



**Carlisle SealTite™ PRO Spray Foam Insulation**  
for  
**Commercial Facilities**

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August 2020

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# **Carlisle SealTite™ PRO Spray Foam Insulation for Commercial Facilities**

August 2020

*Information contained in this specification section is intended for use by Specifiers and authorized foam applicators regarding the use of Carlisle SealTite™ PRO open or closed cell spray foam insulation for commercial buildings.*

*Typical areas where spray-applied polyurethane foam insulation can be applied in construction types I, II, III, IV, and V are exterior and interior walls, in wall cavities, vented attics, unvented attic assemblies, floor assemblies or ceiling assemblies, interior and/or exterior side of vertical foundations, the underside of on-grade slabs, and/or in attics and crawl spaces as nonstructural thermal insulation material.*

## **PART I GENERAL**

### **1.01 Description**

Carlisle Spray Foam Insulation (CSFI) SealTite PRO is an open (light-density) or closed (medium-density) cell spray foam insulation that can be applied in wall cavities, floor assemblies or ceiling assemblies, interior and/or exterior side of vertical foundations, the underside of on-grade slabs, and/or in attics and crawl spaces as nonstructural thermal insulation material. The thickness of foam insulation used, will vary based on the desired R-Value, the geographic location, and the type of foam used.

Medium-density (closed-cell) spray foam insulation offers greater R-value than light density (open-cell). Both are available in various formulations offering unique advantages to applicators and solving challenging construction conditions.

Part II of this specification contains summary information on physical properties as shown in the tables included. Additional and more detailed information can be accessed by referencing the applicable product Technical Data Sheet (TDS).

### **1.02 General Design Considerations**

The total thickness of the spray foam insulation shall be determined by the specifier and must at a minimum meet or exceed the local energy code standards. Specifiers / Designers must assess project and climatic conditions to determine if the use of vapor barrier is applicable.

**Note:** Attachment 1 at the end of this section may be referenced for recommended R-values for commercial application in various climatic zones. As an alternative to meeting prescriptive R-value requirements, energy modeling and other software tools may provide for acceptable alternative R-value specifications based on calculated insulation and air sealing performance.

- A. It is the responsibility of the specifier to comply with the various “National Fire Protection Association” standards:

- 1. NFPA 275: Standard Method of Fire Tests for the Evaluation of Thermal Barriers

2. NFPA 285: Standard Fire Test Method for Evaluation of Fire Propagation Characteristics of Exterior Non-Load-Bearing Wall Assemblies Containing Combustible Components
  3. NFPA 286: Standard Methods of Fire Tests for Evaluating Contribution of Wall and Ceiling Interior Finish to Room Fire Growth
- B. Where applicable, Specifiers must also comply with the applicable zoning ordinance and all specific building insurance requirements including but not limited to:
1. **FM 4880**, Approval Standard for Class 1 Fire Rating of Insulated Wall or Wall and Roof/Ceiling Panels, Interior Finish Materials or Coatings and Exterior Wall Systems
  2. **Underwriters Laboratories**, UL 1040 Fire Test of Insulated Wall Construction and or UL 1715: Fire Test of Interior Finish Material
  3. **International Code Council Evaluation Services**, AC-377 Acceptance Criteria for Spray-Applied Foam Plastic Insulation
- C. All SealTite PRO closed-cell spray foam insulation products and SealTite PRO OCX (open-cell) foam meet the requirements of ICC-ES AC377 and Appendix X for use in attics and crawlspaces without the use of a prescriptive ignition barrier or intumescent coating when specific conditions are met. The applicable product Technical Data Sheets shall be referenced for applicable requirements.
- Note:** Other SealTite PRO open-cell spray foam insulation products may be installed without a prescriptive ignition barrier or alternative ignition barrier assembly (intumescent coating) when specific attic access criteria is met. When the specific attic access criteria is **not** met an ignition barrier must be applied as outlined in the individual product Technical Data Sheets.
- D. Depending on the specific project conditions and the desired R-Value, the specifier/ applicator may combine the use of open and closed-cell spray foam insulation as illustrated in the applicable CSFI detail. Moisture migration analysis must be performed especially for facilities located in cold climate regions or those with higher relative humidity levels.
- E. Designer/ Specifier shall ensure adequate air space and drainage plane is provided for condensation control between the exterior cladding and the medium-density spray-applied polyurethane foam insulation on the exterior walls. The use of closed-cell foam, due to its greater R-value, can reduce the overall thickness of the final wall assembly.
- F. While more popular in residential applications, hybrid insulation assemblies combine dissimilar insulation materials to achieve a customized balance of performance and cost. When hybrid attic and hybrid wall assemblies are being considered, the placement of air and vapor impermeable insulation (closed-cell spray foam) and air permeable insulation (open-cell spray foam less than 3.5 inches or fiberglass batt insulation) must be assessed along with the percentage of each product as to the total R-value in order to control condensation. For specific information, the CSFI Specification and Details for residential applications may be referenced or CSFI may be consulted.
- G. When an air barrier or a moisture control layer is specified, compatibility must be verified with the applicable spray foam product being used. Consult Carlisle Spray Foam Insulation for a recommended list of products.
- H. Long-term exposure (>6 months) to ultra-violet (UV) light radiation may degrade the physical and thermal

insulation properties of exposed spray foam insulation. Short-term exposure (<6 months) to UV light may cause discoloration and negatively affect the adhesion of any coatings applied to the foam. Short-term exposure to UV light does not affect physical properties or thermal insulation performance. If a coating is required, the coating shall be applied immediately after the foam is installed to ensure proper coating adhesion. If a coating is not required, UV exposed foam should not be left exposed for longer than 6 months.

### 1.03 Quality Assurance

Building codes are above and beyond the intended purpose of this specification. The building **owner, owner's representative** or **specifier** should verify local codes for applicable requirements and limitations. It is the responsibility of the specifier to review local, state, and regional codes to determine their impact on the specified spray foam insulation.

- A. The installation of the spray-applied polyurethane foam insulation shall be performed by a company that is accredited by SPFA (Spray Polyurethane Foam Alliance) or authorized by CSFI.
- B. The installing workers and the field supervisor shall both be certified as part of the SPFA/PCP (Professional Certification Program), CSFI applicator training program, or approved distributor training program.
- C. CSFI strongly recommends the participation in a Pre-Bid Conference to discuss any details not covered within the specification or to assess the coordination with wall air barrier and the cladding installers.
- D. On retrofit projects, when the collar joint behind the existing masonry veneer is filled with mortar, a moisture control layer may be specified to protect against inward moisture migration.

### 1.04 Submittals

Prior to installation, the authorized applicator must submit to the specifier the Manufacturer's product Technical Data Sheet, product Application Guide, and applicable evaluation reports and Certification

- A. Manufacturer's product Technical Data Sheet and Application Guide for each used, including:
  - 1. Preparation instructions and recommendations
  - 2. Storage and handling requirements
  - 3. Evidence of compliance for insulation products with specified requirements
  - 4. Installation methods (Indicating special procedures, substrate and conditions requiring special treatment.)
- B. Evaluation report from one or more of the following organizations acceptable to the code official or authority having jurisdiction:
  - 1. ICC-ES (International Code Council Evaluation Service)
  - 2. IAPMO-ES (International Association of Plumbing and Mechanical Officials)
  - 3. Intertek
  - 4. QAI (Quality Auditing Institute, Ltd.)

- 5. UL (Underwriter's Laboratories, Inc.)
  - 6. Others
- C. Submit Contractor Company Certifications for all workers on the jobsite

#### **1.05 Job Conditions**

- A. Prior to the application of spray-applied polyurethane foam insulation, the temperature of the substrate shall be within the limits described in the respective product Application Guide. The service temperature of any surface to be sprayed shall not exceed 180°F (82°C).
- B. Moisture in the form of rain, fog, frost, dew, or relative humidity >85% may affect the physical properties of the installed insulation.
- C. When applying spray foam on the exterior of walls, wind speeds in excess of 10 mph may adversely affect the development and physical properties of the installed spray foam insulation as well as overspray problems. When wind speed is greater than 3 mph, use windscreens to prevent overspray.
- D. All surfaces must be free of dirt, dust, and other debris. Apply the spray foam insulation to clean dry surfaces at the temperature ranges listed on the applicable Application Guide.
- E. Chemical compatibility with other wall components will depend on type of air and vapor barrier used. Refer to the Carlisle Spray Foam Insulation Material Compatibility Table for a list of commonly used building materials. Carlisle Spray Foam Insulation should be contacted for verification of compatibility of other products that may come in contact with SealTite™ PRO products.

#### **1.06 Product Delivery, Storage and Handling**

Comply with all applicable code requirements. Deliver materials to the site in their original, tightly sealed containers, all clearly labeled with manufacturer's name, product identification and lot number.

- A. Safely store materials in their original containers out of the weather. Keep materials dry and within the temperature limits specified by the manufacturer. Storage temperatures for SealTite PRO closed-cell spray foam insulation products are between 50°- 80°F (10°-27°C) minimum for 48 hours before use. Open-cell products may be heated at the job site. Consult the applicable product Application Guide for additional information.
- B. All materials shall be stored in compliance with applicable fire and safety requirements.
- C. Protect materials from damage during transit, handling, storage, and installation.
- D. Proper storage is important before and during use, on the job site. Improper storage conditions can make the components unusable. Do not allow products to freeze.
- E. When storing materials at job site, the CSFI Authorized Applicator must comply with the requirements of the specifier / building owner to prevent disturbance to the building and site.

## **PART II        PRODUCTS**

### **2.01    General**

Carlisle spray foam insulation is registered under the trademark of SealTite™ PRO. SealTite PRO is available in various open-cell and closed-cell formulations to accommodate specific project and labor conditions.

SealTite PRO is a two component, open-cell (light density) or a closed-cell (medium density), one-to-one by volume spray-applied polyurethane foam insulation. These spray foam insulation products are designed for use in commercial and residential applications in lieu of traditional forms of insulating materials.

The typical areas where spray-applied polyurethane foam insulation is applied are to. exterior and interior walls, in wall cavities, vented attics, unvented attic assemblies, floor assemblies or ceiling assemblies, interior and/or exterior side of vertical foundations, the underside of on-grade slabs, and/or in attics and crawl spaces as nonstructural thermal insulation material.

### **2.02    Open-Cell Spray Foam Insulation Products**

#### **A.    SealTite PRO Open Cell**

SealTite PRO Open Cell is a two component, light density, one to one by volume spray-applied polyurethane foam insulation. SealTite PRO Open Cell contains ZERO ozone depleting blowing agents and can be used in Assembly specific attic or crawlspace applications without an Ignition Barrier. Refer to table in Paragraph F.

#### **B.    SealTite PRO High Yield**

SealTite PRO High Yield is a two-component, light density, one to one by volume spray-applied polyurethane foam insulation optimized for higher yields and applicator productivity. SealTite PRO High Yield contains ZERO ozone depleting blowing agents and can be used in Assembly specific attic or crawlspace applications without an Ignition Barrier. Refer to table in Paragraph F.

#### **C.    SealTite PRO No Mix**

SealTite Pro No Mix is a two component, light density, one to one by volume spray-applied polyurethane foam insulation that does not require mixing or agitation of the resin prior to application. SealTite PRO No Mix contains ZERO ozone depleting blowing agents and can be used in Assembly specific attic applications without an Ignition Barrier Coating. Refer to table in Paragraph F.

#### **D.    SealTite PRO No Trim 21**

SealTite PRO No Trim 21 is a two component, light density, one to one by volume spray-applied polyurethane foam insulation. SealTite PRO No Trim 21 is a 100% water blown spray foam insulation engineered for applications needing both higher insulation values than traditional open-cell foams and higher yields than closed-cell foam. SealTite PRO No Trim 21 achieves a R-15 in a 2" x 4" wall cavity at 3.5 inches and a R-21 in a 2" x 6" wall cavity at 5 inches, meeting or exceeding the most recent building codes. SealTite PRO No Trim 21 maximizes applicators' productivity by eliminating the need for additional passes and the trimming, cleaning, and disposing of excess foam. In a typical residential new construction project SealTite™ Pro No Trim 21 can reduce application times by as much as 50%. SealTite PRO No Trim 21 contains ZERO ozone depleting blowing agents. Refer to table in Paragraph F.

#### E. SealTite PRO OCX

SealTite PRO OCX is a two component, light density, one to one by volume spray-applied polyurethane foam insulation that complies with AC-377 Appendix X and can be installed in attics and crawlspaces without an ignition barrier. SealTite™ PRO OCX contains +/- 14% bio, renewable, recycled, and sustainable content and ZERO ozone depleting blowing agents. Refer to table in Paragraph F.

#### F. Physical Properties of SealTite PRO Open-Cell Foam Insulation Products

| Physical Property   | Test Method ASTM | SealTite™ Pro Open Cell | SealTite™ Pro High Yield | SealTite™ Pro No Mix | SealTite™ Pro No Trim 21 | SealTite™ Pro OCX |
|---|------------------|-------------------------|--------------------------|----------------------|--------------------------|-------------------|
| R-Value, @ 1"   | C 518            | 3.7                     | 3.6                      | 3.8                  | 4.4                      | 3.7               |
| R-Value, @ 3.5"   | C 518            | 13                      | 13                       | 13                   | 15                       | 12                |
| Core Density, lb/cf   | D 1622           | 0.50                    | 0.45                     | 0.5                  | 0.75                     | 0.5               |
| Open-cell content, %, min.                                  | D 2856           | 90                      | 97                       | 97                   | 97                       | 95                |
| Air Impermeable, max, (L/s-m2) @ 3.5"                       | E 283            | 0.02                    | 0.02                     | 0.02                 | 0.02                     | 0.02              |
| Tensile Strength, psi, min.                                 | D 1623           | 3                       | 5                        | 5.19                 | 4.7                      | 3.71              |
| Dimensional Stability, 28 days, percent volume change, max. | D 2126           | 15                      | 15                       | 5                    | 4                        | 15                |
| Flame Spread, max.  | E-84             | 25                      | 10                       | 20                   | 20                       | 0                 |
| Smoke Development, max.                                     | E-84             | 450                     | 250                      | 400                  | 400                      | 300               |

**Note:** Consult product Technical Data Sheets pertaining to use of these products and latest property data.

### 2.03 Closed-Cell Spray Foam Insulation Products

#### A. SealTite PRO Closed Cell

SealTite™ Pro Closed Cell is a two-component, medium density, one to one by volume spray-applied polyurethane foam. Refer to table in Paragraph C.

#### B. SealTite PRO One Zero

SealTite PRO One Zero is a two-component, next generation HFO blown medium density spray-applied polyurethane foam. The HFO technology allows SealTite PRO One Zero to be produced with a Global Warming



Potential (GWP) of less than One and with an Ozone Depletion Potential (ODP) of Zero. Refer to table in Paragraph C.

**C. Physical Properties of Closed Cell Foam**

| Physical Property  | Test Method<br>ASTM | SealTite™ Pro Closed<br>Cell | SealTite™ Pro One<br>Zero |
|--|---------------------|------------------------------|---------------------------|
| R-Value, @ 1"  | C 518               | 6.9                          | 6.9                       |
| R-Value, @ 3.5"  | C 518               | 24                           | 24                        |
| Core Density, lb/c.ft.   | D 1622              | 2.00                         | 2.00                      |
| Closed-cell content, %, min.                                   | D 2856              | 90                           | 90                        |
| Water Vapor Transmission, Permeance @<br>3.5"                  | E 96                | 0.23                         | 0.23                      |
| Air Impermeable, max, (L/s-m <sup>2</sup> ) @ 1"               | E 2178              | 0.02                         | 0.02                      |
| Tensile Strength, psi, min.                                    | D 1623              | 60                           | 60                        |
| Dimensional Stability, 28 days, percent<br>volume change, max. | D 2126              | 9                            | 9                         |
| Flame Spread, max.   | E-84                | 25                           | 25                        |
| Smoke Development, max.  | E-84                | 450                          | 450                       |
| Compressive Strength, psi                                      | D-1621              | 47                           | 47                        |

**2.04 Thermal Barriers**

International Building Code (IBC) and International Residential Code (IRC) require that spray-applied polyurethane foam insulation be separated from the building interior by a code prescribed 15-minute thermal barrier or a code-approved alternative. The IBC and IRC specifically name gypsum board at a minimum thickness of ½" as a code prescribed 15-minute thermal barrier. Materials equivalent to ½-inch gypsum wallboard can be used as thermal barriers provided, they have been tested in accordance with the IBC or IRC to limit temperature rise and remain in place for 15 minutes.

