

## Section 07 54 19 MF

# True Seal Polyvinyl-Chloride (PVC) Mechanically Fastened Roofing System

## Introduction

This Section 07 54 19 MF True Seal Polyvinyl-Chloride (PVC) Mechanically Fastened Roofing System document is intended to be used as a guideline specification. Any changes to this document as a part of a bid package submission, or any other presentation, are prohibited unless accompanied by a written directive from the True Seal Technical Department.

## Part 1 GENERAL

### 1.01 Description:

A. The True Seal (TS) Mechanically Fastened Roofing System utilizes True Seal PVC roofing membranes in various thicknesses (50, 60, and 80) and custom thicknesses. These membranes are available in different widths and in White, Cool Tan, Tan, Brown, Gray, and custom colors. All True Seal mechanically fastened roofing membranes are fastened to acceptable structural deck within the roofing system. According to the specific application, location, and regulations, different product options are used in the mechanical fastening of the membrane. All True Seal PVC membrane options are overlapped to a specific dimension and sealed with a heat weld and all penetrations are detailed using various forms of True Seal accessory products such as (but not limited to) pre-molded PVC corners and cones, termination bars, various conduit flashings, drains and scuppers and all according to True Seal standard flashing details.

B. Related work of this section is as follows and is not limited to:

1. Removal of existing roofing membrane system and flashings

2. Wood Blocking and Carpentry
3. Vapor Retarders
4. Insulation
5. Membrane
6. Membrane Flashing
7. Metal Flashing
8. Walkways
9. Specialty Products
10. Caulking and Sealants

#### 1.02 [Quality Assurance:](#)

A. True Seal publishes specifications, installation details and guidelines to meet or exceed True Seal system requirements for warranty issuance and long-term performance. True Seal also publishes guidelines and advisories with respect to code and standards in the construction and insurance industry within these specification documents. These code and standards publications (or local legislated directives about code and standards) should take precedence in all manners and should in all respects exceed the requirements of True Seal. Where there is conflict between True Seal published specifications, installation details and guidelines and legislated codes and standards, please contact True Seal for guidance in these manners before installations are underway. It is the responsibility of the specifier or owners specifying agent to ensure the correct codes and standards are identified for the specific project.

B. True Seal recommends the use of only True Seal branded products and accessories within the roofing system, or pre-approved products or substitutes. All other products that are not approved or pre-approved substitutes are not the responsibility of True Seal and may void any True Seal warranty. Pre-approval for deviations is only confirmed in writing and verbal approvals are not binding in any case.

C. True Seal roofing systems should only be installed by True Seal Authorized Contractors who are registered and certified with their own specific True Seal Contractor Number. True Seal shall not be responsible for any work done by non-Authorized Contractors and warranties will not be issued as such. True Seal Authorized Contractors are responsible for following all current True Seal published specifications and installation details and directives.

D. True Seal Authorized Contractors must fill in a True Seal Job Form prior to the start of a job. True Seal will review this form and confirm back notification of the acceptable installation procedures to the Authorized Contractor as per the information reported on the form. Errors and omissions from the Authorized Contractors about any project details that may change the notification are not the responsibility of True Seal.

E. Deviations from True Seal specifications or True Seal details are not permitted without written approval. This approval must be completed before the project installation has been initiated. The True Seal Deviation Form is the only acceptable form to initiate this approval.

F. Upon completion of the project, True Seal may perform an on-site review(s) to verify the installation with respect to the True Seal specifications, details, installed materials, Job Notification form and warranty requirements. True Seal reserves the right to reject any project or warranty issuance based on the grounds that the installation does not meet the requirements of 1.02 A of this section, or other reasons deemed relevant to the work process outlined in this section.

### 1.03 Product Delivery, Handling and Storage:

A. All job site deliveries from either True Seal direct or from the contractor shall be done in accordance with local regulations relating to safety, accessibility, local by-laws, permits and schedules. It is the responsibility of the installing contractor to coordinate these measures with the General Contractor, Owner, or noted agents of the same to ensure compliance. True Seal and carriers hired by True Seal shall not bear the cost of any of these measures including permits and penalties. True Seal hired carriers in turn must follow safety and transportation requirements in all jurisdictions and with respect to all federal and local regulations.

B. All True Seal materials (conveyed to site directly from a third party carrier, or from the Roofing contractors existing inventory) must be in their original packaging. All True Seal materials must be labelled with the True Seal name and original labelling. This labelling would include any True Seal material identification and dates of manufacture, and expiration dates where they might apply.

C. All materials must be stored in a safe space with respect to structural loading of the roof deck or storage areas. It is the responsibility of the installing contractor to ensure that these safe load practices are undertaken and True Seal is not responsible for any claims made with respect to damages relating to this issue.

D. All materials must be stored in a clean and dry environment protected from the elements. No products should ever be stored in ponding water areas, and vented tarps should be used to protect the materials and product labels from the elements. All adhesives and caulking and liquid products must be stored between 50 and 80 degrees F (10 and 25 degrees)

E. Caution must be taken as well to ensure that products that are affected by freezing are kept in warm safe location at all times.

