteners shall be staggered and flush.

E. Install a ply of polyester reinforcing membrane that extends a minimum of two (2") inches (51 mm) past the scupper flange fasteners in all directions.

F. Install the field cap membrane ply so that it butts to the base of the scupper and adjoining wall on the horizontal surface and completely covers the membrane flashing ply that extends a minimum of four (4") inches (102 mm) onto the horizontal surface.

G. See section 3.20.3 Walls, Curbs, & Expansion Joints Without Cant Strips for specifics on completing installation of the cap sheet.

3.20.10 - Penetration Pocket

A. Install the field base membrane ply so that it extends around the penetration. In most cases, it will be necessary to make a relief cut in the base membrane ply in order to maneuver around the pipe.

B. Apply Elastocol 400 or 500 Primer, or other ASTM D 41 asphalt primer, to both the top and bottom of the metalpenetration pocket flange and permit to dry.
C. Install a bed of Soprema SBS Elastic Cement onto the base sheet where the minimum four (4") inch (102 mm) wide metal flange will seat. Fasten the flange into the wood nailer three (3") inches (76 mm) on center. The fasteners shall be staggered and flush.

D. Cut a section of polyester reinforced membrane flashing that is a minimum of four (4") inches (102 mm) larger than the metal flange and large enough to flash in the relief cut in the field base membrane ply. Install the section of polyester reinforced membrane flashing over the metal flange using the specified installation method.

E. Install the field cap membrane ply using the specified installation method. It is common to place a field cap membrane end lap next to a pipe. In this application, the first ply of the cap sheet is extended a minimum of six (6") inches (152 mm) past the pocket and the granules are embedded if required for the application method. The adjoining sheet is installed in accordance with the specified application method.

F. Apply a three-eighths (3/8") inch (9.5 mm) round bead of Soprema SBS Elastic Cement to the outside edge of the cap sheet adjoining the penetration pocket.

G. Install as much non-shrinking grout as is necessary to establish a base for the pourable sealant and permit to dry. Install a minimum of two (2") inches (51 mm) of pourable sealant that is crowned for drainage.

3.21 - Sheet Metal Installation

A. Install the metal edge system as specified by the Designer Of Record or as required by these specifications and details.

B. All horizontal metal flanges shall be a minimum of three and one-half (3½") inches (90 mm) wide, overlap a minimum of three (3") inches (76 mm), and be fastened four (4") inches (102 mm) on center to wood nailers. All metal flashing overlaps shall be coated with Elastocol 400 or 500, or other ASTM D 41 asphalt primer and SBS Elastic Cement.

C. Install a minimum four (4") inch (102 mm) wide bed of Soprema SBS Elastic Cement where the metal flange will seat.

D. Cut a polyester reinforced section of flashing strip that is wide enough to lap three (3") inches (76 mm) on to the field base membrane ply and flash-in all of the fastener heads of the fasteners used to anchor the sheet metal.

E. Install the field cap membrane ply so that it butts to the edge of the horizontal edge of the metal.

F. Apply a three-eighths (3/8") inch (9.5 mm) round bead of Soprema SBS Elastic Cement to the outside edge of the cap sheet.

G. All metal counter-flashing shall have a minimum vertical dimension of four (4") inches (102 mm) with a minimum one-half (1/2") inch (13 mm) thirty (30°) degree drip bend. The bottom edge of the metal counter-flashing shall cover the top of the membrane flashing a minimum of four (4") inches (102 mm). Metal counter-flashing shall be fastened twelve (12") inches (305 mm) on center with fasteners that have a washer or other feature that makes them watertight.

3.22 - Temporary Closures

A. Temporary closures must be used to protect the finished roof system from infiltration of water during inclement weather while the roof is under construction.
B. The temporary tie-in materials shall extend from a minimum of twenty-four (24") inches (610 mm) past the last course of insulation. The tie-in area on the existing roof, or new roof deck, must be clean, smooth, dry, and free of debris or contaminants. Install a continuous application of asphalt or roofing cement on to the tie-in material and the tie-in area. Embed the tie-in material into the asphalt or roofing cement and provide continuous compression over the entire length of the tie-in. Temporary tie-ins left for more than overnight must be checked daily to confirm that the seal has remained intact.