**A. Alternative Thermal Barrier Assemblies**

SealTite PRO spray-applied polyurethane foam insulation may be covered with an intumescent coating to create an alternative thermal barrier assembly provided the assembly has been specifically approved based on large-scale fire testing representing the actual end-use configuration. Approved alternative assemblies must

have a valid evaluation report. Refer to product Technical Data Sheets and product evaluation reports for approved intumescent coatings and application rates.

## **2.05 Ignition Barriers**

- A. SealTite PRO OCX SealTite PRO Closed Cell and SealTite PRO One Zero meet the requirements of ICC-ES AC377 Appendix X for use in attics and crawlspaces without a prescriptive ignition barrier or intumescent coating when the following conditions are met:
1. Entry is only to service utilities in the attic or crawlspace and no storage is permitted.
  2. Attic or crawlspace areas cannot be connected.
  3. Air from the attic or crawlspace cannot be circulated to other parts of the building.
  4. In accordance with IBC Section 1203.3 or IRC Section R408.1, under floor (crawlspace) ventilation is provided as applicable.
  5. In accordance with IBC 1203.2 or IRC Section R806, attic ventilation is provided as applicable.
  6. In accordance with 2012 and 2009 IMC (International Mechanical Code®) Section 701, or 2006 IMC Sections 701 and 703, combustion air is provided.
  7. The foam plastic insulation is limited to the maximum thickness and density tested.
  8. The installed coverage rate of coatings, if part of the insulation system shall be equal or greater than that tested.
- B. Excluding products listed in 2.05A, all other SealTite PRO products meet the requirements of ICC-ES AC377 Appendix X for use in attics and crawlspaces without a prescriptive ignition barrier when covered with an approved intumescent coating and the following conditions are met:
1. Entry is only to service utilities in the attic or crawlspace and no storage is permitted.
  2. Attic or crawlspace areas cannot be connected.
  3. Air from the attic or crawlspace cannot be circulated to other parts of the building.
  4. In accordance with IBC Section 1203.3 or IRC Section R408.1, under floor (crawlspace) ventilation is provided as applicable.
  5. In accordance with IBC 1203.2 or IRC Section R806, attic ventilation is provided as applicable.
  6. In accordance with 2012 and 2009 IMC (International Mechanical Code®) Section 701, or 2006 IMC Sections 701 and 703, combustion air is provided.
  7. The foam plastic insulation is limited to the maximum thickness and density tested.
  8. The installed coverage rate of coatings, if part of the insulation system shall be equal or greater than that tested.

- C. For intumescent coatings required for code compliance, reference the applicable SealTite PRO product Technical Data Sheet and Evaluation Report for coating type and application rate.

## **PART III EXECUTION**

*Safety Data Sheets (SDS) must always be on location during transportation, storage, and application of SealTite PRO spray-applied polyurethane foam products.*

*The applicator shall follow all safety regulations as recommended by OSHA, the Spray Polyurethane Foam Alliance (SPFA) and the Center for the Polyurethanes Industry (CPI) of the American Chemistry Council (ACC) and/or other agencies having jurisdiction. To ensure most current installation requirements are met and techniques are followed, product Data Sheets and Application Guides should be available on site and consulted.*

### **3.01 General**

Verify that substrates are clean, dry, and free of dust, debris, oil, solvents, and other materials that may adversely affect spray-applied polyurethane foam adhesion.

#### **A. Personal safety**

Due to the reactive nature of these components, respiratory protection is mandatory. The vapors and liquid aerosols present during application and for a short period thereafter must be considered and appropriate protective measures taken to minimize potential risks from overexposure through inhalation, skin, or eye contact. These protective measures include OSHA approved:

1. ventilation, safety training for installers and other workers
2. The use of appropriate personal protective equipment.
3. Medical surveillance program based on the American Chemistry Council (ACC) Guidelines.

It is imperative that the applicator read and become familiar with all available information on proper use and handling of spray polyurethane foam. Additional information is available at [www.carlislefoam.com](http://www.carlislefoam.com) or by contacting the Technical Services department of Carlisle Spray Foam Insulation.

- B. Clear building occupants and non-SPF personnel from building. Consider utilizing the best practices for the use of containment and ventilation techniques detailed in the U.S. Environmental Protection Agency's "Ventilation Guidance for Spray Polyurethane Foam Application": <http://www.epa.gov/dfe/pubs/projects/spf/ventilation-guidance.html>
- C. Do not begin application of spray-applied polyurethane foam insulation until substrate and environmental conditions are satisfactory. Mask/Shield adjacent areas to protect against overspray.

### **3.02 Preparation**

Do not proceed with the foam application until all substrates have been properly prepared. Deviations from the

CSFI specifications must be communicated to the specifier and accepted by Carlisle.

- A. Isolate the spray area, and post warning signs, as needed, to prevent entry by other persons not wearing appropriate Personal Protective Equipment (PPE).
- B. Ensure that the application of the foam insulation is coordinated with other affected trades to prevent work interruption and construction progress.
- C. Maintain environmental and substrate conditions (temperature, humidity, and ventilation) within the limits recommended by the CSFI for optimum results. Do not apply products when conditions are beyond those listed by CSFI in the applicable product Technical Data Sheet and Application Guide.
- D. Prepare substrates following CSFI recommendations as listed below.
  - 1. Review the placement area to determine that the final location will not be within 3 inches (76 mm) of any heat source where the temperature may exceed 200 °F (93 °C) per ASTM C 411, or in accordance with authorities having jurisdiction.
  - 2. Mask and protect adjacent surfaces from overspray or damage.
  - 3. Remove foreign materials, dirt, dust, grease, oil, paint, laitance, efflorescence, and other substances that will adversely affect the foam application.
  - 4. Comply with CSFI written installation instructions and published details for preparing cavities to make sure they are free of any foreign material that may impede application.
  - 5. Verify that work by other trades is completed prior to proceeding with foam application.
- E. When certain preparations are the responsibility of another contractor, the building owner representative/specifier shall be notified in writing of deviations from CSFI recommended installation tolerances and conditions. CSFI shall be consulted to determine suitability.
- F. Clear building occupants and non-SPF personnel from building. Consider utilizing the best practices for the use of containment and ventilation techniques detailed in the U.S. Environmental Protection Agency's "Ventilation Guidance for Spray Polyurethane Foam Application": <http://www.epa.gov/dfe/pubs/projects/spf/ventilation-guidance.html>

### 3.03 Spray-applied polyurethane foam Application

The thickness of the spray foam insulation will vary based on applicable energy code being followed and the wall construction method (wood, metal, or masonry). Attachment 1 located at the end of this section contains R-value recommendations for commercial and residential walls in various climate zones. These tables may be referenced to recommend minimum R-values for projects where the spray foam contractor is serving as the specifier.

**Note:** Comply with CSFI's written instructions applicable to products and applications, as listed on drum labels, product Technical Data Sheets and Application Guides.

- A. Apply insulation to the specified thickness as indicated on the drawings or as designated by the building owner/representative.
- B. When applying spray-applied polyurethane foam insulation to temperature sensitive materials such as low voltage wiring, chlorinated polyvinylchloride (CPVC), or PEX tubing consult the CSFI Material Compatibility Sheet for the recommended application procedure.
- C. Apply foam insulation over entire area to be insulated and fill voids around doors, windows and around accessible surfaces and penetrations.
- D. Trim excess foam and remove all debris and foam particles using proper disposable practices.

### **3.04 FIELD QUALITY CONTROL**

- A. Inspect the sprayed foam insulation to verify the correct insulation thickness.
- B. An installation certificate documenting the foam type, manufacturer, and product name and lot/batch number, as well as any fire protective products must be completed by the contractor.

The Insulation Certificate shall be signed and dated by the contractor representative and delivered to the building owner or general contractor and or posted in a conspicuous location on the job site.

### **3.05 PROTECTION**

Do not permit subsequent work to disturb applied foam insulation.

- A. Protect installed foam insulation from damage due to harmful weather exposures, physical abuse, and other causes.
- B. Provide temporary coverings in places where insulation is subject to abuse.
- C. Touch-up, repair, or replace damaged foam before the substantial completion phase is reached.
- D. Install all required fire protective coatings or coverings over the foam as soon as possible and according to the manufacturer's guidelines.

### **3.06 CONSTRUCTION WASTE MANAGEMENT**

- A. Plan and coordinate the insulation work to minimize the generation of offcuts and waste.
- B. Separate waste materials in accordance with the Waste Management Plan, and to the extent economically feasible.
- C. Clean work area and remove all waste and equipment from interior and exterior spaces, leaving the project site in and orderly fashion.

## **END OF SECTION**

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This Specification represents the applicable information available at the time of its publication. Owners, Specifiers and Carlisle authorized roofing applicators should consult CSFI or their Manufacturer's Representative for any information that has subsequently been made available.



## Carlisle SealTite™ PRO

### IECC Energy Standards for Residential and Commercial Walls "Attachment I"

August 2020

Information contained in this attachment is intended for Specifiers and commercial spray foam contractor to determine the total prescriptive R-Value needed to insulate commercial exterior walls.

The standards contained herein are based on the 2018 IECC (International Energy Conservation Codes) and are considered minimums. They may be used when meeting or exceeding the local governing codes but shall not be considered as a replacement for R-Values specified by the architect or designated by the building owner. The table reflects various types of wall systems (wood, metal, or masonry) located in various geographical areas designated as 1 thru 8, as shown on the map below.

As an alternative to meeting prescriptive R-value requirements, energy modeling and other software tools may provide for acceptable alternative R-value specifications based on calculated insulation and air sealing performance.

| Climate Zone | Wood Frame                          | Metal Frame    | Metal Bldg.    | Mass    |
|--------------|-------------------------------------|----------------|----------------|---------|
| 1            | R13+R3.8ci<br>or R-20               | R13+<br>R5ci   | R13+<br>R6.5ci | R5.7ci  |
| 2            | R13+R3.8ci<br>or R-20               | R13+<br>R5ci   | R13+<br>R6.5ci | R5.7ci  |
| 3            | R13+R3.8ci<br>or R-20               | R13+<br>R7.5ci | R13+R13ci      | R7.6ci  |
| 4            | R13+R3.8ci<br>or R-20               | R13+<br>R7.5ci | R13+R13ci      | R9.5ci  |
| 5/4 Marine   | R13+R3.8ci<br>or R20                | R13+<br>R7.5ci | R13+R13ci      | R11.4ci |
| 6            | R13+ <b>R7.5ci</b><br>or R20+R3.8ci | R13+<br>R7.5ci | R13+R13ci      | R13.3ci |
| 7            | R13+ <b>R7.5ci</b><br>or R20+R3.8ci | R13+<br>R7.5ci | R13+R13ci      | R15.2ci |
| 8            | R13+ <b>R15.6ci</b><br>or R20+R10ci | R13+<br>R7.5ci | R13 +R13ci     | R25ci   |

#### 2018 IECC Commercial Building Walls R-value

Table above, modern energy code R-value requirements for commercial building walls using Cavity and continuous insulation on the building exterior.

Table Notes:



- 1 IECC = International Energy Conservation Code published by the International Code Council, Inc. Refer to ASHRAE 90.1 for alternate code-compliant wall R-values.
- 2 Wall R-values are shown as cavity insulation alone or as XX + X where the first number is the cavity insulation R-value and the second is for continuous insulation. Continuous insulation “ci” R-values are shown in bold.
- 3 The commercial Wall R-values are based on all commercial building use groups.
- 4 Refer to the climate zone map below, for geographic extent of climate zones listed above.

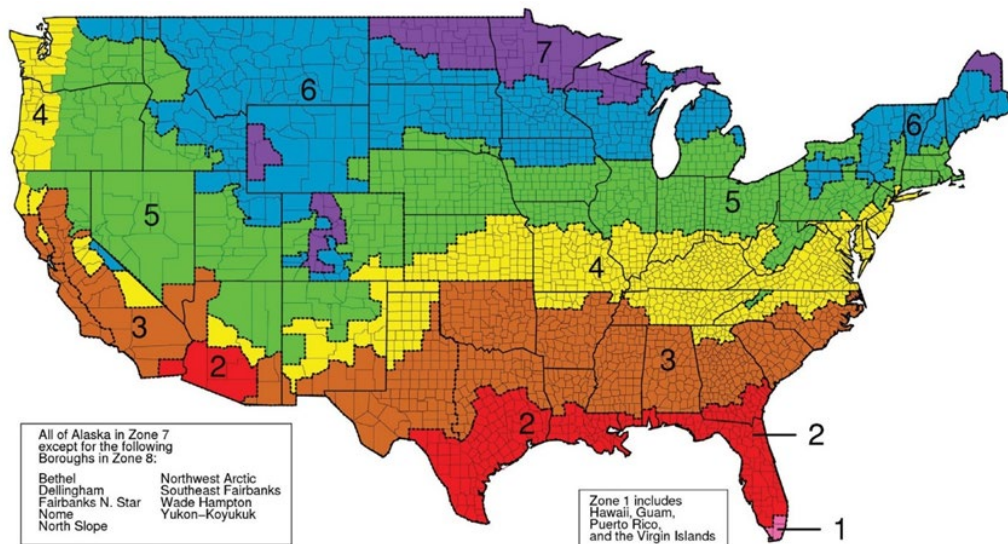


Figure 4. U.S. Climate Zone Map

Source: <http://resourcecenter.pnl.gov/>, 4/17/2011

## End of Section

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# SPEC ATTACHMENT

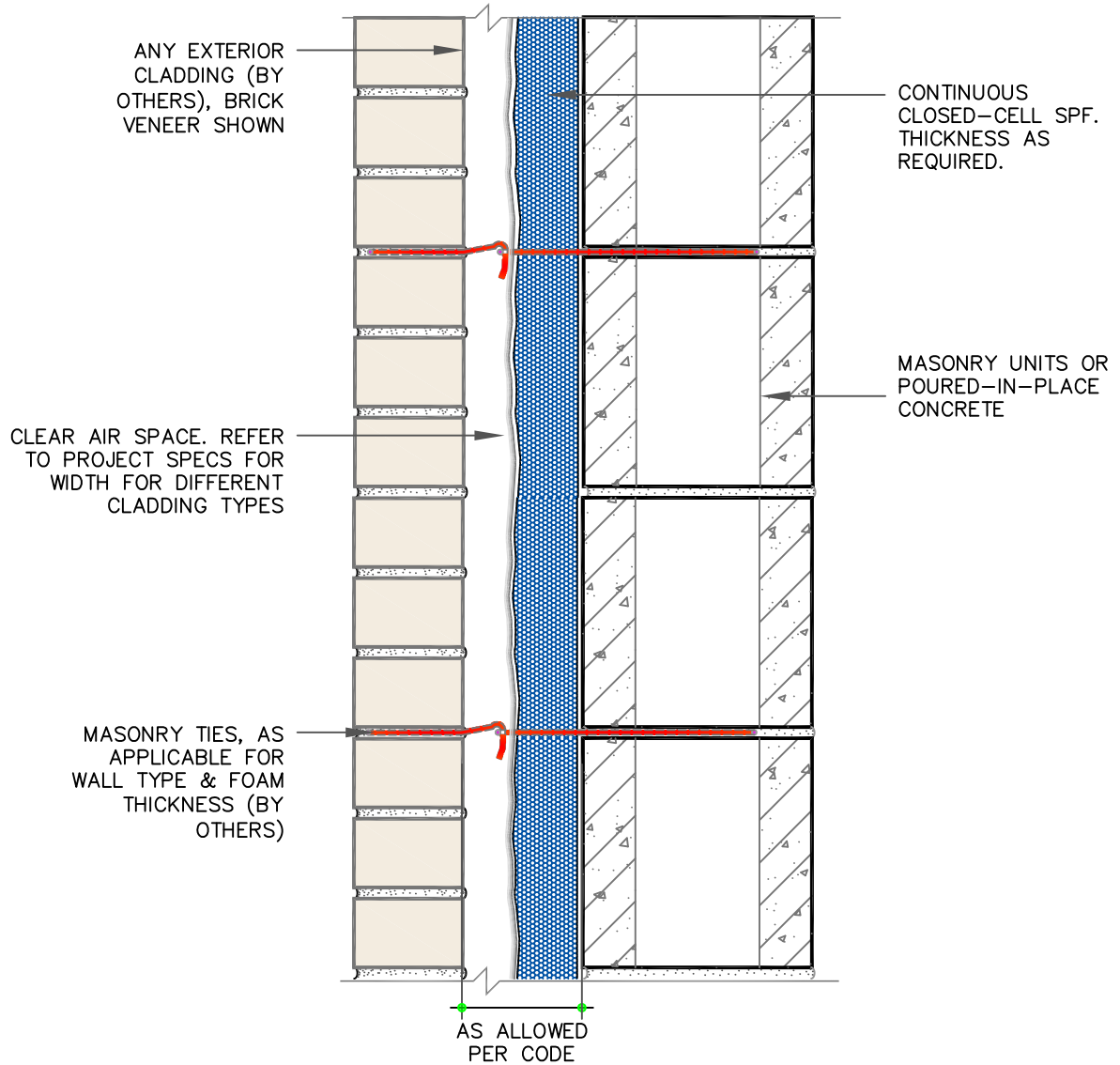
## CARLISLE SPRAY FOAM INSULATION

### Carlisle SealTite™ Pro For Commercial Facilities

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SPF SPRAY POLYURETHANE FOAM  
ccSPF CLOSED CELL SPRAY POLYURETHANE FOAM  
c.i. CONTINUOUS INSULATION  
LGMF LIGHT GAUGE METAL FRAME