F. All flammable and explosive materials identified as such with product labels must be stored in a safe and dry area. This secure storage area must be away from open flames, sparks, ignition devices, or any other entities deemed in conflict to the safe storage of these identified products. Please follow the packaging regulations for guidelines and advisories as well as any local or Federal requirements with respect to all handling instructions.

#### 1.04 Job Site Conditions:

A. In all matters, installations of True Seal roofing systems should only be undertaken in safe environments including but not limited to weather issues such as rain, hail, lightning, high winds and extreme temperatures, and working at heights regulations and safety guidelines. Worker safety for all individuals should always be the number one priority.

B. All installations should be over clean, dry and safe substrates, decks, existing roofing systems and workspaces. As well, all roofing components in the application should be clean and dry at the time of the application.

C. Installations of True Seal roofing systems should only be undertaken when the work plan for the day can be completed and watertight by the end of the work day or shift. This would include but not be limited to completing all seaming and detail work and making any transitions and tie-ins watertight. As well, the site must be secured at all times in all manners so that the building and contents are protected from risk, and all materials and work are secured from wind and water damage.

D. In the event that component materials get wet during unexpected rain or snow falls, these wet materials must be removed from the system and replaced with clean and dry materials.

E. In the event that “water stops” are used for temporary tie-ins and night seals, these water stops shall be completely removed from the system at the next days start up and disposed of accordingly. These water stops must not impede drainage or promote collection of water on the roof. In all cases, provisions or temporary drainage must be provided at these temporary areas to avoid all potential damages from water collection and infiltration into the roofing system. Temporary or permanent drainage must be functional, “unclogged” and sized accordingly.

F. The newly applied True Seal roofing system should not be used as a work surface or storage area for materials and equipment or walking surface for personnel (including other trades). The work sequence or plan should be arranged to consider and eliminate these conflicts.

G. The True Seal roofing system and work area should be protected at all times from chemicals and materials deemed hazardous to the system or the installers.

H. All roofing waste material (new or existing) must be removed in a safe manner from the job site each day and disposed of in strict accordance with local regulations and requirements. In all manners, this waste removal must be done in a method that roofing personnel, building occupants, pedestrians, building elements and contents are protected from risk.

I. Roofing membranes may be slippery when covered by ice, snow, frost, dew, or moisture. Care should be taken when walking on slippery roofing membranes and special precautions around roof edges and elevation changes are recommended.

J. Considerations and provisions should be made near air intake units or ventilation units to prevent odors or airborne particulates from the roofing application entering an internal work area.

#### 1.05 Submittals:

A. At any time and as required by the specifying authority, owner, consultant or party designated, the following documents and materials are available for submission for the True Seal Roofing system:

1. Applicable specifications for the roofing system
2. Application standard detail drawings
3. True Seal approved custom drawings for special on-site particulars including details and layouts
4. Samples of the component True Seal products or True Seal supplied products within the system
5. Technical Data Sheets for the applicable True Seal products
6. Code compliance documentation for True Seal products or True Seal supplied component parts
7. Sample copy of the applicable or requested True Seal warranty
8. MSDS or SDS for the True Seal component products installed on the roof
9. Certification that the installing contractor is a True Seal Authorized Contractor

10. Custom submittal documents requested and completed by the True Seal  
Technical Department

1.06 Code Requirements:

A. The True Seal Roofing system shall be installed using the printed specifications and details contained herein. Augmenting or changing the specification, details, layouts and installation techniques to accommodate compliance with building codes, standards (FM, cULus, ASTM, LEED etc) and insurance requirements will in all matters never minimize True Seal system designs, and the True Seal design shall be considered the base or minimum standard.

B. Enhanced system requirements beyond the scope of the True Seal specification shall be documented and approved as described in the "Submittals" and "Quality Assurance" sections of this specification. Written notification of the acceptance of these enhancements and the changes in the installation, layout, or details must be completed before the project installation has started.

C. Specifiers may consult with the True Seal Technical Department for compliance documentation at any time before the project documentation is completed and tendered.

1.07 Warranties:

A. Pursuant to the Terms and Conditions outlined in the True Seal warranty line-up, Membrane (Seal Guard), Material and Labor (Seal Shield) and Full System (Armoured Seal) warranties are available on True Seal roofing systems installed by True Seal Authorized Contractors.

B. Notification and approval must be completed before the project start-up as indicated in the "Quality Assurance" section of this warranty.

C. As warranty terms vary, please confirm the term is accurate before project start up. Different warranty terms (length of warranty period) may have specific and unique requirements that must be adhered to. True Seal reserves the right to modify in writing any published specifications, details, installation techniques, products or layouts on a job to job basis to meet requirements for warranty issuance.

D. Additional warranties offered by roofing contractors, roofing associations, manufacturers or others shall not alter the True Seal warranty as a stand-alone document. No implied or "documented by others" changes would be in force. If a change to a True Seal warranty were required, it would only be valid if approved, documented and authorized directly in writing from True Seal before the commencement of the project.

E. Where inspections are required for issuance of True Seal warranties, only personnel authorized by True Seal are qualified for inspection and documentation of installation standards and conformance.