C. All temporary tie-in material must be completely removed prior to continuing installation of the new roofing system.

3.23 - Cap Sheet Repair

A. Any large, unsealed wrinkle or fishmouth must be cut so that the cap sheet lays flat and does not create a hump or void. The affected area shall be heated to ensure the exposed flaps lay flat, and to embed granules.

B. The repair section must extend a minimum of six (6") inches (152 mm) past the split in all directions.

C. The repair section cap membrane must be fused to the existing cap sheet with hot asphalt or by heat welding. When heat welding granule embedment on the in-place cap membrane is required.

D. As an alternate to repairing with a section of cap membrane, Alsan Flashing Detail AFR-001 may be used.

E. Any open side or end laps shall be repaired by reheating and resealing or using one of the repairs described above.

3.24 - Roof Walkways

A. Walkways may consist of Soprema Soprawalk or an additional layer of cap membrane installed with hot asphalt or by heat welding.

B. Sections of walkway should be no longer than ten (10') feet (3 m) in length and gapped four (4") inches (102 mm) from adjoining sections.

C. Soprema recommends that the walkways be identified by using a different color granule surface or by painting lines with a compatible coating.

3.25 - Protected Membrane Roof Installation

A. Install the Soprema SBS roofing system in accordance with the project specification or these specifications.

B. Install only as much insulation as can be covered with filter fabric and ballast before the end of the work day or the onset of inclement weather.

C. Install the polystyrene roof insulation directly on the roof system with the channel side down, if applicable. The insulation boards shall be tightly butted together. The maximum acceptable gap between insulation boards is one-quarter (¼") inch (6.4 mm). All insulation boards shall be installed within one-quarter (¼") inch (6.4 mm) of all projections and cant strips. The insulation shall not be bonded to the roof surface.

D. For multiple layer assemblies, all joints in all layers shall be staggered. In multiple layer applications, the bottom layer of insulation must be a minimum of two (2") inches thick (51 mm) or as thick as, or thicker than, the successive layers.

E. Install a layer of acceptable filter fabric over the polystyrene insulation. Lap all joints in the filter fabric a minimum of six (6") inches (152 mm). End laps of the filter fabric must not occur within six (6') feet of the building perimeter. Install an additional layer of filter fabric around all roof projections. The additional layer
of filter fabric shall extend a minimum of four (4') feet (1.2 m) beyond the projection in all directions. The filter fabric shall extend a minimum of two (2") inches (51 mm) above the stone at the perimeter and all roof penetrations. Wetting the filter fabric is helpful in holding it in place on the polystyrene until the ballast is applied.

F. Install the correct size ballast at the minimum rate of ten (10 lbs.) pounds per square foot (48.8 kg/m²) in the field of the roof and twenty (20 lbs.) pounds per square foot (97.6 kg/m²) over a four (4') foot (1.2 m) wide area at the roof perimeter and around all penetrations.

End of Section
November 2008

Section 4 - System Selection

Table of Contents

<table>
<thead>
<tr>
<th>Section Titles</th>
<th>Page Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>4.00 General</td>
<td>4-2</td>
</tr>
<tr>
<td>4.01 System &amp; Membrane Abbreviations &amp; Numbers</td>
<td>4-2</td>
</tr>
<tr>
<td>4.02 System Design</td>
<td>4-6</td>
</tr>
</tbody>
</table>
4.00 - General

A. This section of the Soprema, Inc. Technical Specification Manual shall be used in conjunction with Section 2 - General Requirements, Section 3 - SBS Application, and Modified Bitumen Flashing Details as they are applicable to project design and installation.