0

NOTE(S)

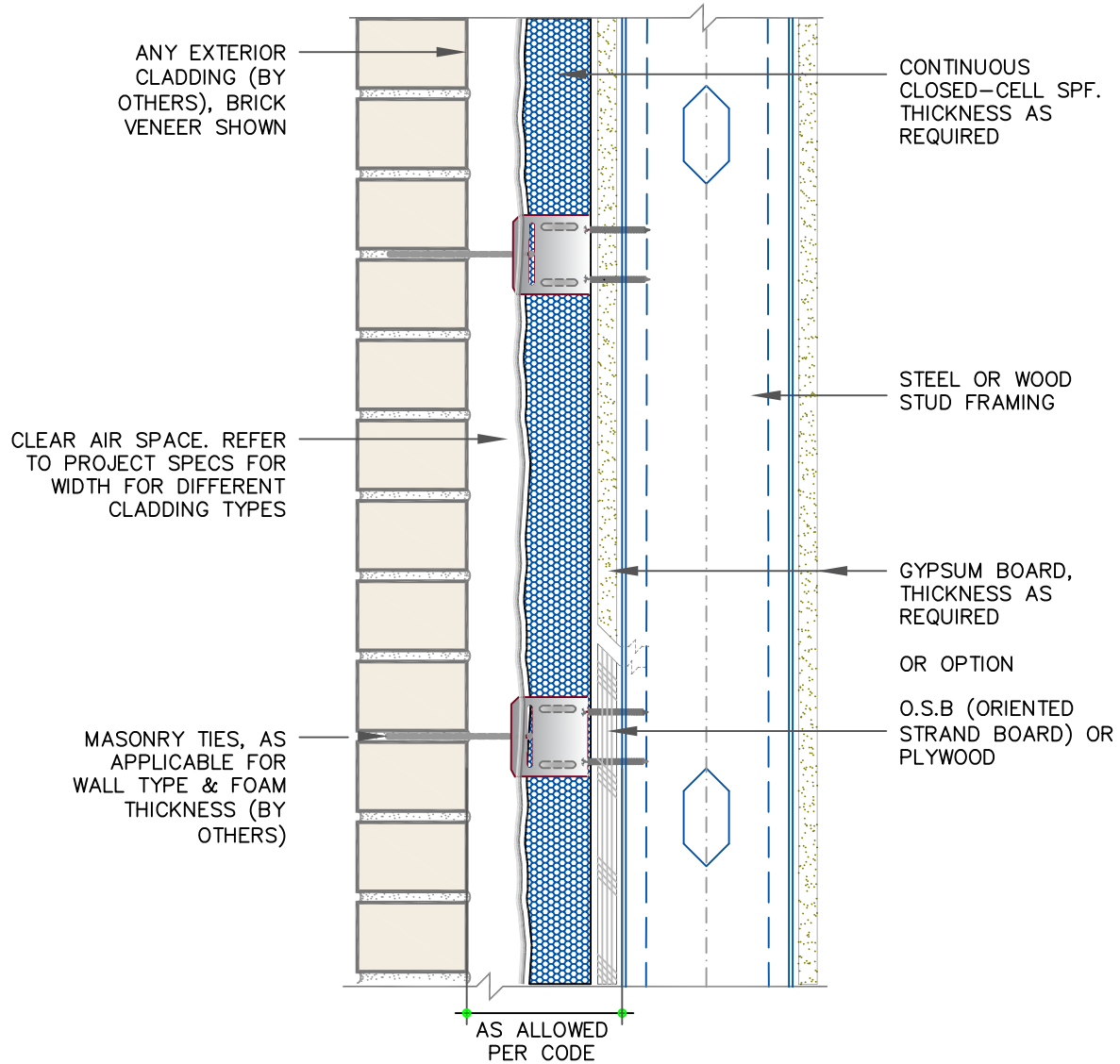


SPRAYED POLYURETHANE FOAM

WALL TYPE A:  
BACKUP CMU WALL –  
EXTERIOR FOAM APPLICATION

A

For additional information, refer to Specifications



SPF SPRAY POLYURETHANE FOAM  
 ccSPF CLOSED CELL SPRAY POLYURETHANE FOAM  
 c.i. CONTINUOUS INSULATION  
 LGMF LIGHT GAUGE METAL FRAME

0

NOTE(S)

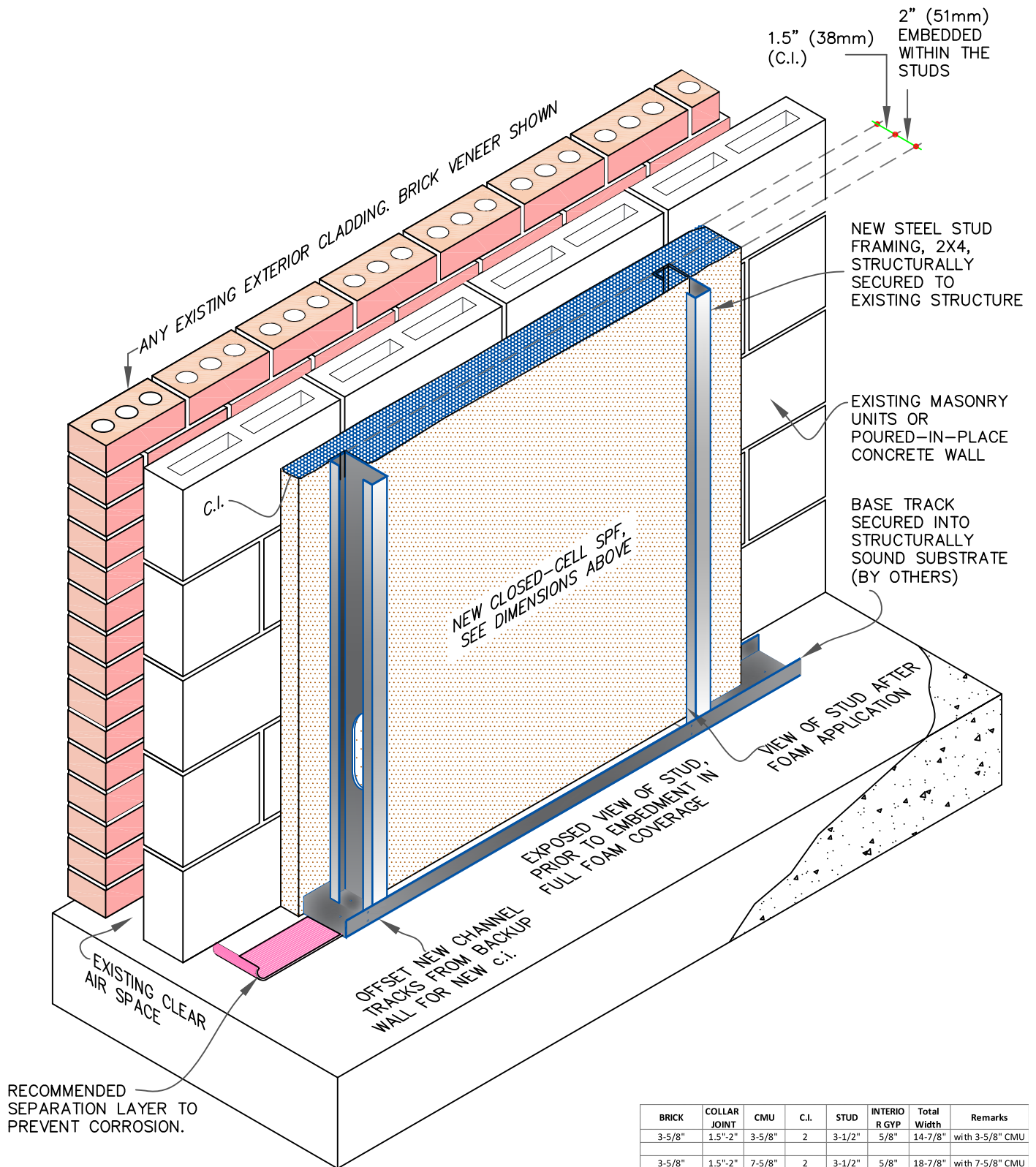


SPRAYED POLYURETHANE FOAM

## WALL TYPE B: BACKUP STUD WALL – EXTERIOR FOAM APPLICATION

B

For additional information, refer to Specifications



## WALL TYPE C: RETROFIT EXISTING WALL WITH CLEAR AIR CAVITY

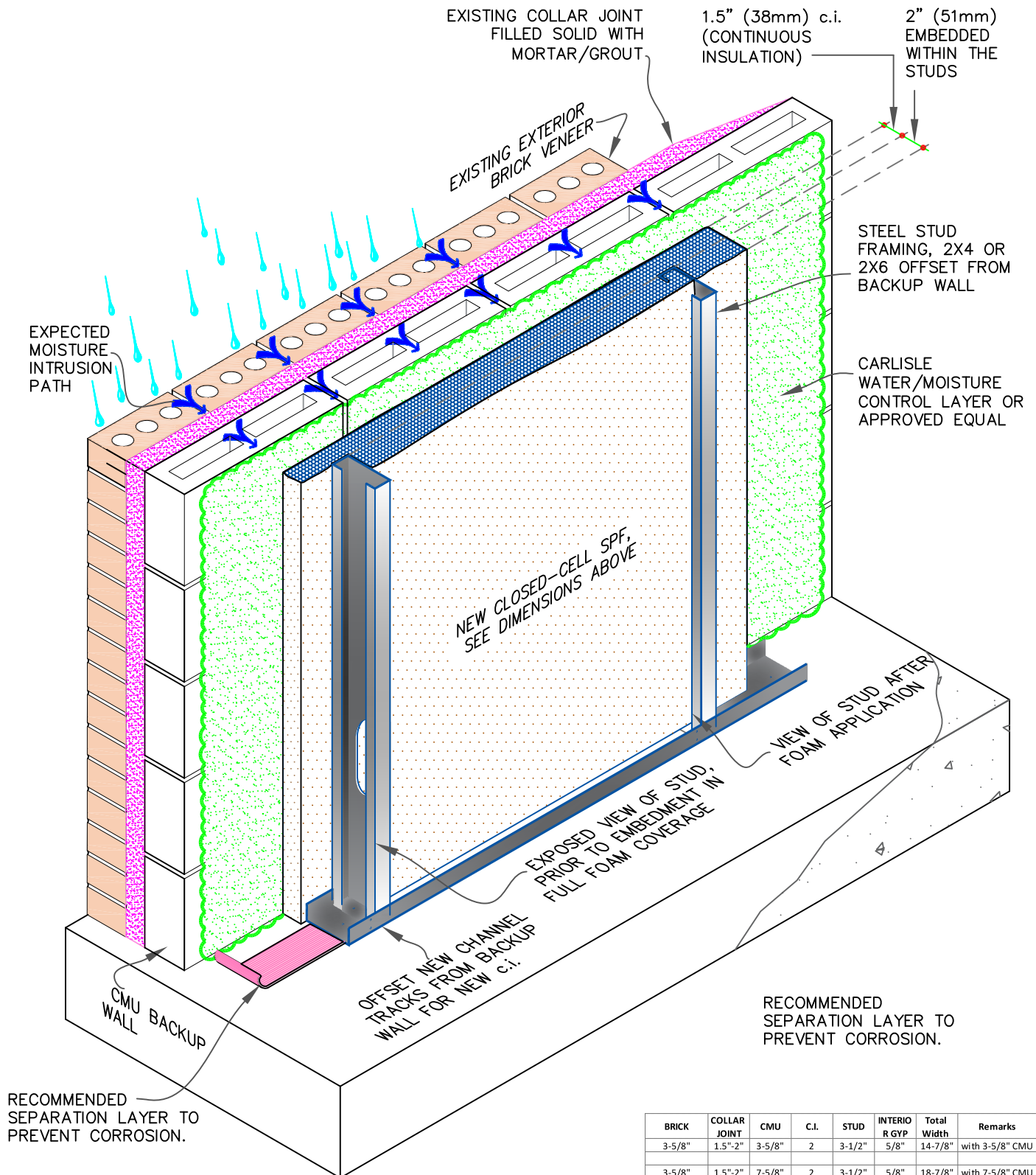
C

SPF SPRAY POLYURETHANE FOAM  
ccSPF CLOSED CELL SPRAY POLYURETHANE FOAM  
c.i. CONTINUOUS INSULATION  
LGMF LIGHT GAUGE METAL FRAME

NOTE(S)  
SPRAYED POLYURETHANE FOAM

For additional information, refer to Specifications





| BRICK  | COLLAR JOINT | CMU    | C.I. | STUD   | INTERIO R GYP | Total Width | Remarks         |
|--------|--------------|--------|------|--------|---------------|-------------|-----------------|
| 3-5/8" | 1.5"-2"      | 3-5/8" | 2    | 3-1/2" | 5/8"          | 14-7/8"     | with 3-5/8" CMU |
| 3-5/8" | 1.5"-2"      | 7-5/8" | 2    | 3-1/2" | 5/8"          | 18-7/8"     | with 7-5/8" CMU |