End of Section

## Part 2

## PRODUCTS:

The following products are utilized in the True Seal Polyvinyl-Chloride (PVC) Mechanically Fastened Roofing System and may be integrated into the roofing system as required to meet the conditions of the specific installation. Products that are not listed in this section and not supplied by True Seal may be used if they have been approved by the True Seal Technical Department by way of a Deviation form. In general, True Seal does not warranty these products supplied by others, or True Seal Systems containing these products supplied by others, however application may be made before the installation has begun for consideration.

### 2.01 System Materials:

A. True Seal PVC polyester reinforced roofing membrane. Thickness is 50 mil (1.2 mm) to 80 mil (2.0 mm). Color as specified. The True Seal PVC membrane shall conform to the following standards:

1. ASTM D4434.04 Standard. Classification: Type III. 502. True Seal PVC: CAN/CGSB37.54-95 Standard for Polyvinyl Chloride Sheet roofing. Classification: Type 4, Class B.
2. Herringbone Walkpad Yellow - polyester reinforced, slip resistant herringbone embossed PVC walkway. 30" x 50', Thickness 156 mil (4.0 mm).
3. Self-Ballasting Heavy Duty Cross Grip Walkpad - slip resistant cross grip extra heavy duty self-ballasting PVC walkway. 36" x 33'
4. True Seal PVC Detail Membrane - non-reinforced 60 mil PVC membrane used to detail inside and outside corner flashing as well as non standard dimensioned flashings and details. Thickness 60 mil (1.5 mm). Color as specified and available.

B. #14 Drill Point Fastener - self-tapping, corrosion-resistant fasteners, buttress thread, FM Global 4470 approved for use in mechanically attaching True-Seal PVC roofing membrane into structural steel and wood decks.

1. #15 Drill Point Fastener - self-tapping, corrosion-resistant fasteners, buttress thread, FM Global 4470 approved for use in mechanically attaching True-Seal PVC roofing membrane into structural steel and wood decks.
2. #14 Concrete Fastener, carbon steel, epoxy coated, FM Global 4470 approved for fastening into structural concrete, pre-stressed concrete, and post stressed concrete deck



C. Concrete Spikes – hammer in, non-threaded fastener, FM Global 4470 approved for use in mechanically attaching True-Seal PVC roofing membrane and insulation into structural concrete decks (the concrete deck must be pre-drilled).

D. 2-3/8" Metal Membrane Plate – 2-3/8" (60 mm) round diameter galvalume metal plate FM Global 4470 approved for use in mechanically attaching the field membrane and anchoring around penetrations such as roof drains, pitch pans, stacks, etc.

E. 3" Metal Insulation Plate – 3" (75 mm) galvalume metal plate. FM Global 4470 approved for use in mechanically attaching insulation to structural deck.

F. Term Bar Metal 1" – 1" extruded aluminum bar, center punched 12" (300 mm) O.C., used as a termination bar on vertical surfaces.

G. Term Bar PVC extruded out door rated PVC bar, center punched 6" (150 mm) O.C., used as a termination bar on vertical surfaces.

H. Term Bar Butyl Tape – 1/8" thick by 3/4" x 25 ft butyl tape.

I. True Seal Low VOC Bonding Adhesive - used for adhering True-Seal PVC flashing to approved substrates. The Solvent-based adhesive shall meet the following standards when used in conjunction with True-Seal PVC membranes.

1. FM Global Standard 4470

2. UL Standard 790

J. Drain Water Cut Off Sealant- one part synthetic rubber blend used as a termination sealant between True-Seal PVC membranes and approved substrates.

K. True Seal Caulking - one part polyurethane caulking used as a sealant.

L. Pourable Sealer - two-part urethane sealant used as pitch pan filler.

M. Clad Metal PVC- 24 gauge galva-nized (G-90) sheet metal laminated with a minimum 20 mil (0.6 mm) True Seal PVC film, used where True-Seal PVC roofing membranes are to be welded directly to the metal flashing.

O. Miscellaneous fasteners and anchors – Fasteners shall be coated or treated so as to inhibit corrosion of the fastener or of the fastened materials. When miscellaneous fasteners are used on metal products, care should be taken to use similar metals with respect to the fastener and medium so as to prohibit galvanic degradation of the material and fastener. In all

matters, the fasteners and anchors must be compatible with True Seal roofing system component products

## 2.02 Related Materials (supplied by others):

### A. Wood blocking

1. Wood blocking shall be SPF #2 quality or better. Wood may be treated (wolmanized or osmose treated) however Creosote or asphaltic treated lumber is not permitted. True-Seal PVC membrane may come in contact with wolmanized or osmose treated lumber however the True Seal PVC membrane must not be not be adhered to wolmanized or osmose treated lumber.
2. Factory Mutual's Loss Prevention Data Sheet 1-49 is the reference for wood blocking.

### B. Plywood

Plywood shall be exterior grade, non-treated with a minimum thickness of ½". This thickness however should be verified for structural integrity.

### C. Vapor barriers

1. Vapor barriers for use in Mechanically Fastened roofing systems - Roof System shall meet identified building code requirements and/or insurance requirements e.g. UL/ULC, FM, ASTM, CGSB standards.
2. Vapor barriers are to be approved in writing by the vapor barrier manufacturer for their in-tended use.
3. Vapor barriers are to be compatible with all True Seal roofing system components.