B. Furnish and install the specified Soprema roofing system in accordance published specification and details as well as the project specification by the Designer of Record. This section of the specification is designed to address the membrane assembly part of system selection.

4.01 - System & Membrane Abbreviations & Numbers

A. The following abbreviations are used in conjunction with designating which Soprema system is being selected for a project:

Prefixes:

- IS = Insulated Steel Deck System
- IC = Insulated Concrete Deck System
- IL = Insulated LWIC or LWICC Deck System
- IW = Insulated Wood Deck System
- IF = Insulated CWF Deck System
- IG = Insulated Gypsum Deck System
- IR = Insulated Recover Deck System

* Typically PMR systems only

- US = Uninsulated Steel Deck System
- UC = Uninsulated Concrete Deck System
- UL = Uninsulated LWIC or LWICC Deck System
- UW = Uninsulated Wood Deck System
- UF = Uninsulated CWF Deck System
- UG = Uninsulated Gypsum Deck System

- UG = Uninsulated Recover Deck System

Suffixes:

- A = Asphalt Attached
- C = Cold Process Attached
- H = Heat Welded Attached
- M = Mechanically Attached
- S = Self-Adhered Attached

B. Base Sheets For Hot Asphalt, Cold Adhesive, & Mechanically Fastened Applied Base & Hot Asphalt & Cold Adhesive Cap Membrane Systems:

- 02 = Sopra-G - ASTM D 4601, Type 2
- 03 = Modified Sopra-G - ASTM D 4601, Type 2
- 03B = Modified Sopra-G SAS - ASTM D 4601, Type 2
- 05 = Soprabase - ASTM D 5147
- 05A = Soprabase S - ASTM D 5147

C. Ply Sheets For Hot Asphalt Applied Ply Sheet And Cap Membrane Systems:

- 04 = Sopra IV - ASTM D 2178, Type IV
- 06 = Sopra VI - ASTM D 2178, Type VI

D. Base Membranes For Hot Asphalt or Cold Adhesive Applied Base and Cap Membrane Systems:

- 20 = Elastophene 180 Sanded - ASTM D 6164, Type 1, Grade S
- 21 = Sopralene 180 Sanded - ASTM D 6164, Type 1, Grade S
- 21B = Sopralene 180 Sanded 2.2 mm - ASTM D 6164, Type 1, Grade S
- 22 = Sopralene 250 Sanded* - ASTM D 6164, Type 2, Grade S
- 25 = Elastophene Sanded - ASTM D 6163, Type 1, Grade S

* Typically PMR systems only

PDS values:

- PDS = 100
- PDS = 101
- PDS = 103
- PDS = 110
- PDS = 111
- PDS = 104
- PDS = 105
- PDS = 350
- PDS = 365
- PDS = 366
- PDS = 367
- PDS = 270
Soprema may modify the composition and/or utilization of its product without prior notice. Consequently, orders will be filled according to the latest specifications.

Section 4 - System Selection

25A = Elastophene Sanded 3.0 - ASTM D 6163, Type 1, Grade S  
PDS = 271
25B = Elastophene Sanded FR - ASTM D 6163, Type 1, Grade S  
PDS = 272
26 = Elastophene HR 2.2 - ASTM D 6163, Type 2, Grade S  
PDS = 305
27 = Elastophene HR 3.0 - ASTM D 6163, Type 2, Grade S  
PDS = 306
28 = Sopralene 350 Sanded* - ASTM D 6164, Type 2, Grade S  
PDS = 368
29 = Elastophene HD - ASTM D 6163, Type 1, Grade S  
PDS = 275
37 = Elastophene HP - ASTM D 5147  
PDS = 245
38 = Elastophene HS FR - ASTM 6162, Type 3, Grades S  
PDS = 250
40B = Elastophene HR FR - ASTM D 6163, Type 2, Grade S  
PDS = 308

* Although permitted, these base membranes are not recommended for cold adhesive designs.