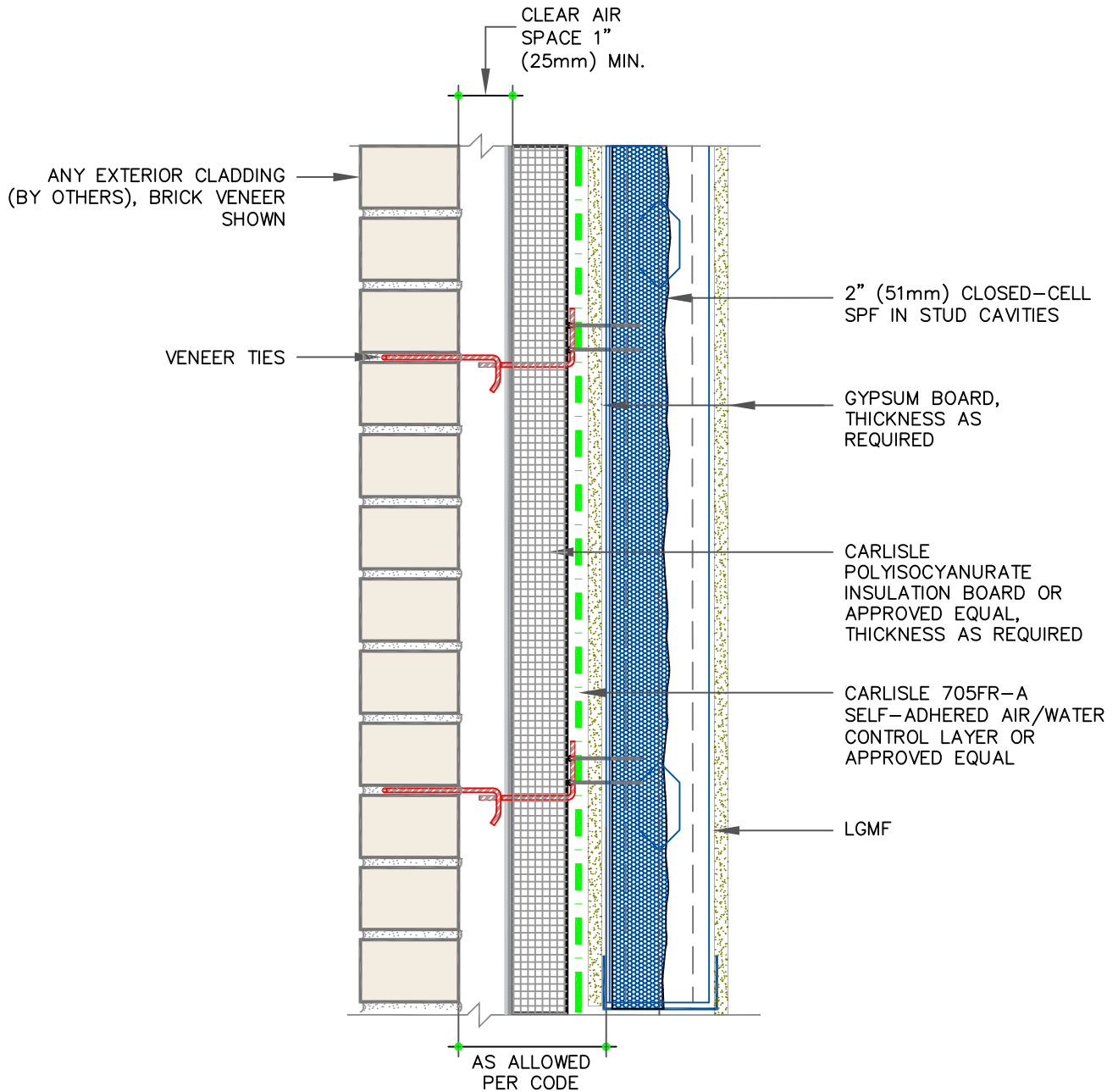
SPF SPRAY POLYURETHANE FOAM  
ccSPF CLOSED CELL SPRAY POLYURETHANE FOAM  
c.i. CONTINUOUS INSULATION  
LGMF LIGHT GAUGE METAL FRAME

NOTE(S)  
 SPRAYED POLYURETHANE FOAM

## WALL TYPE D: RETROFIT EXISTING WALL WITH FILLED COLLAR BOND

For additional information, refer to Specifications

D



SPF SPRAY POLYURETHANE FOAM  
 ccSPF CLOSED CELL SPRAY POLYURETHANE FOAM  
 c.i. CONTINUOUS INSULATION  
 LGMF LIGHT GAUGE METAL FRAME

0

NOTE(S)

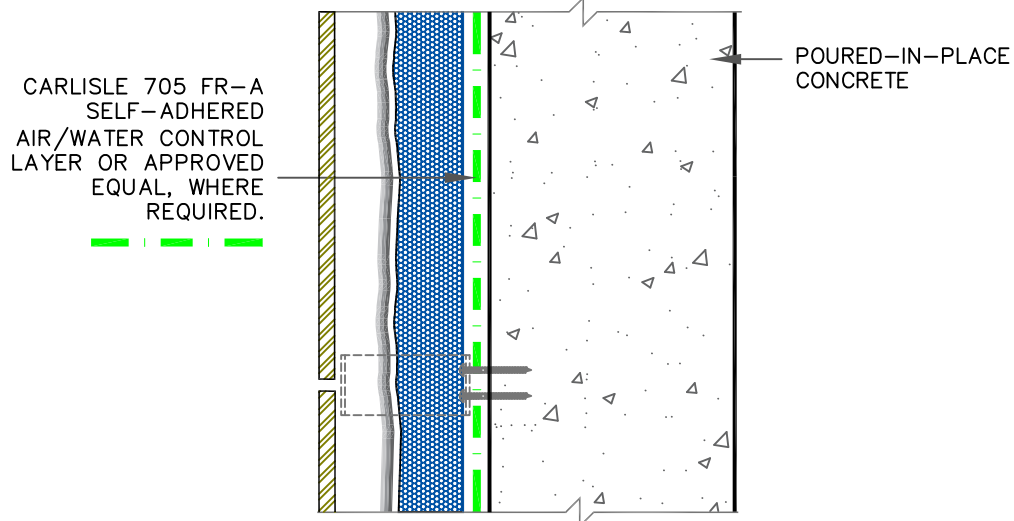
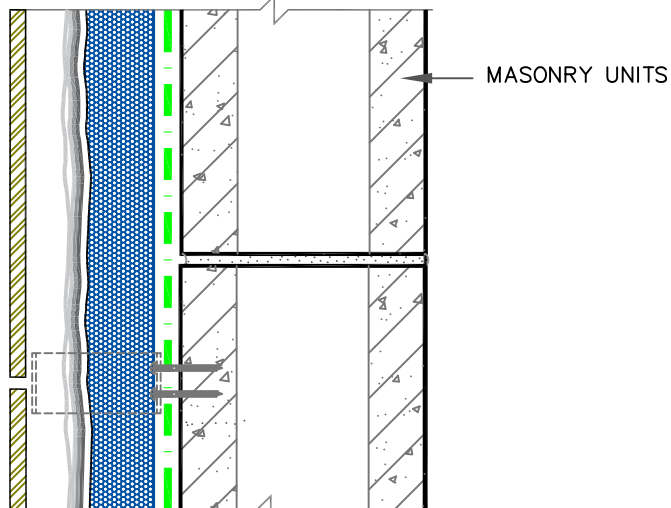
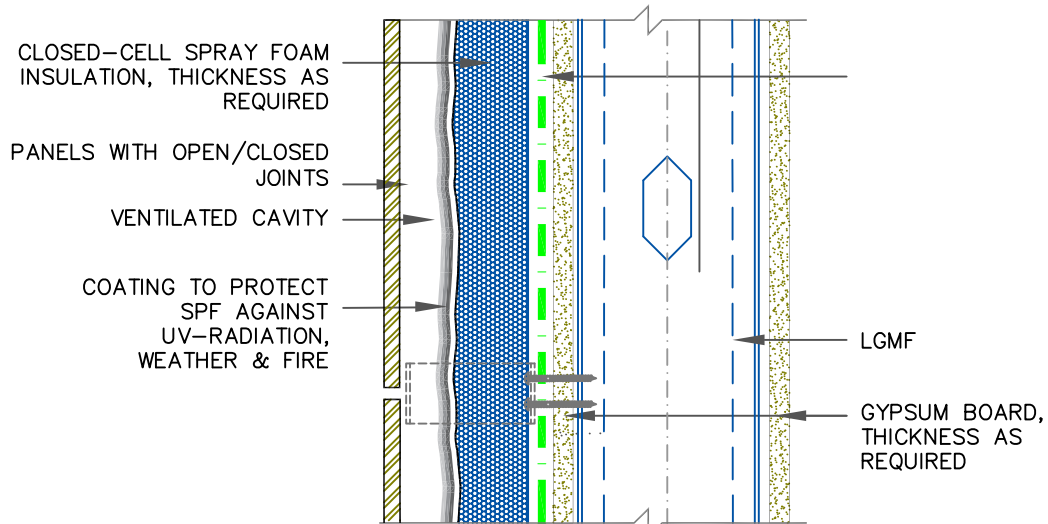


SPRAYED POLYURETHANE FOAM

## WALL TYPE E: COMBINATION OF SPF & RIGID BOARD INSULATION

E

For additional information, refer to Specifications



SPF SPRAY POLYURETHANE FOAM  
ccSPF CLOSED CELL SPRAY POLYURETHANE FOAM  
c.i. CONTINUOUS INSULATION  
LGMF LIGHT GAUGE METAL FRAME

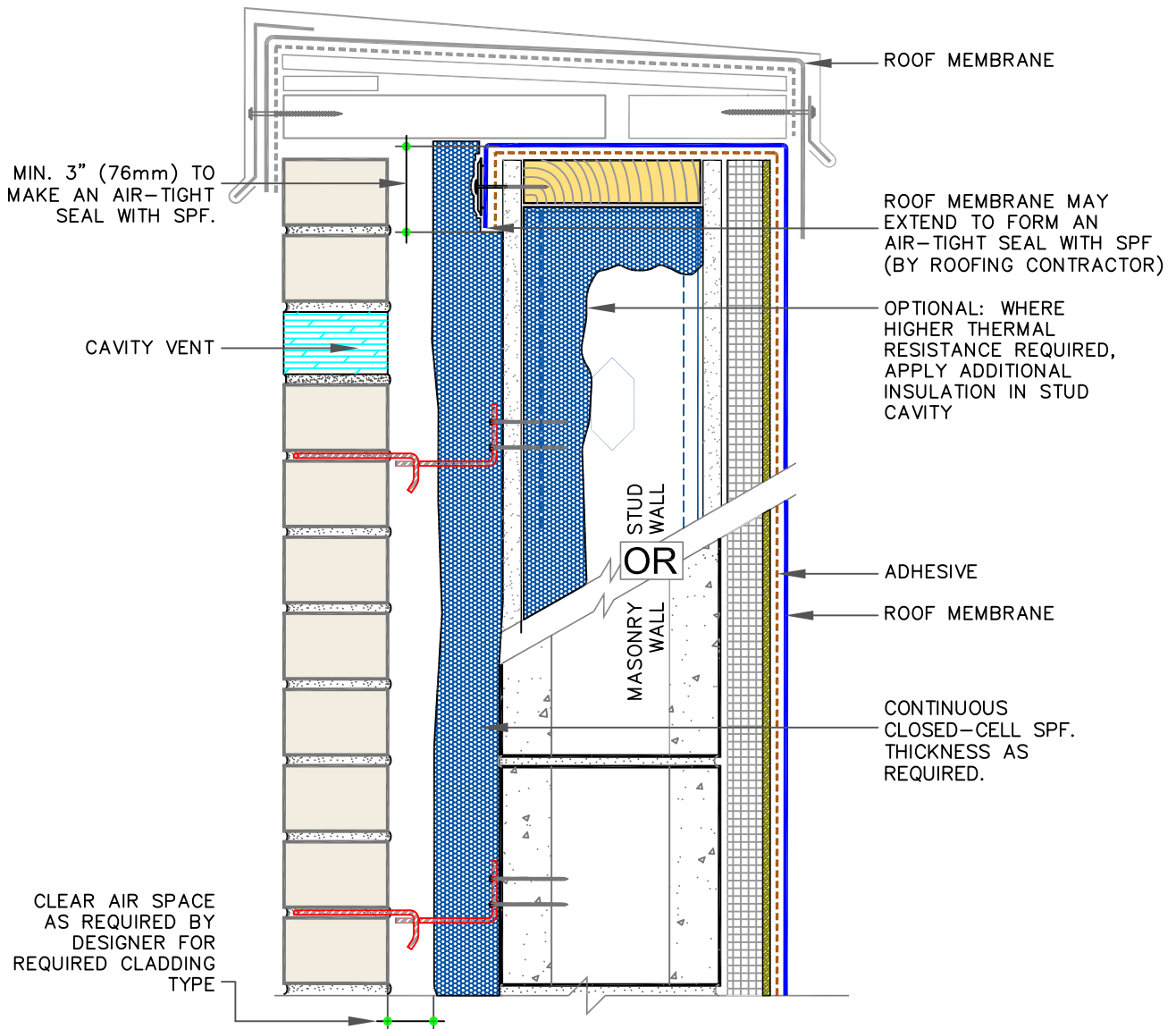
0 NOTE(S)  
SPRAYED POLYURETHANE FOAM

WALL TYPE F:  
EXTERIOR CLADDING WITH  
OPEN JOINTS & FOAM  
COATING

For additional information, refer to Specifications

F





SPF SPRAY POLYURETHANE FOAM  
ccSPF CLOSED CELL SPRAY POLYURETHANE FOAM  
c.i. CONTINUOUS INSULATION  
LGMF LIGHT GAUGE METAL FRAME

0

NOTE(S)

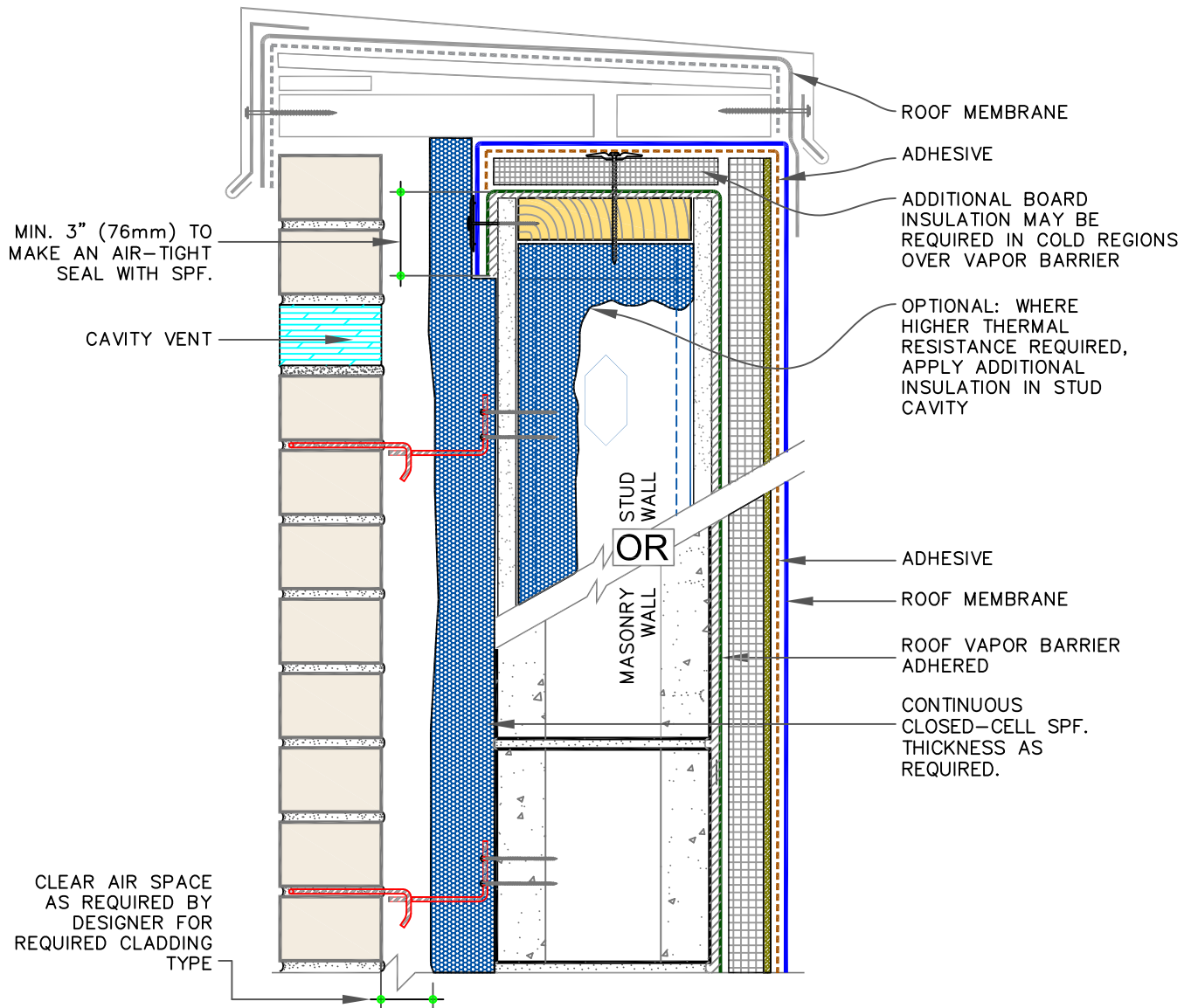


SPRAYED POLYURETHANE FOAM

## PARAPET WITHOUT ROOF VAPOR BARRIER

For additional information, refer to Specifications

1.1



SPF SPRAY POLYURETHANE FOAM  
ccSPF CLOSED CELL SPRAY POLYURETHANE FOAM  
c.i. CONTINUOUS INSULATION  
LGMF LIGHT GAUGE METAL FRAME