### D. Insulation/ Cover Boards

1. Where specified or required, insulation/ cover boards shall be installed over the structural deck or as a separation layer over the existing substrate and/or to obtain the desired thermal value.
2. Insulations / cover boards are to be approved in writing by the insulation / cover boards manufacturer for their in-tended use and for use with True Seal PVC roofing membranes.

3. Insulation / cover boards shall be compatible with True Seal PVC roofing membranes. Consult the True Seal Technical Department for compatibility between insulations and True-Seal PVC membranes.

The following insulation boards are acceptable in the True seal Mechanically Attached Roof System.

Polyisocyanurate Insulation conforming to the following standards

ASTM C 1289, Type II, Class 1

ASTM Standards, E108 & E119

UL STANDARDS, 1256, 790, 263 & 1897

CAN/CGSB-51.26-M86

CAN/ULC Standards, S704, S126, S101 & S107

FM Global Standards, 4450 & 4470

Expanded Polystyrene (EPS) conforming to the following standards

ASTM C 578

ASTM Standards, E108 & E119

UL STANDARDS, 1256, 790

CAN/ULC Standards, S701, S126, S101 & S107

FM Global Standards, 4450 & 4470

Extruded Polystyrene (XPS) conforming to the following standards

ASTM C 578, Type IV

ASTM Standards, E108 & E119

UL STANDARDS, 1256, 790

CAN/ULC Standards, S701 Type III, S126, S101 & S107

FM Global Standards, 4450 & 4470

The following cover boards are acceptable in the True Seal Mechanically Attached Roof System

Gypsum core (water resistant) cover boards with glass mat facings front and back conforming to :

ASTM C209 Standard Test Method for Cell. Fiber Insulating Board

ASTM C472 Standard Test Methods for Physical Testing of Gypsum, Gypsum Plasters and Gypsum Concrete.

ASTM C473 Standard Test Methods for Physical Testing of Gypsum Panel Products.

ASTM C1177 Standard Specification for Glass Mat Gypsum Substrate for Use as Sheathing.

ASTM D3273 Standard Test Method for Resistance to Growth of Mold on the Surface of Interior Coatings in an Environmental Chamber.

ASTM E84 Standard Test Method for Surface Burning Characteristics of Building Materials

ASTM E96 Standard Test Methods for Water Vapor Transmission of Materials.

ASTM E108 Standard Test Methods for Fire Tests of Roof Coverings

ASTM E136 Standard Test Method for Behavior of Materials in a Vertical Tube Furnace at 750 C.

ASTM E661 Standard Test Method for Performance of Wood and Wood-Based Floor and Roof Sheathing Under Concentrated Static and Impact Loads.

Underwriters Laboratories (UL): UL 790 Standard Test Methods for Fire Tests of Roof Coverings.

End of Section

## Part 3 EXECUTION

### 3.01 General:

In all matters, the roof area undertaken whether in new roofing, re-cover, or re-roofing shall be complete at the end of each roofing period, generally defined as the end of each working day, however this period may be a shorter segment of the accepted working day. This includes all seaming of the membrane and flashings and details and the condition of the work must be watertight

### 3.02 Deck Conditions/Preparation:

A. At all times, the roof deck must be an integral part of the structural system of the building and be adequate in all loading as prescribed by general conditions of the practice of structural engineering. The roof deck must be able to provide the loading support of all loads and potential loads including but not limited to live, dead, stability, deflection, safety, snow loading as well as for the True Seal roofing system with the appropriate safety factors as governed by the general conditions of the practice of structural engineering and jurisdictional building codes.

B. In all matters, structural decking that shows any signs of rust or damage must be corrected and approved by the appropriate governing body to assume the integrity of the system. True Seal shall not be held responsible for legal or punitive costs for assessing or correcting or approving structural decking that does not meet the loading and safety factors that are required for the structural integrity of the True Seal roofing system. True Seal and True Seal employees will not make any notations and not be responsible for any notations about the structural integrity of the deck or structural system.

C. With respect to wind loading, the roof deck shall be installed as per structural framing guidelines, codes and building codes. FM Global requirements are used as the baseline for wind uplift calculations and resistance guidelines for the specific roofing system in the jurisdiction of its installation.

D. Pull out tests must be performed for re-roof or re-cover projects. Pull out tests must also be performed on any new lightweight roof deck assemblies. The roofing contractor or a qualified owner's representative are tasked with the pull out testing and are responsible for its accuracy and integrity according to the ANSI/SPRI FX-1 Standard (current edition). These tests must be reported and signed off as performed to these standards and presented to True Seal for documentation. The following is a guideline for the number of pull out requirements:

1. Projects up to 50,000 sqft. must have a minimum of 10 pull-out tests

2. Projects greater than 50,000 sqft. will have pull out tests at a rate of 1 pull-out test per 5,000 sqft.
3. In all matters the perimeter and corner zones (as defined by FM 1-28 Loss Prevention Data Guideline) will receive 60% of the pull-out test and the remaining 40% shall be in the field area (as defined by FM 1-28 Loss prevention Data Guideline)

E. The roof shall only be loaded following the provisions of 1.03 (C) contained in this document

F. Please contact the True Seal Technical Department when the building use of activities within do or could create environments that are detrimental to metal, or promote metal fatigue such as dynamic loading and excessive deflections.