E. Base Membranes For Hot Asphalt or Cold Adhesive Applied Base and Heat Welded Cap Membrane Systems:

23 = Elastophene PS 2.2 - ASTM D 6163, Type 1, Grade S  
PDS = 300
23A = Elastophene PS 3.0 - ASTM D 6163, Type 1, Grade S  
PDS = 301
24 = Elastophene 180 PS - ASTM D 6164, Type 1, Grade S  
PDS = 351
35 = Sopralene 350 PS* - ASTM D 6164, Type 2, Grade S  
PDS = 369

* Although permitted, this base membrane is not recommended for cold adhesive designs.

F. Base Membranes For Heat Welded Base Membrane and Heat Welded Cap Membrane Systems:

05B = Soprabase TG - ASTM D 5147  
PDS = 112
26A = Elastophene Flam HR - ASTM D 6163, Type 2, Grade S  
PDS = 315
27A = Elastophene Flam HR 3.0 - ASTM D 6163, Type 2, Grade S  
PDS = 316
40C = Elastophene Flam HR FR - ASTM D 6163, Type 2, Grade S  
PDS = 318
30 = Elastophene Flam - ASTM D 6163, Type 1, Grade S  
PDS = 280
30A = Elastophene Flam 2.2 - ASTM D 6163, Type 1, Grade S  
PDS = 281
30B = Elastophene Flam 2.5 - ASTM D 6163, Type 1, Grade S  
PDS = 282
31 = Sopralene Flam 250 - ASTM D 6164, Type 2, Grade S  
PDS = 355
31A = Sopralene Flam 250 3.5 mm - ASTM D 6164, Type 2, Grade S  
PDS = 356
32 = Sopralene Flam 180 - ASTM D 6164, Type 1, Grade S  
PDS = 357
32B = Sopralene Flam 180 2.7 mm - ASTM D 6164, Type 1, Grade S  
PDS = 358
36 = Sopralene Flam 350 - ASTM D 6164, Type 2, Grade S  
PDS = 425
37A = Elastophene Flam HP - ASTM D 5147  
PDS = 246
38A = Elastophene Flam HS FR - ASTM D 6162, Type 3, Grade S  
PDS = 251
40C = Elastophene Flam HR FR - ASTM D 6163, Type 2, Grade S  
PDS = 318

G. Base Membranes For Heat Welded Base Membrane and Self-Adhered, Hot Asphalt Or Cold Adhesive Cap Membrane Systems:

23B = Elastophene SP 2.2 - ASTM D 6163, Type 1, Grade S  
PDS = 302
23C = Elastophene SP 3.0 - ASTM D 6163, Type 1, Grade S  
PDS = 303

H. Base Membranes For Mechanically Fastened Base Membrane and Heat Welded Cap Membrane Systems:

05A - Soprabase S - ASTM D 5147  
PDS = 111
23A = Elastophene PS 3.0*** - ASTM D 6163, Type 1, Grade S  
PDS = 301
31S = Soprafix [X] - ASTM D 6164, Type 2, Grade S (6" heat welded side lap)  
PDS = 415
31T = Soprafix [X] 3.5 - ASTM D 6164, Type 2, Grade S (6" heat welded side lap)  
PDS = 416

Soprema may modify the composition and/or utilization of its product without prior notice. Consequently, orders will be filled according to the latest specifications.
Section 4 - System Selection

32F = Soprafix (F) - ASTM D 6164, Type 1, Grade S (5” heat welded side lap*) PDS = 408
32S = Soprafix (S) - ASTM D 6164, Type 1, Grade S (4” heat welded side lap**) PDS = 409
32P = Soprafix - ASTM D 6164, Type 1, Grade S (4” heat welded side lap***) PDS = 405
30 = Elastophene Flam*** - ASTM D 6163, Type 1, Grade S PDS = 280
30B = Elastophene Flam 2.5*** - ASTM D 6163, Type 1, Grade S PDS = 282
72 = Sopra 4897 - ASTM D 4897 PDS = 114
* Side lap areas are covered with plastic burn-off film.
** Four inch side lap is used for batten bar.
*** These base membranes are limited with regard to wind resistance. Contact the Soprema Technical Department for more information.