0

NOTE(S)

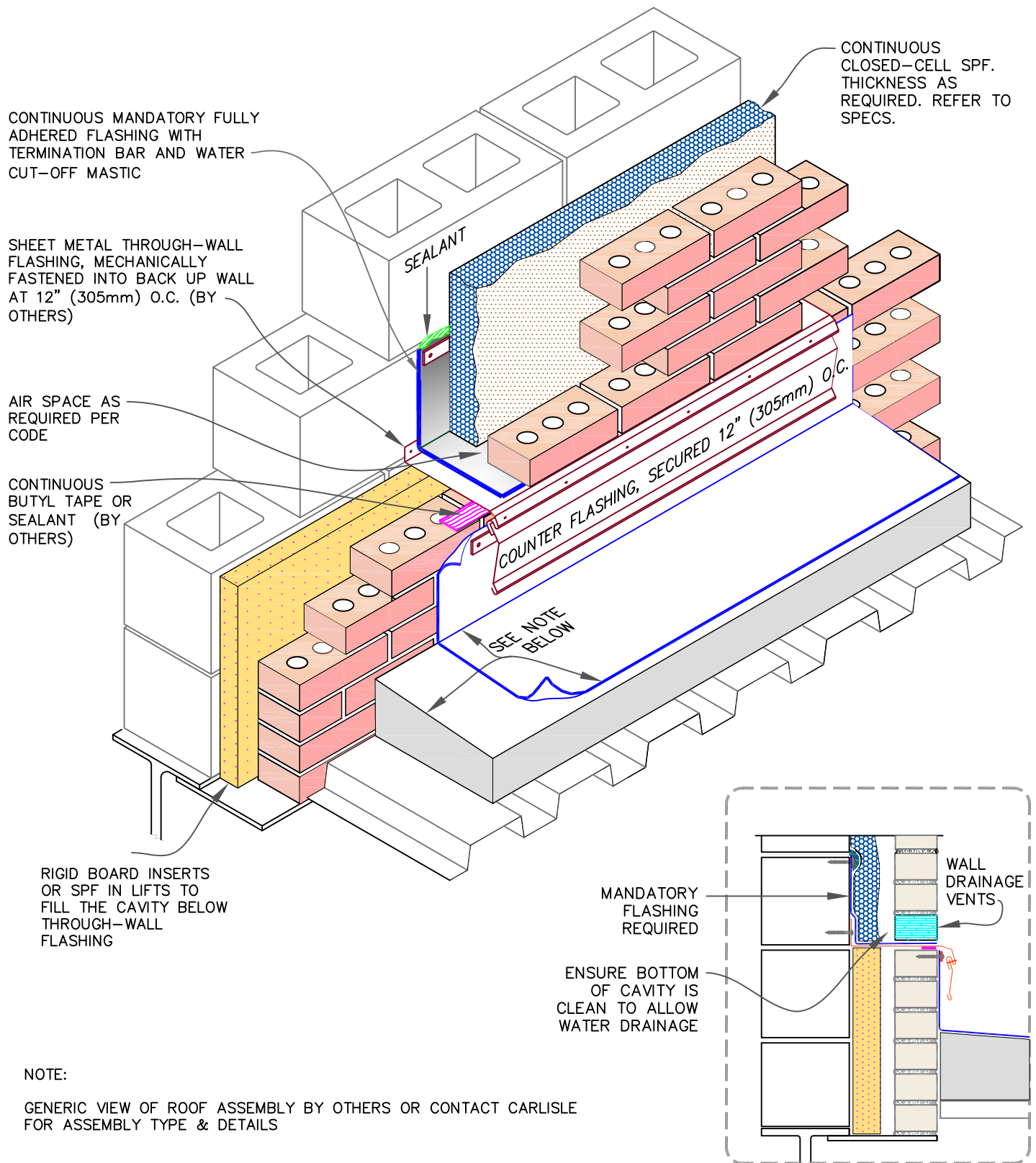


SPRAYED POLYURETHANE FOAM

## PARAPET WITH ROOF VAPOR BARRIER

1.2

For additional information, refer to Specifications



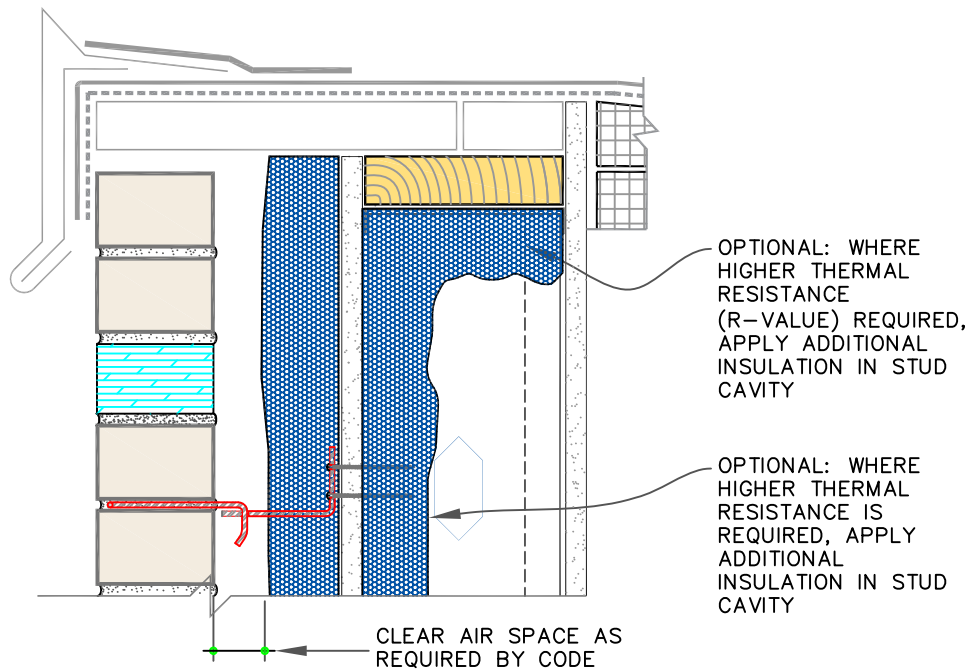
|       |                                     |   |                           |
|-------|-------------------------------------|---|---------------------------|
| SPF   | SPRAY POLYURETHANE FOAM             | 0 | NOTE(S)                   |
| ccSPF | CLOSED CELL SPRAY POLYURETHANE FOAM |   |                           |
| c.i.  | CONTINUOUS INSULATION               |   |                           |
| LMF   | LIGHT GAUGE METAL FRAME             |   |                           |
|       |                                     |   | SPRAYED POLYURETHANE FOAM |

## RISING WALL BETWEEN LOWER ROOF AND UPPER ROOF

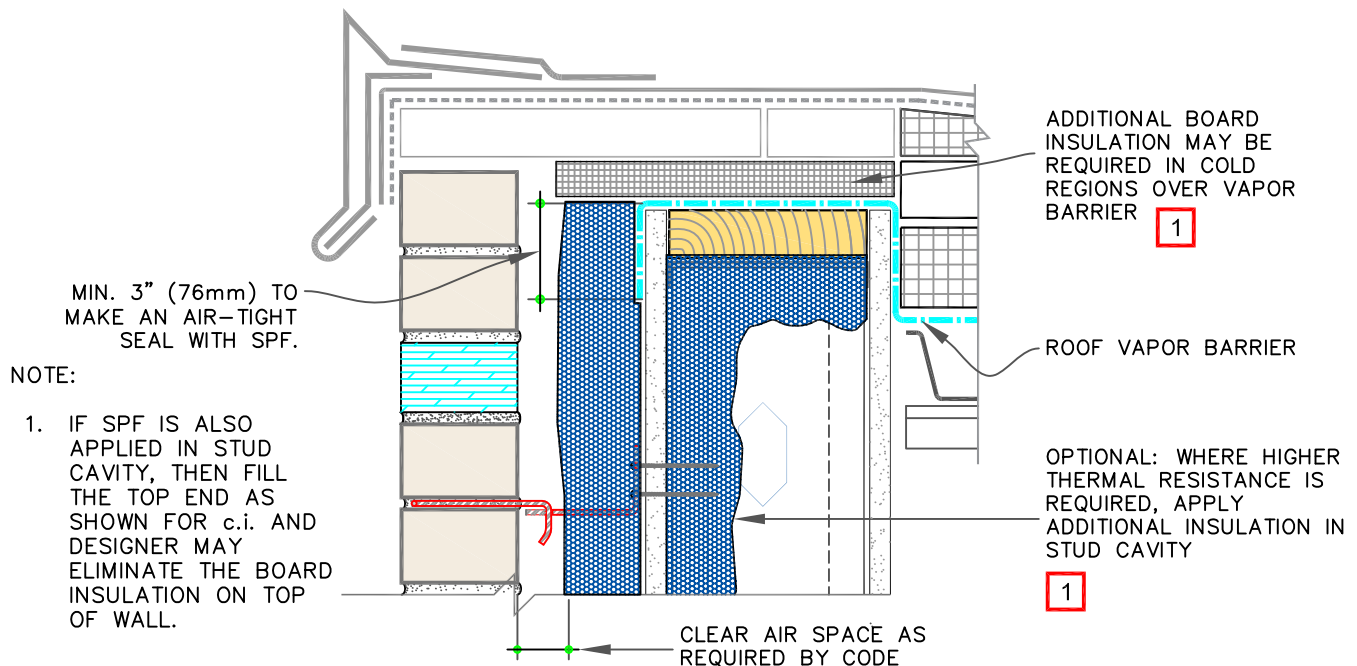
1.3

For additional information, refer to Specifications

## WALL WITHOUT ROOF VAPOR BARRIER



## WALL WITH ROOF VAPOR BARRIER

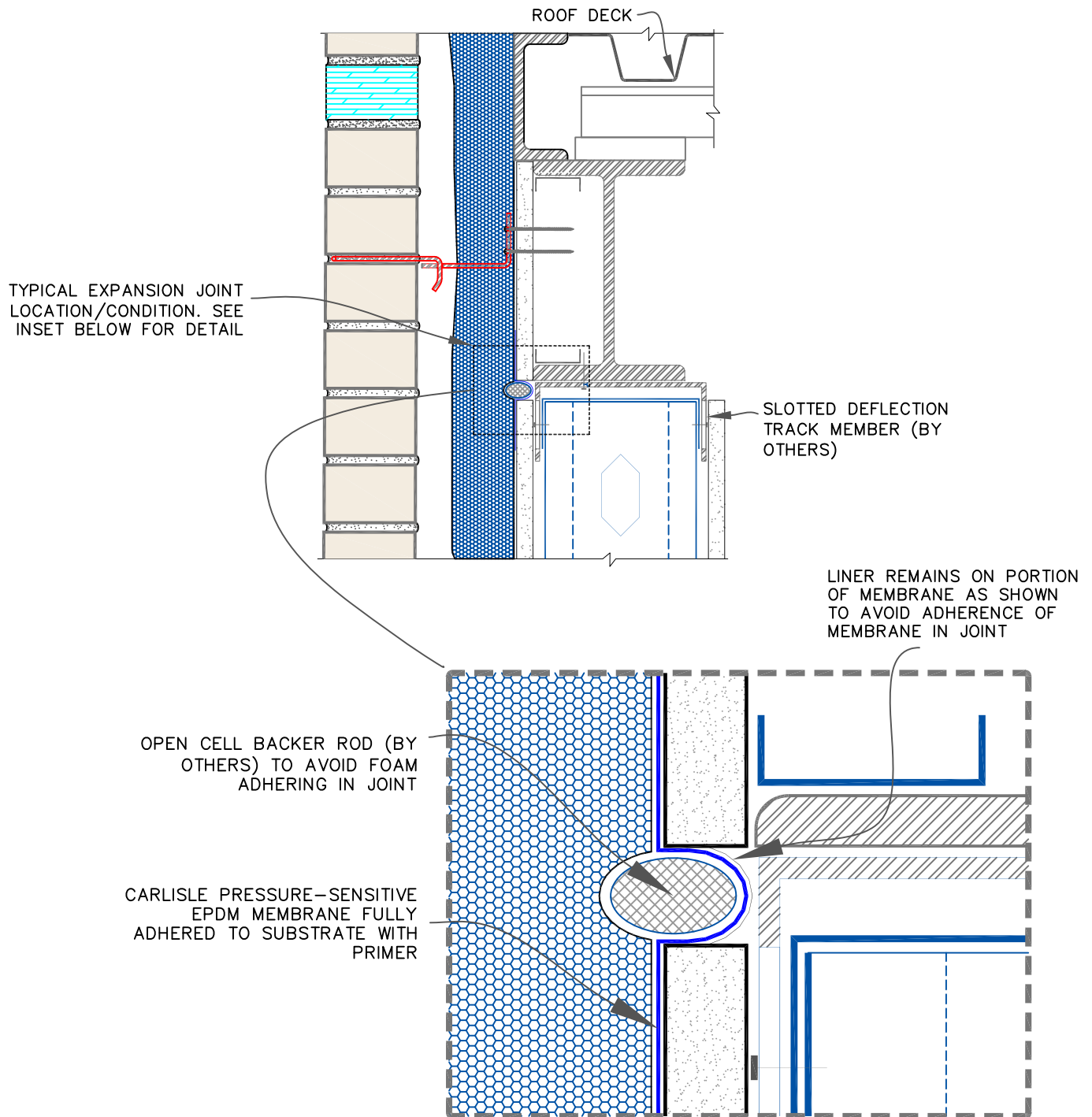


|       |                                     |   |                           |
|-------|-------------------------------------|---|---------------------------|
| SPF   | SPRAY POLYURETHANE FOAM             | 0 | NOTE(S)                   |
| ccSPF | CLOSED CELL SPRAY POLYURETHANE FOAM |   |                           |
| c.i.  | CONTINUOUS INSULATION               |   |                           |
| LGMF  | LIGHT GAUGE METAL FRAME             |   |                           |
|       |                                     |   | SPRAYED POLYURETHANE FOAM |

## ROOF EDGE WITH & WITHOUT ROOF VAPOR BARRIER

For additional information, refer to Specifications

2.1



SPF SPRAY POLYURETHANE FOAM  
ccSPF CLOSED CELL SPRAY POLYURETHANE FOAM  
c.i. CONTINUOUS INSULATION  
LGMF LIGHT GAUGE METAL FRAME

0

NOTE(S)