G. Please contact the True Seal Technical Department when the building use of activities within do or could create environments such as high humidity, temperature, or chemically corrosive contact with the structural, structural decking or True Seal Roofing System.

H. The following deck substrates are acceptable for the installation of the True Seal PVC roofing membrane system:

1. Concrete, pre-stressed concrete, post-stressed concrete, and light weight concrete decks. The decks must be in all matters structurally sound and when a True Seal membrane is in direct contact with the deck, the finish must be "trowel finish".
2. Plywood or structural wood decks. The thickness of the plywood or structural wood deck is dictated by the structural integrity of the supporting structure and span and by the required pull out values required by True seal Technical Department. The securement of the plywood or structural wood deck to the underlying structure must be adequate to withstand all structural loading including pull-out values as they transfer to the structural deck. When a True Seal membrane is in direct contact with the deck, the finish must be "Good one side" finish.
3. Metal deck anchored as per SMACNA requirements. The securement of the metal to the underlying structure must be adequate to withstand all structural loading including pull-out values as they transfer to the structural deck

### 3.03 Substrate Preparations with Removal (Tear-off) of Existing Roof System:

A. In all matters, the decking must be clean of all debris and dry. As well, the deck must be free of all chemicals and any amendments or alterations that have been added to the original deck unless they are integral to the performance of the mechanical services and supported in definition as part of the buildings utilities.

B. In all matters, the decking must be structurally sound as determined by the applicable jurisdiction and FM Global, and for the purposes of supporting the True Seal Roofing system and structural loading elements as outlined in this document under section 3.02

C. The existing roofing system shall be removed from the structural deck and disposed of in a safe manner. Care should be taken not to overload the existing roofing system and structural system during the transportation of the existing tear-off roofing system. No elements of the existing system are to remain unless there are provisions in the specification or project documentation.

D. The existing roofing system also includes removing deteriorated wood blocking and related metal flashings that are to be replaced as per the specification or project documentation.

E. Deteriorated wood blocking that has been removed shall be as necessary and as described in the specification or project documentation.

F. No removed materials shall be stored on the roof or at the job site but removed and disposed of in a registered "Refuse" site.

### 3.04 Substrate Preparations without Removal (Re-Cover) of Existing Roof System:

A. The existing roof assembly and surface in all matters must be dry (moisture free).

B. The existing roof assembly in all matters must be structurally capable of acting as a substrate for the new True Seal fully Mechanically Fastened roofing system and is suitable for the installation of a retrofitted roof system that utilizes the Mechanically Fastened Roof System. It is the responsibility of the Roofing Contractor to ensure the roof system is acceptable in these measures for a retrofit application. If other authorized entities are employed to determine the condition of the roofing system as applicable in this matter, the Roofing Contractor shall verify and relay this information to the True Seal Technical department.

C. The existing roof system shall be smooth with no ridges fins or contaminants.

D. The roofing contractor and professional roof designer shall ensure that the new roofing system does not locate the dew point placement within the new roof assembly including the retrofit True Seal Mechanically Fastened roofing system. If other authorized entities are employed to determine the dew point calculation of the new roof assembly including the retrofit True Seal Mechanically Fastened roofing system, the Roofing Contractor shall verify and relay this information to the True Seal Technical department.

E. The buildings existing structural design and the structural deck in all matters must be capable of handling the added loading of the new Mechanically Fastened roofing assembly. This would include all assessments of current loading engineering calculations according to the local building code standards.

F. Methods to determine the moisture content within the existing roofing system shall be reported by the Roofing Contractor. These methods may include scans, core test, and other industry accepted test protocols, however the verification of the presence of moisture is the responsibility of the roofing contractor.

G. If portions of the roof are to be removed and replaced as specified, the removal, storage and disposal guidelines contained in section 3.03 of this specification must be adhered to.

H. Existing loose aggregate and membrane irregularities are to be removed from the roof surface before a retro-fit assembly shall be undertaken. Various methods such as power-brooming or vacuuming may be employed for this task. Care must be taken to only remove the loose aggregate and membrane irregularities in the areas that are to be completed in the projects schedule for that period so as to not damage the remaining roofing membrane during this removal and put the buildings personnel, contents or system at risk. The removal, storage and disposal guidelines contained in section 3.03 of this specification must be adhered to with respect to this removal of the loose aggregate and membrane irregularities.

### 3.05 Wood Blocking Installation:

A. If wood blocking is required in any True Seal roofing installation, the blocking shall be affixed to withstand a minimum force as outlined by FM Global. Fastening of the blocking shall be at a maximum of 24" (600 mm) on center and not less than 6" (150) mm from any end joint or blocking termination. In all matters, the fastener installation will conform to Factory Mutual Loss Prevention Data Sheet 1-49.

B. The depth of the wood blocking shall meet the thickness of the insulation at perimeter edges or as dictated by the project documents and details

C. Creosote treatments or nailers treated with asphalt-based coatings or saturates are not acceptable.



### 3.06 Vapor retarder Installation (where specified):

A. The requirement of a vapor barrier is the responsibility of the roofing contractor or design professional based on the climate and location of the building, local codes and standards, and the relative conditions within the building such as but not limited to ambient temperature, relative humidity, and positive or negative internal pressures.