I. Base Membranes For Mechanically Fastened Base Membrane and Self-Adhered Or Cold Applied Cap Membrane Systems:

05A - Soprabase S - ASTM D 5147 PDS = 111
32S = Soprafix (S) - ASTM D 6164, Type 1, Grade S (4” or 5” heat welded side lap*) PDS = 409
32E = Soprafix-e - ASTM D 6164, Type 1, Grade S (4” or 5” self-adhered side lap***) PDS = 406
32FR = Soprafix-e FR - ASTM D 6164, Type 1, Grade S (4” or 5” self-adh. side lap***) PDS = 407
32P = Soprafix - ASTM D 6164, Type 1, Grade S (4” heat welded side lap**) PDS = 405
23C = Elastophene SP 3.0 - ASTM D 6163, Type 1, Grade S PDS = 303
* Side lap areas are covered with plastic burn-off film.
** Four inch side lap is used for batten bar.
*** Typically used over polystyrene but not with Tri-Fixx System.

Soprafix-e and Soprafix-e FR - No side lap lay lines are added since the sanded top surface delineates where the five inch side lap area begins.
#14 or #15 fasteners required for all Soprafix systems.

J. Base Membranes For Self-Adhered Applied Base and Heat Welded Cap Membrane Systems:

33 = Sopralene Flam Stick - ASTM D 5147 PDS = 400
33B = EPS Flam Stick - ASTM D 6163, Type 2, Grade S PDS = 255

K. Base Membranes For Self-Adhered Applied Base and Cold Adhesive, Self-Adhered, Or Ribbon Stripped Cap Membrane Systems:

33A = Sopralene Stick - ASTM D 6164, Type 1, Grade S PDS = 401

L. Base Membranes For Heat Welded Applied Base and Cold Adhesive, Self-Adhered, Or Ribbon Stripped Cap Membrane Systems:

34 = Sopralene 180 SP 3.5 mm - ASTM D 6164, Type 1, Grade S PDS = 359
34A = Sopralene 180 SP 3.0 mm - ASTM D 6164, Type 1, Grade S PDS = 360

M. Base Membranes For Ribbon Self-Adhered Applied Base and Cold Adhesive Or Self-Adhered Cap Membrane Systems:

77 = Sopra ESHAvant - ASTM D 5147 PDS = 113
79 = Colvent SA - ASTM D 6163, Type 1, Grade S PDS = 291
79A = Colvent 180 SA - ASTM D 6164, Type 1, Grade S PDS = 293

N. Base Membranes For Ribbon Self-Adhered Applied Base and Heat Welded Cap Membrane Systems:

79B = Colvent Flam SA - ASTM D 6163, Type 1, Grade S PDS = 295
**Section 4 - System Selection**

Soprema may modify the composition and/or utilization of its product without prior notice. Consequently, orders will be filled according to the latest specifications.

### O. Base Membranes For Ribbon Heat Welded Applied Base and Cold Adhesive Or Self-Adhered Cap Membrane Systems:

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
<th>ASTM Specification</th>
<th>Grade</th>
<th>PDS</th>
</tr>
</thead>
<tbody>
<tr>
<td>79C</td>
<td>Colvent Flam 180 SA</td>
<td>D 6164, Type 1, Grade S</td>
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<td>297</td>
</tr>
<tr>
<td>78</td>
<td>Colvent TG</td>
<td>D 6163, Type 1, Grade S</td>
<td></td>
<td>290</td>
</tr>
<tr>
<td>78A</td>
<td>Colvent 180 TG</td>
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### P. Base Membranes For Ribbon Heat Welded Applied Base and Heat Welded Cap Membrane Systems:

<table>
<thead>
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<th>Description</th>
<th>ASTM Specification</th>
<th>Grade</th>
<th>PDS</th>
</tr>
</thead>
<tbody>
<tr>
<td>78B</td>
<td>Colvent Flam TG</td>
<td>D 6163, Type 1, Grade S</td>
<td></td>
<td>294</td>
</tr>
<tr>
<td>78C</td>
<td>Colvent Flam 180 TG</td>
<td>D 6164, Type 1, Grade S</td>
<td></td>
<td>296</td>
</tr>
</tbody>
</table>

### Q. Cap Membranes For Hot Asphalt Or Cold Adhesive Cap Membrane Systems:

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
<th>ASTM Specification</th>
<th>Grade</th>
<th>PDS</th>
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<tbody>
<tr>
<td>37B</td>
<td>Elastophene HP FR GR</td>
<td>D 5147</td>
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<td>247</td>
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<tr>
<td>38B</td>
<td>Elastophene HS FR GR</td>
<td>D 6162, Type 3, Grade G</td>
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<td>252</td>
</tr>
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<td>40</td>
<td>Elastophene HR FR GR</td>
<td>D 6163, Type 2, Grade G</td>
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</tr>
<tr>
<td>40D</td>
<td>Elastophene HR GR</td>
<td>D 6163, Type 2, Grade G</td>
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<td>41</td>
<td>Elastophene GR</td>
<td>D 6163, Type 1, Grade G</td>
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<tr>
<td>41</td>
<td>Elastophene LS FR GR</td>
<td>D 6163, Type 1, Grade G</td>
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<td>273</td>
</tr>
<tr>
<td>42</td>
<td>Elastophene Flam FR GR</td>
<td>D 6163, Type 1, Grade G</td>
<td></td>
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</tr>
<tr>
<td>43</td>
<td>Sopralene 180 GR</td>
<td>D 6164, Type 1, Grade G</td>
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<td>375</td>
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<td>44</td>
<td>Sopralene 180 FR GR</td>
<td>D 6164, Type 1, Grade G</td>
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<tr>
<td>44A</td>
<td>Sopralene 180 FR 3.5</td>
<td>D 6164, Type 1, Grade G</td>
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<td>45</td>
<td>Sopralene 250 GR*</td>
<td>D 6164, Type 2, Grade G</td>
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<tr>
<td>46</td>
<td>Sopralene 350 GR*</td>
<td>D 6164, Type 2, Grade G</td>
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<tr>
<td>47</td>
<td>Sopralene 250 FR GR*</td>
<td>D 6164, Type 2, Grade G</td>
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<td>381</td>
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<tr>
<td>55A</td>
<td>Elastophene FR+ GR</td>
<td>D 6163, Type 1, Grade G</td>
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<td>345</td>
</tr>
</tbody>
</table>

* Although permitted, these cap membranes are not recommended for cold adhesive designs.