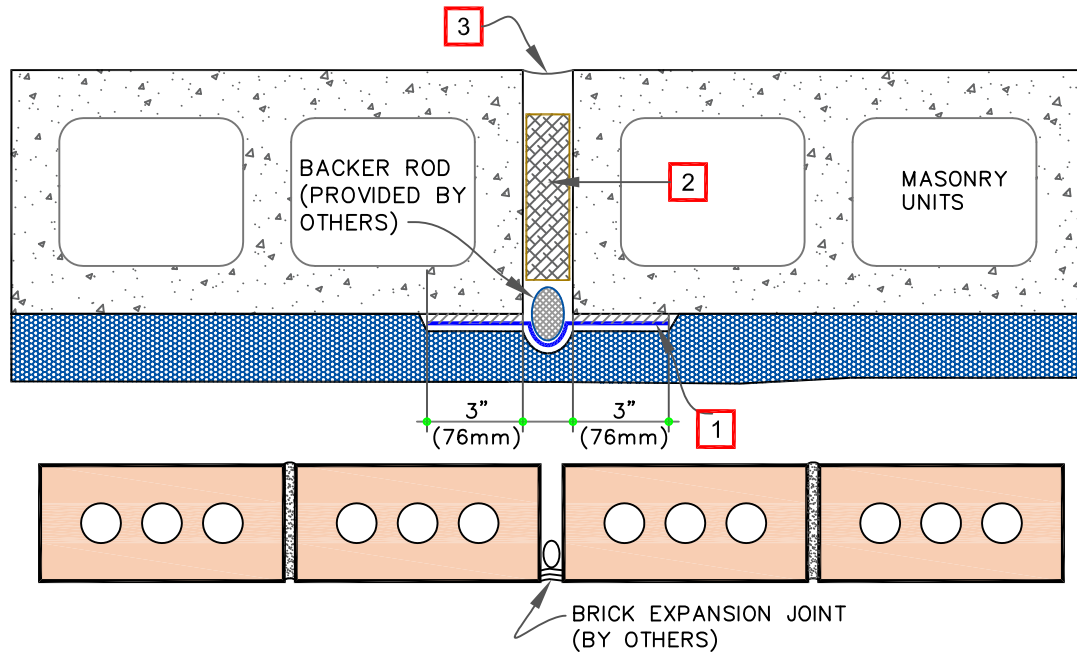


SPRAYED POLYURETHANE FOAM

## EXPANSION JOINT AT DEFLECTION TRACK

For additional information, refer to Specifications

3.1



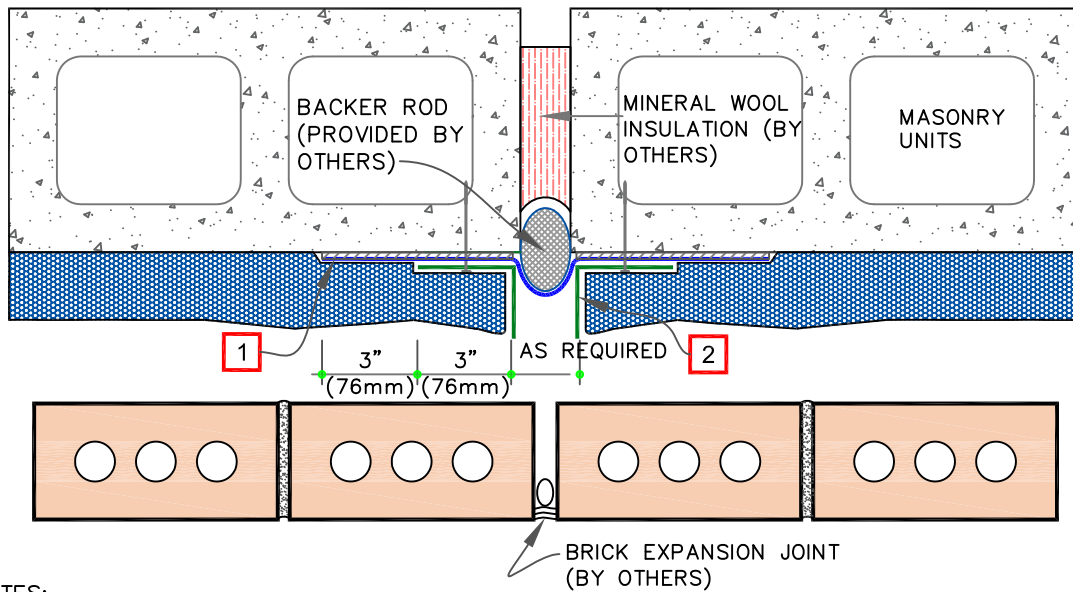
NOTES:

1. CARLISLE PRESSURE-SENSITIVE EPDM MEMBRANE FULLY ADHERED TO SUBSTRATE WITH PRIMER.
2. WOOD FIBER BOARD REQUIRED TO SUPPORT THE BACKER ROD (BY OTHERS).
3. INTERIOR CONTROL JOINT (BY OTHERS).

|   |                                     |                       |                           |     |
|---|-------------------------------------|-----------------------|---------------------------|-----|
|   |                                     | MASONRY CONTROL JOINT |                           | 3.2 |
| SPF   | SPRAY POLYURETHANE FOAM             | 0                     | NOTE(S)                   |     |
| ccSPF   | CLOSED CELL SPRAY POLYURETHANE FOAM |                       |                           |     |
| c.i.  | CONTINUOUS INSULATION               |                       |                           |     |
| LGMF  | LIGHT GAUGE METAL FRAME             |                       |                           |     |
|   |                                     |                       | SPRAYED POLYURETHANE FOAM |     |
| For additional information, refer to Specifications |                                     |                       |                           |     |



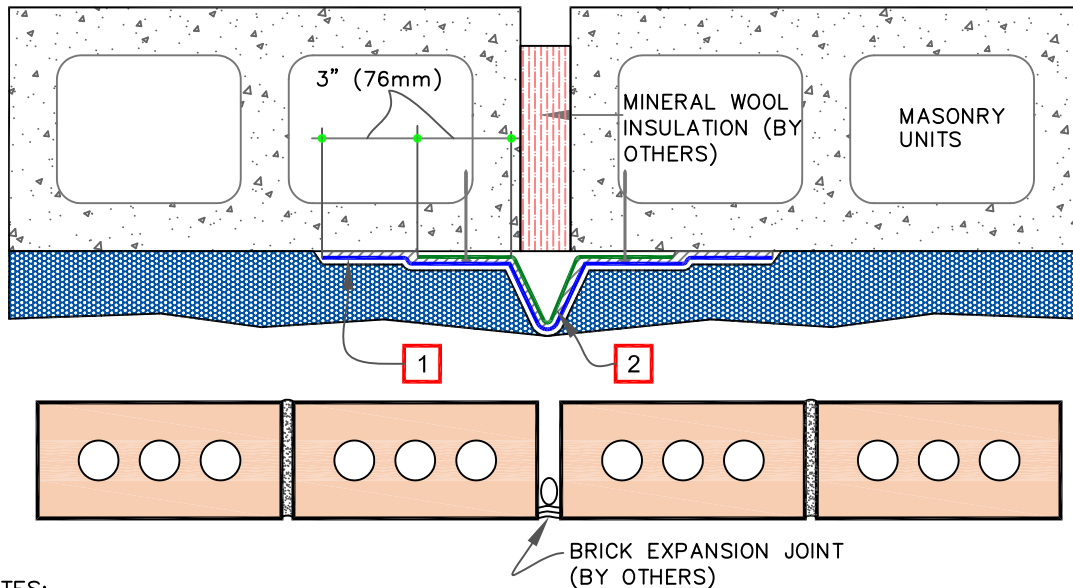
### OPTION A



#### NOTES:

1. CARLISLE PRESSURE-SENSITIVE EPDM MEMBRANE FULLY ADHERED TO SUBSTRATE WITH PRIMER
2. PVC ANGLES MECHANICALLY SECURED INTO SUBSTRATE WALL.

### OPTION B



#### NOTES:

1. CARLISLE PRESSURE-SENSITIVE EPDM MEMBRANE FULLY ADHERED TO SUBSTRATE WITH PRIMER.
2. 16 OZ COPPER OR 26GA STAINLESS STEEL E.J. SECURED @ 12" (305mm) O.C. ON BOTH SIDES.



SPF SPRAY POLYURETHANE FOAM  
ccSPF CLOSED CELL SPRAY POLYURETHANE FOAM  
c.i. CONTINUOUS INSULATION  
LGMF LIGHT GAUGE METAL FRAME

0

NOTE(S)

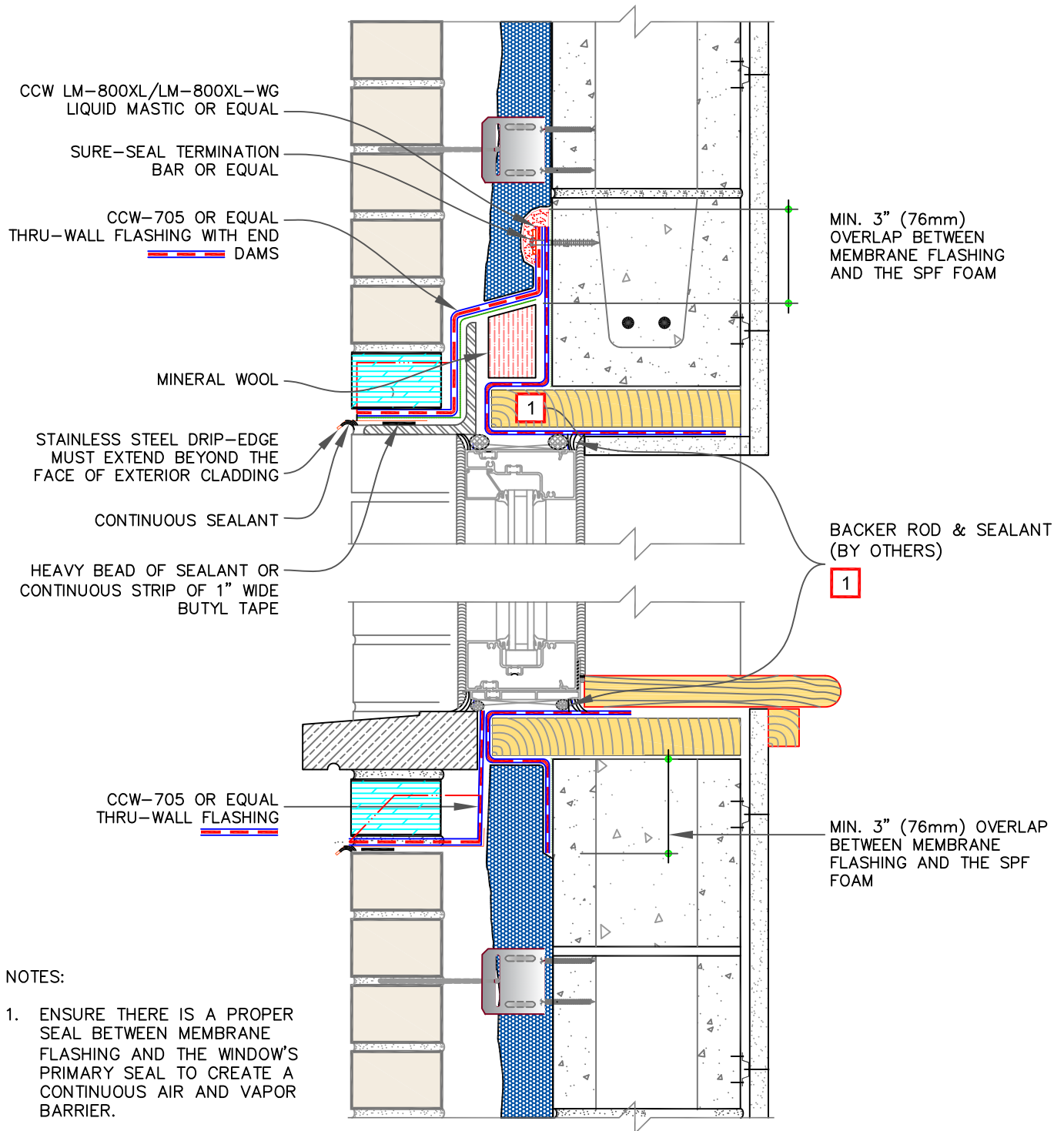
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SPRAYED POLYURETHANE FOAM

## MASONRY EXPANSION JOINT OPTIONS

For additional information, refer to Specifications

3.3



NOTES:

1. ENSURE THERE IS A PROPER SEAL BETWEEN MEMBRANE FLASHING AND THE WINDOW'S PRIMARY SEAL TO CREATE A CONTINUOUS AIR AND VAPOR BARRIER.
2. COORDINATE WITH CARLISLE FOR DIFFERENT WINDOW INSTALLATION CONDITIONS.



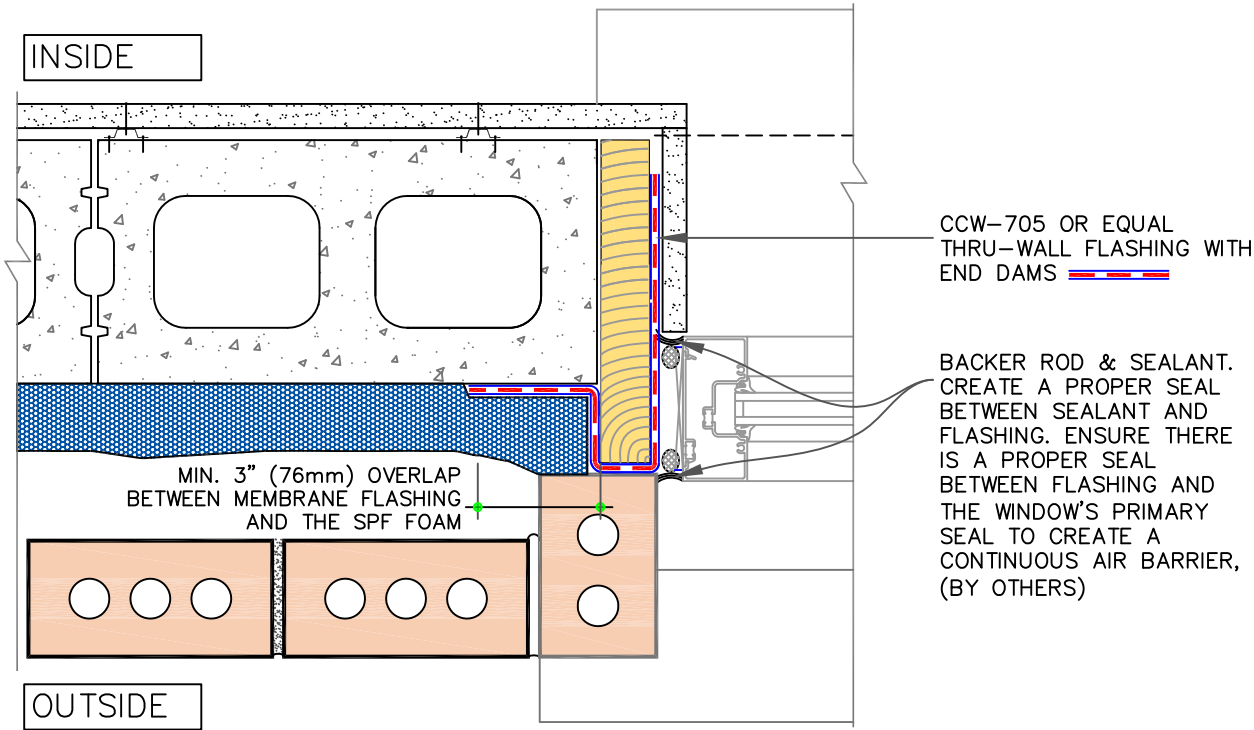
|       |                                     |   |                           |
|-------|-------------------------------------|---|---------------------------|
| SPF   | SPRAY POLYURETHANE FOAM             | 0 | NOTE(S)                   |
| ccSPF | CLOSED CELL SPRAY POLYURETHANE FOAM |   |                           |
| c.i.  | CONTINUOUS INSULATION               |   |                           |
| LGMF  | LIGHT GAUGE METAL FRAME             |   |                           |
|       |                                     |   | SPRAYED POLYURETHANE FOAM |