B. The installation of the vapor barrier shall conform to the vapor barriers manufacturer's current published instructions. The installation of the vapor barrier in all matters meets or exceeds the requirements of True Seal with respect to its compatibility, application and performance within the roofing system.

C. Please consult the True seal Technical Department for vapor barrier approvals with respect to compatibility, application and performance within the roofing system.

### 3.07 Insulation Installation:

A. Insulation shall be installed according to the insulation manufacturer's current published specifications for use with a mechanically fastened roof system. The insulation may be mechanically fastened, adhesive adhered, or adhered in hot asphalt following the prescribed methods of attachment contained herein. When the insulation is attached with the preceding 3 methods, special consideration shall be given to the potentially increased fastening of the insulation in the perimeter and corner zones. These considerations are from True Seal's testing results and from FM published fastening patterns and rates. Please contact the True seal Technical Department for guidance with respect to these fastening patterns and fastening pattern enhancements

B. Insulation shall be installed over the acceptable substrate and perpendicular to the steel deck flutes when over structural steel decking. Insulation must be butted together with no gaps greater than ¼" gaps. Insulation ends must be supported on the high flute when installed over steel deck. When multiple layers of insulation are specified or installed, both longitudinal and end joints must be staggered between the layers by at least 12" and optimally by 24" in both planes.

C. EPS (Expanded Polystyrene) and XPS (Expanded Polystyrene) insulations must have a separation from the True Seal PVC. This separation sheet may be in the form of slip sheet, or cover board.

D. True Seal provided True Fold insulation is an acceptable substrate to be installed without a cover board under the membrane.

E. The approved separation sheet or cover board shall be installed over the insulation with joints staggered from the underlying insulation. The entire base insulation and cover board are to be attached as noted below.

F. Mechanical Attachment Installation of Insulation.

1. FM Global Standard 4470 is the corrosion and wind uplift standard for the True Seal fasteners and True Seal insulation plates.
2. Only approved substrate recognized by the FM Global Approval Guide shall be acceptable.
3. The placement of the True Seal fastener and True Seal insulation plates shall be as per FM Global fastening patterns.
4. All insulation shall be a maximum of 4 ft x 8 ft (1.2 m x 2.4 m) in size.
5. The fasteners shall be penetrate into or through the structural decking in all matters as follows:
  - a. Steel deck penetrating through with a minimum of 1/2" (13 mm) protruding from below.
  - b. Plywood deck penetrating through with a minimum of 1/2" (13 mm) protruding from below.
  - c. Structural, precast or pre-stressed concrete decks penetrating a minimum of 1" (25 mm).
  - d. Wood plank deck penetrating a minimum of 1" (25 mm).
6. Perimeter and corner enhancements of the mechanical attachment of the insulation may be required. Please contact the True seal Technical Department for clarification

G. Hot Asphalt Attachment.

1. Only Polyisocyanurate Insulation or approved cover boards and approved cover boards may be attached with hot asphalt. The insulation shall be installed according to FM Global, and the insulation manufacturer's current printed specifications.
2. Only approved decks and substrates recognized by the FM Global Approval Guide shall be acceptable.
3. Polyisocyanurate Insulation shall never be greater than 4 ft x 4 ft (1.2 m x 1.2 m) in dimension even when a cover board is installed.

4. Polyisocyanurate Insulation shall be fully mopped into the prepared structural deck or substrate with no voids or dry pockets. Type III asphalt is to be utilized following the asphalt manufacturers current printed instructions for installation of Polyisocyanurate insulation in full asphalt mopping. At a minimum, the rate of application shall be 25 – 30 lbs. per 100 sqft. (1.2 to 1.5 kg / m<sup>2</sup>).
5. The top surface of the Polyisocyanurate shall be free of all asphalt and asphalt related contaminants.
6. Please consult the True Seal Technical Department for approved cover boards and cover board attachment options when applied over Polyisocyanurate insulations applied with the Hot Asphalt Attachment method.

#### H. Adhesive Attachment

1. The insulation shall be installed according to FM Global, and the insulation manufacturers and insulation adhesive manufacturer's current printed specifications.
2. Only approved decks and substrates recognized by the FM Global Approval Guide shall be acceptable.
3. Insulation shall never be greater than 4 ft x 8 ft (1.2 m x 1.2 m) in dimension.
4. Consult the True Seal Technical Department for product specific and project specific requirements when adhesive attachment method is to be utilized.

### 3.08 True Seal PVC Roofing Membrane Installation:

A. In all matters, the approved insulation or approved substrate shall be free of all dirt, debris, chemical contaminations and installed in accordance with section 3.07 of this specification. All fasteners and plates shall be installed according to section 3.07 of this specification and to the correct depth with no protruding or "standing proud" fasteners or plates. It is the responsibility of the Roofing Contractor to replace any unsuitable insulation or insulation installations and make good to receive the True Seal PVC membrane.