### R. Cap Membranes For Heat Welded Cap Membrane Systems:

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
<th>ASTM Specification</th>
<th>Grade</th>
<th>PDS</th>
</tr>
</thead>
<tbody>
<tr>
<td>37C</td>
<td>Elastophene Flam HP FR GR</td>
<td>D 5147</td>
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<td>248</td>
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<tr>
<td>38C</td>
<td>Elastophene Flam HS FR GR</td>
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<td>40A</td>
<td>Elastophene Flam HR FR GR</td>
<td>D 6163, Type II, Grade G</td>
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<tr>
<td>40E</td>
<td>Elastophene Flam HR GR</td>
<td>D 6163, Type II, Grade G</td>
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<td>48</td>
<td>Sopralene Flam 180 FR GR</td>
<td>D 6164, Type 1, Grade G</td>
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<td>385</td>
</tr>
<tr>
<td>48A</td>
<td>Sopralene Flam 180 FR 3.5</td>
<td>D 6164, Type 1, Grade G</td>
<td></td>
<td>386</td>
</tr>
<tr>
<td>48B</td>
<td>Sopralene Flam 180 FR+ GR</td>
<td>D 6164, Type 1, Grade G</td>
<td></td>
<td>395</td>
</tr>
<tr>
<td>49</td>
<td>Sopralene Flam 350 FR GR</td>
<td>D 6164, Type 2, Grade G</td>
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<tr>
<td>49B</td>
<td>Sopralene Flam 350 FR+ GR</td>
<td>D 6164, Type 2, Grade G</td>
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<td>Sopralene Flam 180 GR</td>
<td>D 6164, Type 1, Grade G</td>
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<td>50A</td>
<td>Sopralene Flam 180 GR 3.5</td>
<td>D 6164, Type 1, Grade G</td>
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<td>51</td>
<td>Sopralene Flam 250 GR</td>
<td>D 6164, Type 2, Grade G</td>
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<td>52</td>
<td>Sopralene Mammoth GR</td>
<td>D 6164, Type 2, Grade G</td>
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<tr>
<td>53</td>
<td>Elastophene Flam GR</td>
<td>D 6163, Type 1, Grade G</td>
<td></td>
<td>285</td>
</tr>
<tr>
<td>53</td>
<td>Elastophene Flam LS FR GR</td>
<td>D 6163, Type 1, Grade G</td>
<td></td>
<td>283</td>
</tr>
<tr>
<td>54</td>
<td>Sopralene Flam 250 FR GR</td>
<td>D 6164, Type 2, Grade G</td>
<td></td>
<td>390</td>
</tr>
<tr>
<td>54B</td>
<td>Sopralene Flam 250 FR+ GR</td>
<td>D 6164, Type 2, Grade G</td>
<td></td>
<td>396</td>
</tr>
<tr>
<td>55</td>
<td>Elastophene Flam FR GR</td>
<td>D 6163, Type 1, Grade G</td>
<td></td>
<td>284</td>
</tr>
</tbody>
</table>
Section 4 - System Selection

Soprema may modify the composition and/or utilization of its product without prior notice. Consequently, orders will be filled according to the latest specifications.

S. Cap Membranes For Single Ply Cap Membrane Systems:

56 = Unilay - ASTM D 6164, Type 2, Grade G  PDS = 435
56A = Unilay-e - ASTM D 6164, Type 1, Grade G  PDS = 436
56B = Unilay 180 - ASTM D 6164, Type 1, Grade G  PDS = 437

T. Cap Membranes For Self-Adhered Cap Membrane Systems:

74 = Colphene HR GR - ASTM D 6163, Type 1, Grade G  PDS = 326
76 = Colphene HR FR GR - ASTM D 6163, Type II, Grade G  PDS = 328
93 = Soprastar Stick - ASTM D 5147  PDS = 421

U. Cap Membranes For Self-Adhered Venting Granular Membranes:

90 = Colvent SA GR - ASTM D 6164, Type 1, Grade G  PDS = 235

V. Cap Membranes For Heat Welded Venting Granular Membranes:

91 = Colvent TG GR - ASTM D 6164, Type 1, Grade G  PDS = 236

4.02 - System Design

A. The following are examples of using the above abbreviations and numbers to specify a selected design either in a project specification or the Soprema Project Registration Form.

IS-20/44-A - This is an insulated steel deck hot mopped system with a Elastophene 180 Sanded base membrane and a Sopralene 180 FR GR cap membrane. The flashing system is designated separately and could be the same as the roof system in this example (i.e. F-20/44-A).

IS-32/50-MH - This is an insulated steel deck mechanically fastened system with a Soprafix base membrane and a Sopralene Flam 180 FR GR cap membrane. The flashing system is designated separately and could in this example could be F-32/50-H. This flashing system would be Sopralene Flam 180 heat welded base membrane covered by a Sopralene Flam 180 GR cap membrane.

End of Section