## WINDOW HEAD AND SILL WITH WOOD BLOCKING IN ROUGH OPENING

For additional information, refer to Specifications

4.1

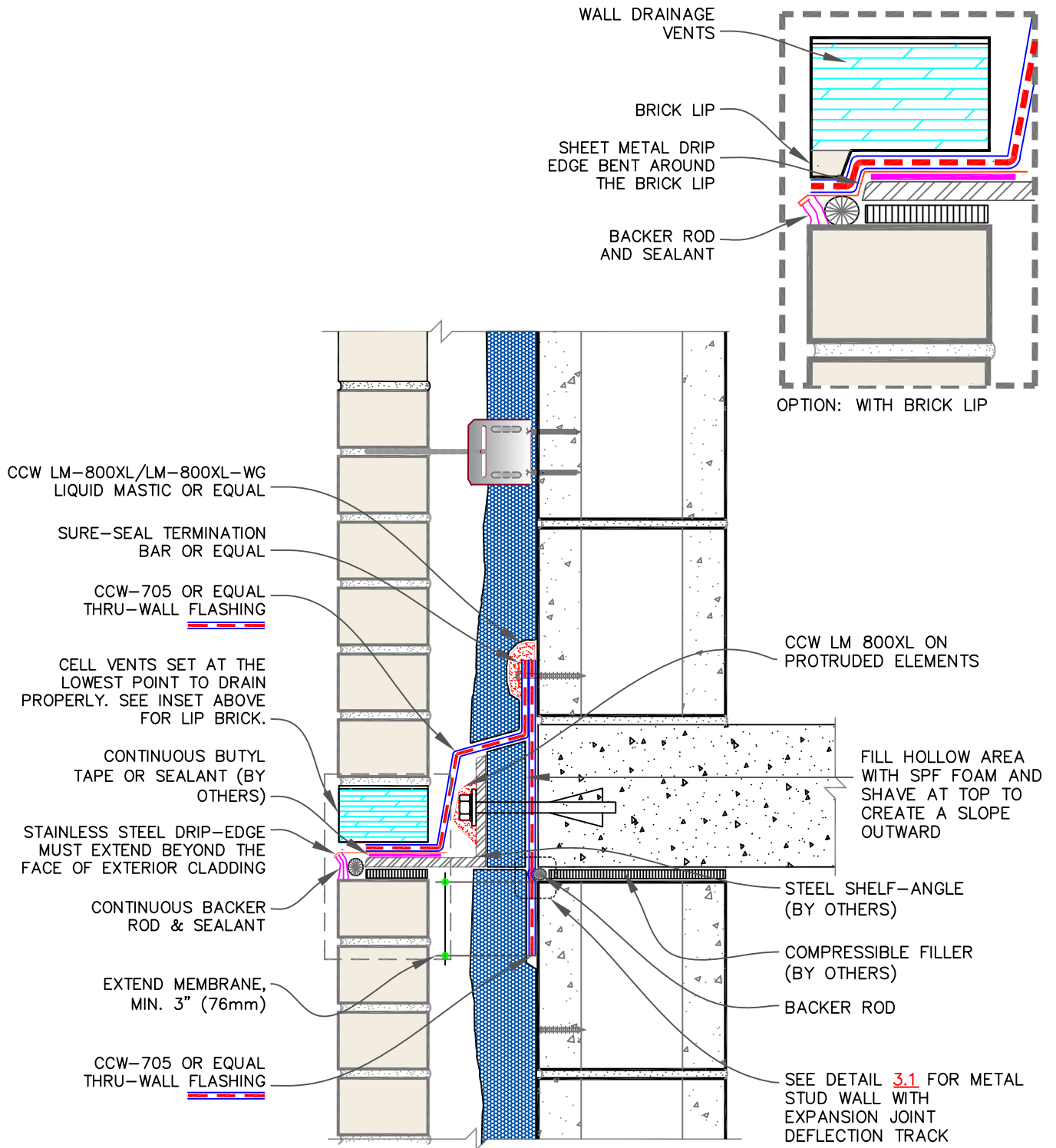




|       |                                     |   |                           |
|-------|-------------------------------------|---|---------------------------|
| SPF   | SPRAY POLYURETHANE FOAM             | 0 | NOTE(S)                   |
| ccSPF | CLOSED CELL SPRAY POLYURETHANE FOAM |   |                           |
| c.i.  | CONTINUOUS INSULATION               |   | SPRAYED POLYURETHANE FOAM |
| LGMF  | LIGHT GAUGE METAL FRAME             |   |                           |

WINDOW JAMB WITH WOOD  
BLOCKING IN ROUGH  
OPENING

For additional information, refer to Specifications

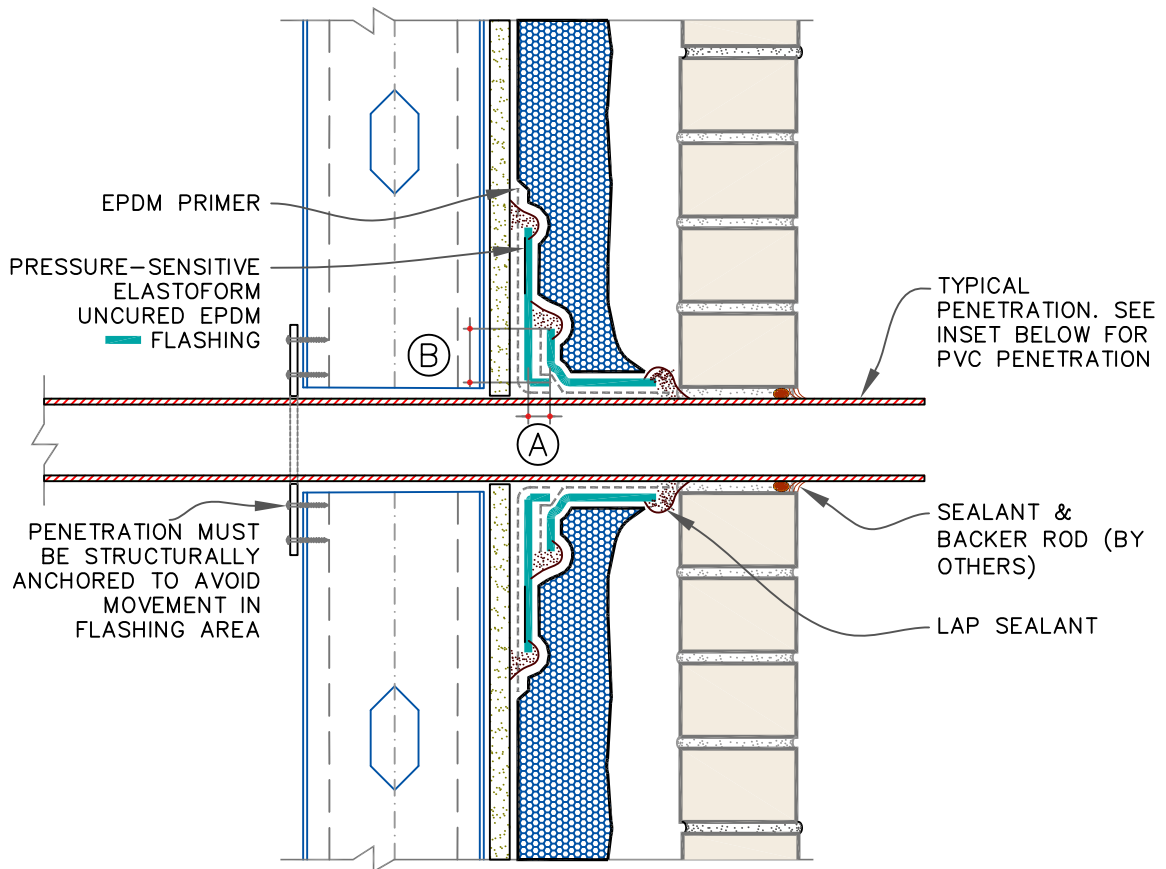


|       |                                     |   |                           |
|-------|-------------------------------------|---|---------------------------|
| SPF   | SPRAY POLYURETHANE FOAM             | 0 | NOTE(S)                   |
| ccSPF | CLOSED CELL SPRAY POLYURETHANE FOAM |   |                           |
| c.i.  | CONTINUOUS INSULATION               |   |                           |
| LGMF  | LIGHT GAUGE METAL FRAME             |   |                           |
|       |                                     |   | SPRAYED POLYURETHANE FOAM |

## SHELF ANGLE

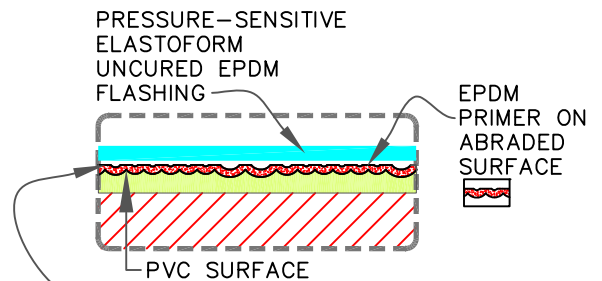
For additional information, refer to Specifications

5.1



NOTES:

1. THIS DETAIL IS APPLICABLE TO OTHER SHAPES, E.G. ROUND/SQUARE TUBES ALSO.
2. FLASHING IS APPLIED TO SMOOTH, SOUND, DRY SUBSTRATES, FREE OF OILS, RUST OR ANY CONTAMINATIONS.
3. IN COLDER TEMPERATURES, A HEAT GUN MUST BE USED WHEN FORMING PRESSURE-SENSITIVE ELASTOFORM OR UNCURED FLASHING.



NOTE:  
ON PVC PIPES / PVC SUBSTRATES, ACHIEVE AN ABRADED SURFACE BY GRINDING WITH COARSE SANDPAPER OR POWERED WIRE BRUSH TO ENHANCE THE ADHESION.

MAGNIFIED PVC SURFACE

| DIMENSIONS |      | mm |      |
|------------|------|----|------|
| (A)        | 1/2" | 13 | MIN. |
| (B)        | 1"   | 25 | MIN. |

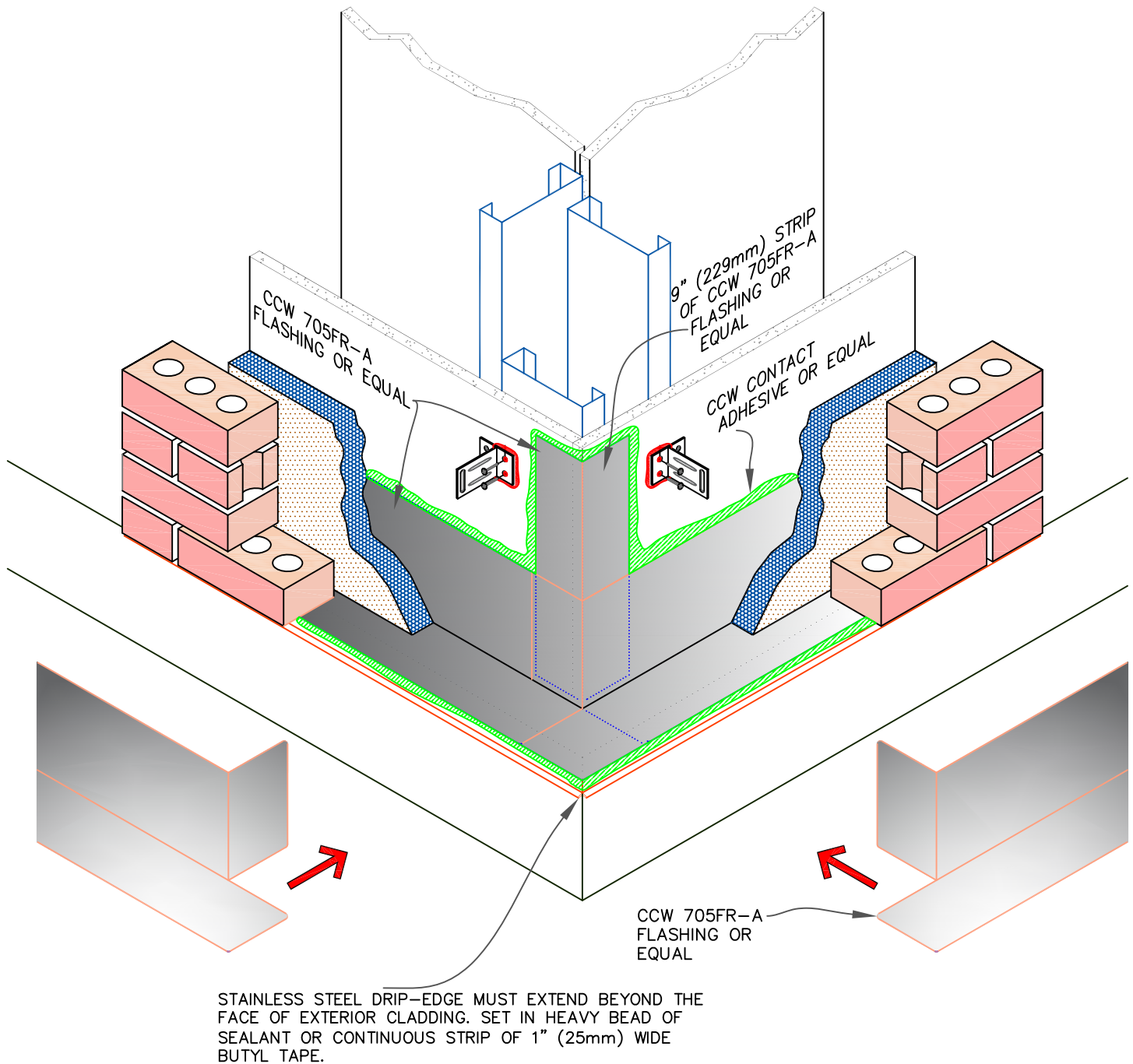


PENETRATION DETAIL

5.2

|       |                                     |   |                           |
|-------|-------------------------------------|---|---------------------------|
| SPF   | SPRAY POLYURETHANE FOAM             | 0 | NOTE(S)                   |
| ccSPF | CLOSED CELL SPRAY POLYURETHANE FOAM |   |                           |
| c.i.  | CONTINUOUS INSULATION               |   | SPRAYED POLYURETHANE FOAM |
| LGMF  | LIGHT GAUGE METAL FRAME             |   |                           |