B. The membrane placement should be (when permitted) started at the low point of the roof to allow for shingling of the membrane during the installation. Care should be taken during alignment to allow for roof interruptions such as RTU's, vents, curbs, drains etc. which should be "cut around" to allow the sheet to lay flat in preparation for the mechanical fastening.

C. Perimeter zones and corner zones must be analyzed and defined for appropriate enhancements of the fastening patterns and layouts.

D. The spacing (density) of True Seal fasteners and True Seal plates within the seam parallel to the seam edge is dictated by established fastening patterns from tested assemblies and reported and /or augmented to parallel the site conditions for the specific application. As well, these established fastening patterns dictate enhancement guidelines where required. Please contact the True Seal Technical Department with respect to these fastening patterns and fastening pattern enhancements

E. Generally, the 2-3/8" metal membrane plates are positioned on the outside edge of the bottom sheet so that the metal membrane plates are covering the membrane 100% and no overlap onto the substrate or insulation.

F. Fastening of the metal membrane plate with True Seal approved fasteners shall be as outlined in section 3.7 (F) E of this specification. Care must be taken to not overdrive the fastener and cause upward membrane cupping which could impede seaming technique. Care should also be used to not underdrive the fasteners causing them to "stand proud" and also impede the seaming technique.

### 3.09 Welding of Seams:

A. General.

1. All Seam areas are to be dry before hot air welding commences.
2. All Seam areas are to remain dry, clean and free of debris and contaminants while hot air welding progresses.
3. All Seam areas are to thermally fused (hot-air welded) and no other method of seaming is permitted.
4. All seam areas are to thermally fused (hot-air welded) with roofing equipment expressly designed for that purpose and no other "hot air welding" apparatuses are accepted

B. Hand Welding:

- i. Warm up hot-air hand welding equipment as recommended by the equipment manufacturer. Welding temperatures (settings) are interdependent with welding speeds, angles of attack, plane angles, ambient temperatures, membrane thicknesses and other factors.

2. Position True Seal PVC membrane in place with 6" seam joint overlaps and 3" end overlaps.
3. "Tack" welds are acceptable on detail welding but must not be used on hand welded field seams.
4. Pre-weld the back edge (back -weld, dam-weld, air dam) to prevent heat loss while performing final weld. The pre-weld back edge should be approximately 1.5-2" (25 mm to 38 mm.) in from the outside edge of the seam allowing for a minimum 1.5" final weld. The pre-weld back edge must be performed on all hand welded hot air welded field seams and details without exception.
5. The final weld of approximately 1.0" to 1.5" (25 mm to 38 mm.) wide is completed with no voids, burns, lifts or fish mouths. Care must be taken to ensure a complete weld with no burns or overheating. Please refer to the section 3.9 D of this specification for quality control assurances and tests.

C. Automatic (Machine) Welding:

1. Warm up hot-air automatic welding equipment as recommended by the equipment manufacturer. Welding temperatures (settings) are interdependent with welding speeds, ambient temperatures, membrane thicknesses and other factors.
2. Position True Seal PVC membrane in place with 6" seam joint overlaps and 3" end joint overlaps.
3. "Tack" welds must not be used on automatic welding equipment welded field seams.
4. Automatic welding equipment must be used in accordance with the manufacturer's instructions. Particular attention must be given to regular cleaning of the nozzle to prevent build-up of residue.

D. Quality control of seams.

1. It is normal for minor smoke to be emitted during the welding process. As well the membrane surface in the weld area may develop a shiny complexion. It is also a requirement of a proper seam to exhibit a "blead-out" of the liquid hot membrane which will collect and cool at the seam profile. It is important to make adjustments to the equipment and welding profiles to ensure that all these factors are present in the undertaking of the welding of the membrane.
2. It is a requirement of the roofing contractor to check (probe) all completed hot-air welded seams after cooling for seam integrity. All voids and deficiencies are

to be repaired by the end of each work period according to the True Seal Applicator Field Guide.

3. It is a requirement of the roofing contractor to check three times daily the seam integrity with destructive shear testing. A 2" (50 mm) wide by 6" (150 mm) long cross-sectional sample shall be taken three times a day (minimum) with one sample taken at the start of the work period. The samples shall be broken in shear to expose the inside of the seam and failure at the junction plane of the membrane and membrane scrim. Adjustments must be made to ensure this plane of failure is consistent and even throughout the test sample. The contractor must label and keep the two pieces of the tested seam for verification at a later date. The seam sample test area cut from the membrane field seam is to be repaired with the same installed field membrane at the cost of the contractor.

### 3.10 Perimeter Securement:

A. It is the requirement of all True Seal Mechanically Fastened roofing systems to have mechanical perimeter securement at all perimeters, elevation changes, curbs, units, drains, cones and interruption details on the installed roofing membrane. True Seal 2-3/8" Metal Membrane Plates and True seal fasteners are used for this securement. Please contact the True Seal Technical department for verification of the defined perimeter lineal dimensions.

B. The 2-3/8" Metal Membrane Plates must be positioned approximately 0.5" (12 mm) from the edge of the defined perimeter lineal dimension and spaced at 12" on center. Only True Seal fasteners or True Seal approved fasteners are used in conjunction with the 2-3/8" Metal Membrane Plates.