For additional information, refer to Specifications



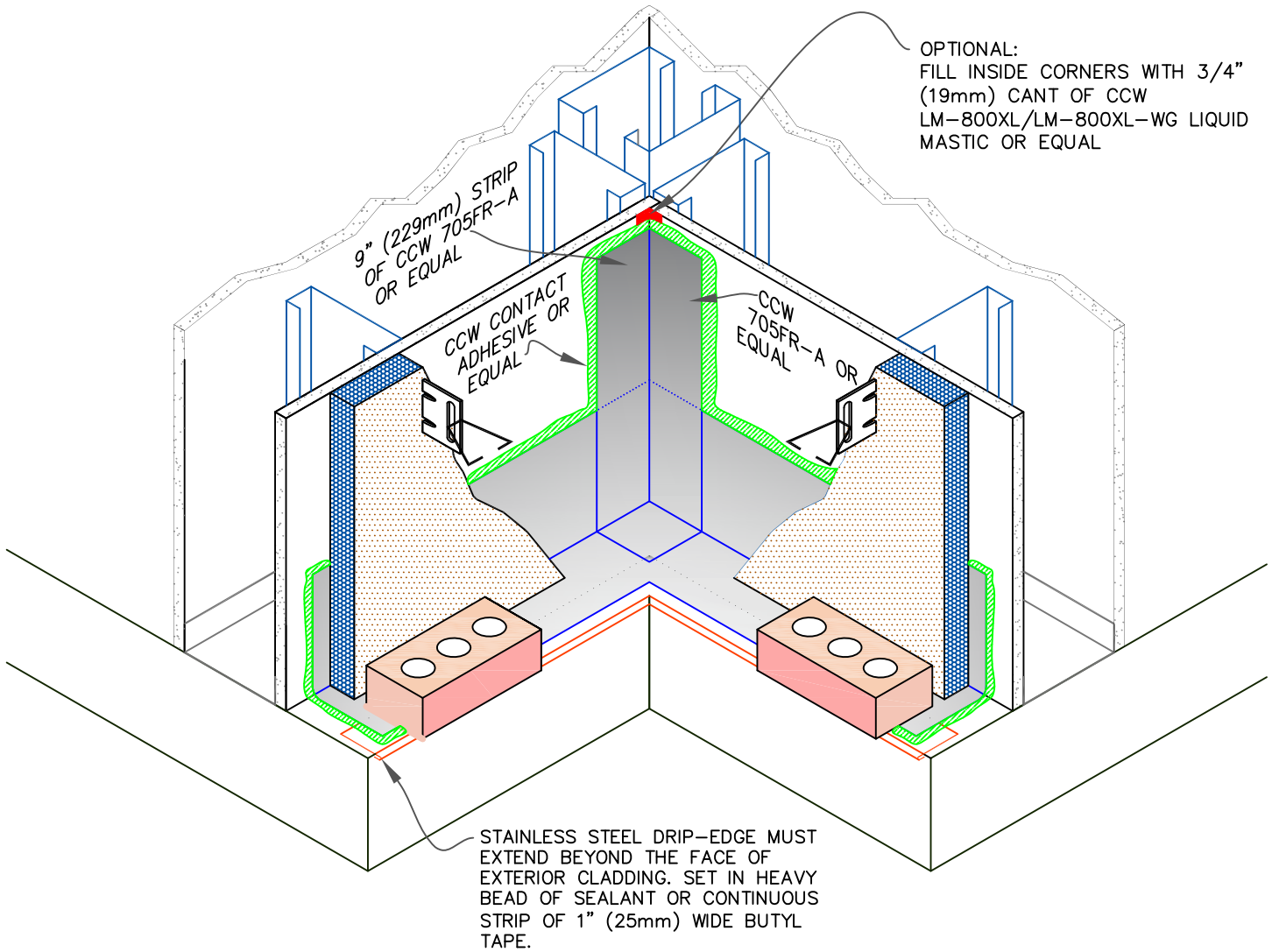
SPF SPRAY POLYURETHANE FOAM  
ccSPF CLOSED CELL SPRAY POLYURETHANE FOAM  
c.i. CONTINUOUS INSULATION  
LGMF LIGHT GAUGE METAL FRAME

0 NOTE(S)  
SPRAYED POLYURETHANE FOAM

## WALL BASE FLASHING AT OUTSIDE CORNER

For additional information, refer to Specifications

6.1



SPF SPRAY POLYURETHANE FOAM  
ccSPF CLOSED CELL SPRAY POLYURETHANE FOAM  
c.i. CONTINUOUS INSULATION  
LGMF LIGHT GAUGE METAL FRAME

0 NOTE(S)  
SPRAYED POLYURETHANE FOAM

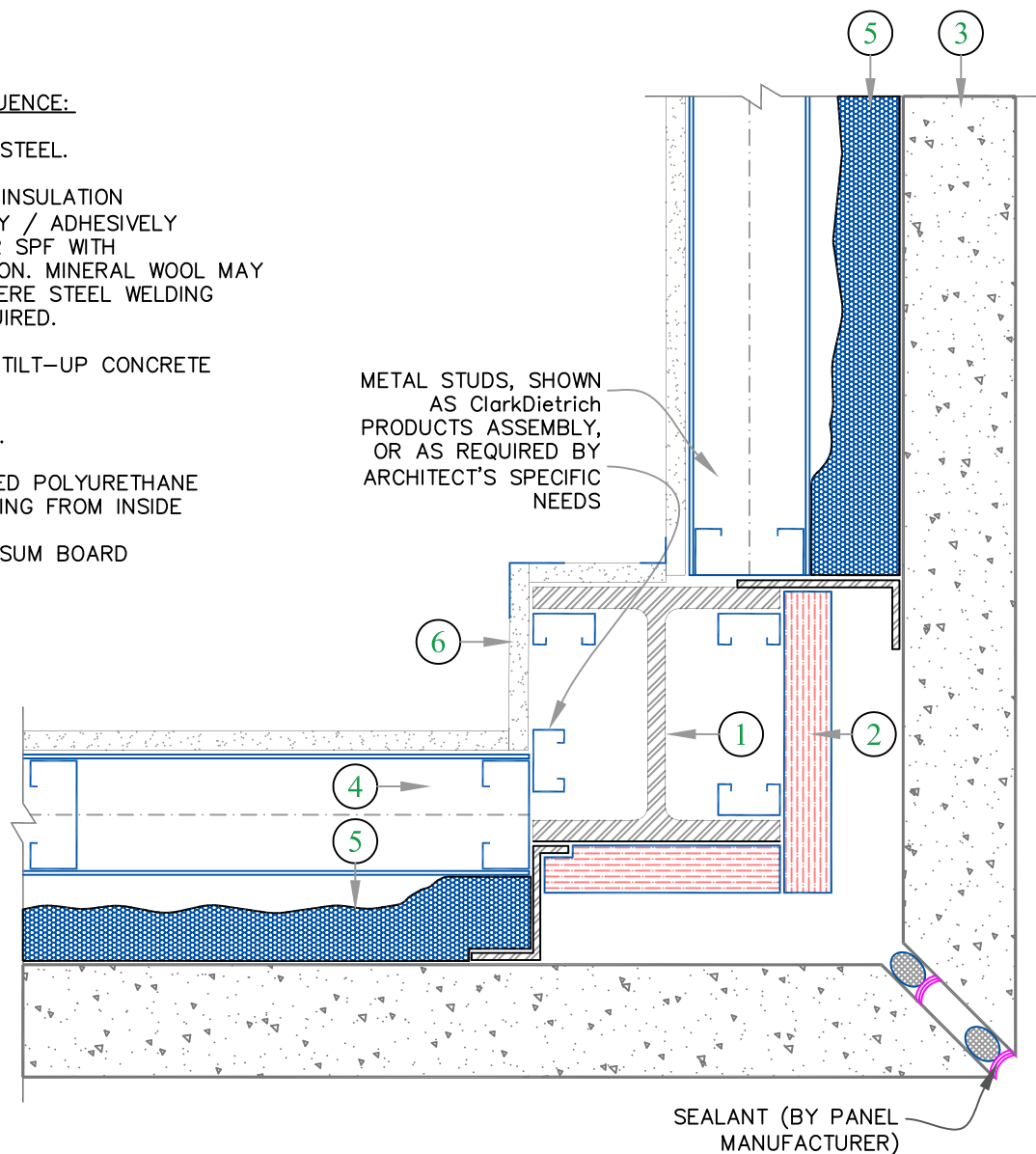
## WALL BASE FLASHING AT INSIDE CORNER

For additional information, refer to Specifications

6.2

INSTALLATION SEQUENCE:

1. STRUCTURAL STEEL.
2. RIGID BOARD INSULATION  
MECHANICALLY / ADHESIVELY  
ATTACHED OR SPF WITH  
UV-PROTECTION. MINERAL WOOL MAY  
BE USED, WHERE STEEL WELDING  
WILL BE REQUIRED.
3. PRECAST OR TILT-UP CONCRETE  
PANELS.
4. METAL STUDS.
5. SPRAY APPLIED POLYURETHANE  
FOAM, REACHING FROM INSIDE
6. INTERIOR GYPSUM BOARD



NOTE:

SAME DETAIL APPLIES TO CONCRETE COLUMNS.



SPF SPRAY POLYURETHANE FOAM  
ccSPF CLOSED CELL SPRAY  
POLYURETHANE FOAM  
c.i. CONTINUOUS INSULATION  
LGMF LIGHT GAUGE METAL FRAME



NOTE(S)



SPRAYED  
POLYURETHANE  
FOAM

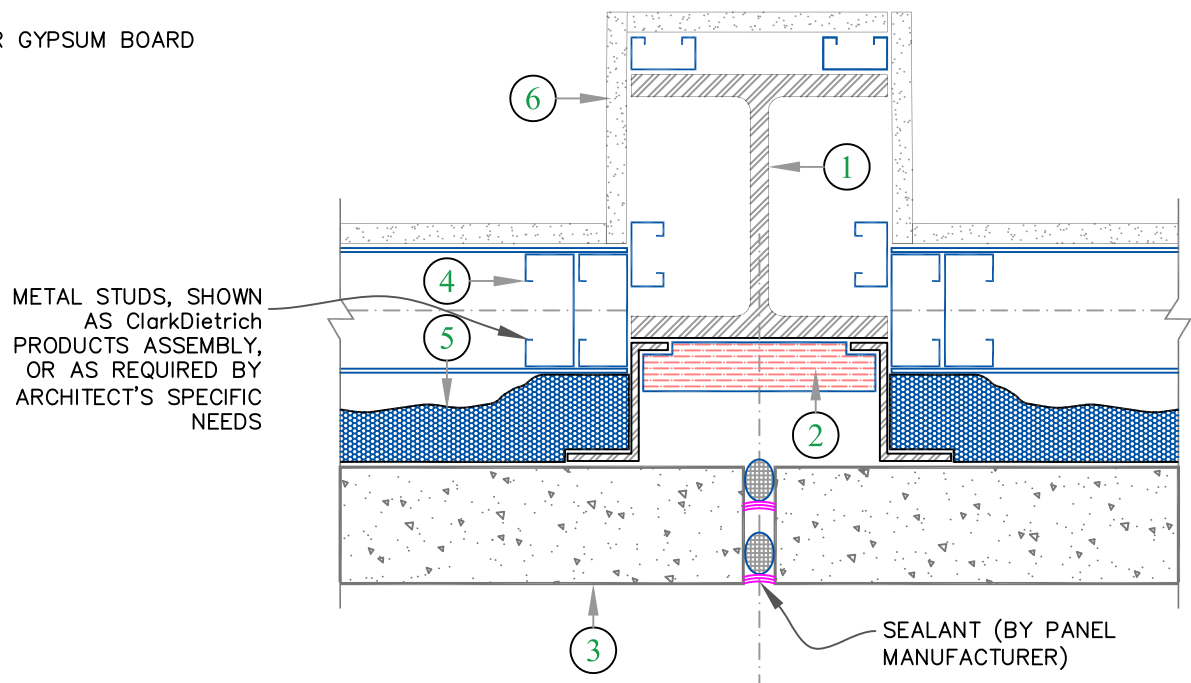
# INSULATION INSTALLATION AT INACCESSIBLE AREAS: H-COLUMN AT CORNER

For additional information, refer to Specifications

7.1



INSTALLATION SEQUENCE:

1. STRUCTURAL STEEL.
2. RIGID BOARD INSULATION  
MECHANICALLY / ADHESIVELY  
ATTACHED OR SPF WITH  
UV-PROTECTION. MINERAL WOOL MAY  
BE USED, WHERE STEEL WELDING  
WILL BE REQUIRED.
3. PRECAST OR TILT-UP CONCRETE  
PANELS.
4. METAL STUDS.
5. SPRAY APPLIED POLYURETHANE  
FOAM, REACHING FROM INSIDE
6. INTERIOR GYPSUM BOARD

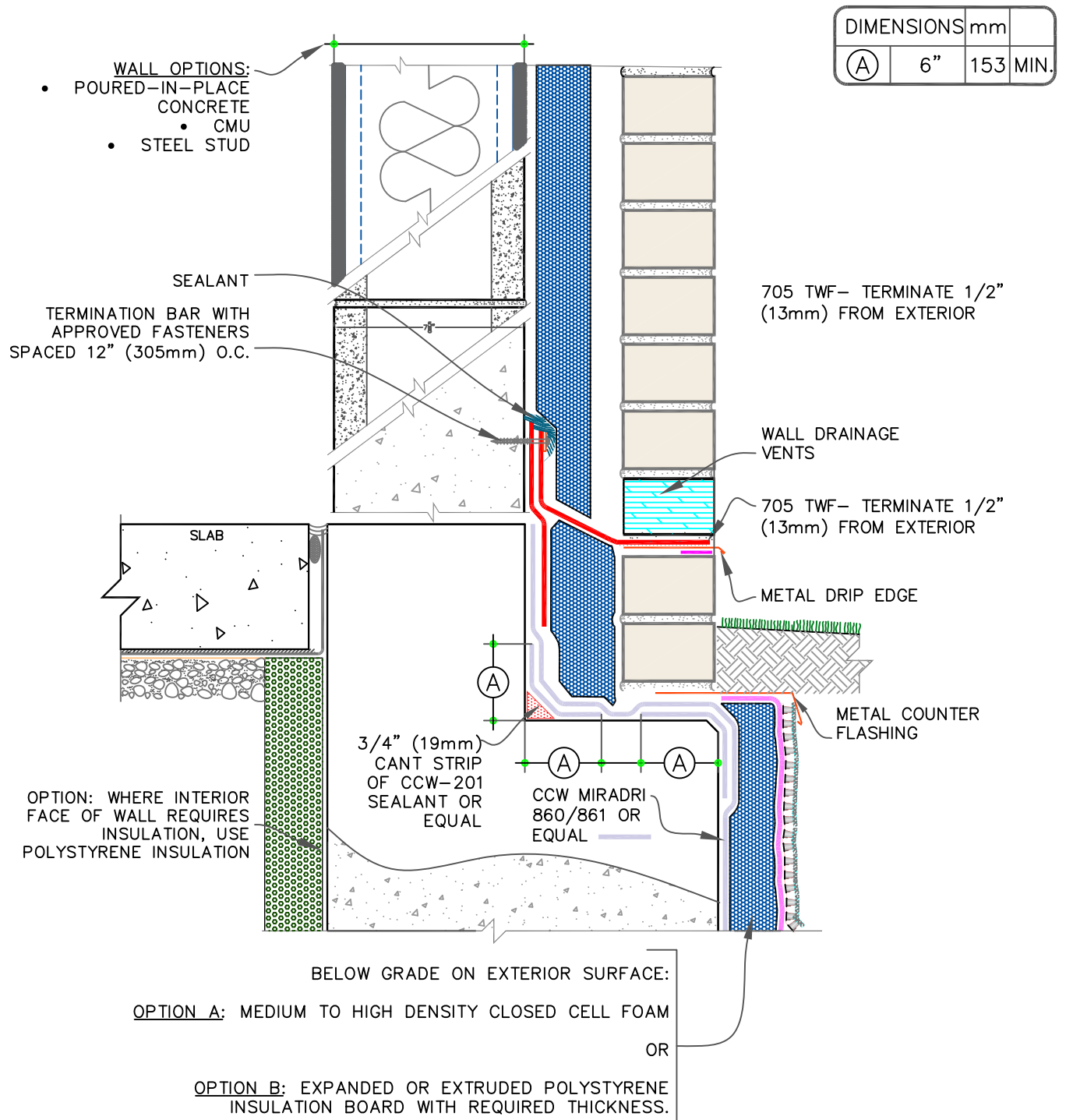


NOTE:

SAME DETAIL APPLIES TO CONCRETE COLUMNS.

|  |   |   |     |
|--|---|---|-----|
|   |   | INSULATION INSTALLATION AT<br>INACCESSIBLE AREAS:<br>H—COLUMN IN WALL | 7.2 |
| SPF SPRAY POLYURETHANE FOAM<br>ccSPF CLOSED CELL SPRAY POLYURETHANE FOAM<br>c.i. CONTINUOUS INSULATION<br>LGMF LIGHT GAUGE METAL FRAME | <div><div>0</div>NOTE(S)<br/>SPRAYED POLYURETHANE FOAM</div> |   |     |
|  |   | For additional information, refer to Specifications                   |     |





SPF SPRAY POLYURETHANE FOAM  
ccSPF CLOSED CELL SPRAY POLYURETHANE FOAM  
c.i. CONTINUOUS INSULATION  
LGMF LIGHT GAUGE METAL FRAME

0 NOTE(S)  
SPRAYED POLYURETHANE FOAM

## WALL TO BELOW GRADE JUNCTION FOR NON RESIDENTIAL STRUCTURE

For additional information, refer to Specifications

8.1