C. In all matters, efforts must be made to penetrate the top flutes of the steel deck and fastener depths, penetrations and protrusions should follow the guidelines stated within 3.07 (E-5) of this specification

D. Roof interruptions such as drains, cones etc. will have a minimum of 6 fasteners per penetration.

E. Minor adjustments can be made to the placement of the True Seal fastener and True Seal plate where structural or mechanical/electrical elements below the deck prohibit the location of the securement from above.

### 3.11 True Seal PVC Membrane Flashing Installation:

- A. True Seal PVC flashing membrane shall be installed with the roof membrane as the job progresses and all field seaming with the flashings and “flashing to flashing” seams shall be completed by the end of the work day period.
- B. True Seal PVC flashing shall extend where possible a minimum of 8” (200 mm) above the roof field level above the insulation.
- C. True Seal membrane flashing shall be securely fastened at the top of the flashing detail and prevented from being loosened by the wind and elements until properly secured with mechanical terminations or sheet metal capping installed to FM and SMACMA standards.
- D. Vertical flashings should always be in 100% adhesion with no air bubbles or pockets and rolled with a wide rubber roller to ensure positive contact.
- E. Please refer to Appendix A for acceptable substrates or acceptable insulations for the adherence of the flashing material.

### 3.12 True Seal PVC Walkway Installation:

- A. Walkways shall be provided around rooftop equipment units and regular walk areas and path with high foot traffic and roof top service equipment.
- B. Weldable walkway pads are installed using the same techniques as 3.09 (A, B and C) however no destructive testing can be performed on the walkways. Field seam probing is the preferred after weld technique for testing the field seam. In all cases, the walkway pads must not cross a seam area and stop 3” perpendicular to the seam or detail field weld.
- C. Heavy Duty Cross Grip Walkways are self-ballasting and interlocking.

### 3.13 PVC Metal Edge Flashing Installation:

- A. As with PVC membrane flashings the PVC coated metal flashing shall be installed with the roof membrane as the installation progresses.
- B. All fabrication methods and installations of PVC coated metal flashing shall be governed by the following:
  - 1. Sheet Metal and Air Conditioning National Association Inc. (SMACNA
    - latest edition)

2. FM Global Loss Prevention Data Sheet 1-49 (or latest edition)
3. National Roofing Contractors Association (NRCA – latest edition)
4. Canadian Roofing Contractors Association (CRCA – latest edition)
5. ANSI/SPRI ES-1 Standard (latest edition)
6. Local Building Code Authority

C. PVC metal flashing shall be anchored into the deck, curb units, parapets or wood blocking with approved fasteners as outlined in the products section of this specification. Fasteners should be staggered and at a penetration or protrusion as outlined in 3.07 (E-5) of this specification

D. PVC metal flashing shall be anchored with starter strips not less than 24 gauge cross joints should have “S-Locks” and be secured following guidelines outlined in 3.13 (B) of this specification.

E. True Seal PVC, membrane or membrane cover strips are utilized for sealing of the PVC metal flashings to the True seal membrane system. Hot air welding techniques described in section 3.9 of this specification form the basis of the method or tying – in to the PVC metal.

### 3.14 Metal Flashing Installation (Non PVC Coated Metal):

A. All fabrication methods and installations of metal flashing shall be governed by the following:

1. Sheet Metal and Air Conditioning National Association Inc. (SMACNA – latest edition).
2. Factory Mutual Loss Prevention Data Sheet 1-49 (or latest edition).
3. National Roofing Contractors Association (NRCA – latest edition).
4. Canadian Roofing Contractors Association (CRCA – latest edition).
5. Local Building Code Authority



### 3.15 Detailing:

- A. Detailing of roof interruptions (curbs, vents drains, RTU's, expansion joints, "t" intersections, step-downs, scuppers, hot stacks, wall terminations, "pitch pockets" etc), are in all cases to be completed to the True Seal Standard Detail documents.
- B. In all cases, True Seal branded accessories are to be used for these detailing purposes, and the appropriate accessory is to be used in each application.
- C. Where available True Seal accessories are deemed to not be applicable for a specific detail, a True Seal Deviation Form is the only documentation that confirms approval of an alternate product.
- D. Where True Seal details are deemed to not be applicable for a specific detail, a True Seal Deviation Form is the only documentation that confirms approval of an alternate detail.

### 3.16 Tie-ins:

- A. Temporary tie-ins are to be utilized at the end of each working day period. Where these tie-ins involve modifying the membrane, insulation or accessories, the modified elements must be removed at the start-up of a new work period and disposed of as outlined in section 3.03 (F) of this specification at the cost of the roofing contractor. In all matters the tie-in must be watertight and wind tight and keep the occupants, inventory and building structure free from risk
- B. Permanent tie-ins shall be installed at the end of the project. Please consult with the True Seal Technical Department for permanent tie-in options to ensure long term protection of the occupants, inventory and building structure.

### 3.17 Completion:

Upon completion, the contractor shall clean up and remove from the job site all rubbish, debris and surplus materials.

### 3.18 Maintenance:

Please follow the "Roof Care" guideline available on line at [www.true-seal.com](http://www.true-seal.com) .

End of Section